DEVELOPING A CAREER AND TECHNICAL EDUCATION (CTE) PROGRAM:

MARINE BIOLOGY RESEARCH SELF STUDY

AUTHOR: MAURICIO GONZALEZ, M.Sc.

ADVISOR: EDWARD BIEDERMANN, Principal

(With Harbor "Field" Class by Ann Fraioli and Jeremy Lynch)

URBAN ASSEMBLY NEW YORK HARBOR SCHOOL

NEW YORK

2013

Career and Technical Education Program

Self-Evaluation Form

Deadline: Monday, December 3rd, 2012

Revised September 2012

Name of School:	Urban Assembly New York Harbor School
School address:	Battery Maritime Building, 10 South Street, Slip 7, NY, NY 10004
DBN:	02M551
Principal Name:	Edward Biedermann
Principal e-mail:	ebiedermann@nyharborschool.org
Principal's contact number:	212.458.0800
CTE Program Name:	Marine Biology Research Program
Program CIP code:	030205
Proposed program start date: Year program will apply for approval	2013
CTE Contact Name:	Edward Biedermann
CTE Contact Number:	917.409.5000
CTE Contact e-mail address:	ebiedermann@nyharborschool.org

Please note:
This form is required for non-approved programs and for programs that require re-approval. Failure to report program information may result in a loss of VTEA funding.

Section A: How to use this form

This self-evaluation form must be completed for schools seeking New York State Program Approval for their CTE program(s). It is designed to assist you in your own self-evaluation for submission to the New York City Department of Education (NYCDOE) CTE team. When this form is submitted, CTE team members will examine its content and decide if the findings are convincing, likely to meet the required standard and therefore warrant an external review visit to assess and confirm your evaluations.

Current Program Status	Use if
Non-approved moving toward approval	• You submitted an LOI but did not submit a SEF during SY 2011-12 **OR** • Your program is in years 2-3 of operation **OR** • Your program is going to have its first graduating class and you did not submit a SEF in SY 2011-12
Re-approval required	• Your program has ***lapsed/expired*** prior to 2012 and you submitted the LOI during SY 2011-12 **OR** • Your program has ***recently*** expired in June 2012 and you submitted only the LOI during SY 2011-12

This form is in four parts:

Section A **Guidance on how to use the form**

Section B **Self-evaluation of the quality of the CTE program**

Section C **List of supporting documents**

Section D **Data Tables and Program Development Plans**

THIS SECTION IS A SEPARATE DOCUMENT CONTAINING THE FOLLOWING ITEMS:

- Data Tables 1-7
- Program Development Plan *(all programs)*
- Re-approval program data ***(Re-approvals only)***

Sections A and B, C, and D should be emailed to cteprogramapproval@gmail.com

The self-evaluation form is a summative document, intended to record the outcomes of your on-going process of rigorous self-evaluation in Section B. When completing Section B of this form, school evaluators should be guided by the Evaluation Schedule, noting the following:

- When completing this form, respond to the questions provided to ensure that you have fully evaluated the component
- You should begin each section with your judgments of overall quality by placing an X in the box that best fits your judgments. Be sure to refer to the relevant Quality Indicators (QIs) that are set out at the end of each component section in the Evaluation Schedule to guide your judgments

To help ensure that your self-evaluation form narrative is convincing, you should make clear what evidence has been used to make the evaluation and indicate where, upon request external evaluators can review the evidence. It is not necessary to describe the evidence in great detail but it should be accessible for review.

The narratives for each of the five components of the program evaluation schedule should be consistent with and explain the judgments that you insert at the beginning of each section. It should also represent the collective agreement of the self-study team and have been approved by them. Section C of the self-evaluation form provides a list of the factual information required to accompany the application.

SECTION B: Self-Evaluation of Quality of the CTE program

School and CTE program Context

Outline the proposed CTE program of Study, explain what students are expected to achieve by the time they finish their studies and how the program meets a demand.

The failure of our urban public schools to produce scientifically literate college bound teenagers reflecting city demographics is well known. Equally disturbing is the lack of representation and participation in STEM (Science, Technology, Engineering and Math) of ethnic groups who are over-represented below the poverty line. Our nations research institutions and private engineering firms increasingly look outside our borders to recruit and hire competent scientists. This program will focus on changing these trends and connect our youth to the skills and knowledge necessary to be competitive in college and enter the STEM fields. The vehicle for this transformation will be student-formulated, problem-based projects that aim to restore NYC's marine resources.

The Marine Biology Research Program is a 3 yr. program that will jump start high school students in core marine science topics employing hands-on, problem-based learning strategies. Students will begin by building and studying simple aquatic ecosystems; formulate experiments with these systems; learn the biology, chemistry, physics, and ecology behind them; and apply basic instrumentation techniques to monitor them. Once these sets of "in house" skills have been mastered, the program will then shift students' attention to the natural ecosystems around Governor's Island through the formulation of projects around 3 main topics: oyster restoration, habitat characterization, and water/air quality monitoring with a student built and maintained network around the Hudson River Estuary. Students will learn how to formulate projects, submit professional reports, present at national and international research fairs (e.g. Intel Science and Engineering Fair), and, ultimately, use their own data to propose resource management solutions to local government agencies. Upon satisfactory completion of this program students will also be eligible for ***12*** college credits, Geographic Information System map-making ***SPACE*** certification, Natural Resources Systems Management certification, and other professional opportunities that will give them a competitive advantage in college and industry.

Curriculum and Instruction

C1 Program Objectives and Expectations

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality *(additional to meeting standard)* ☒	• Program objectives are well established, challenging, and well-matched to student needs. They are routinely and proactively shared with students, parents, and teachers and linked closely to course plans and their review.
Meets standard ☐	Program has clear objectives and high expectations that are: • aligned with the school's mission, • appropriate for its target population, and clearly defined for students, parents, teachers, and school community • integrates postsecondary career and education expectations
Under-developed ☐	• Program objectives do not communicate high expectations and do not meet the full range of intended students' needs. Links to the scope and sequence of courses within the program are patchy.

Directions: Please provide documentation for item 1 as indicated in section C List of supporting documents. For item 2 please provide a narrative response.

C1 Program Objectives and Expectations

Supporting Document(s) Required:

- **Course Documentation:** course descriptions, syllabi, or documents which make reference to the program objectives and expectations.

1. What are the programs' objectives and expectations?
   Please provide the supporting documents in place of a narrative for this item as indicated in section C.

01. Prepare students for resource management and conservation.
02. Give students a rigorous foundation in marine science.
03. Expose students to professional settings and careers in marine science.
04. Prepare students for college with rigorous research projects and college credit bearing courses.
05. Train students to use cutting edge technology (e.g. remote sensing equipment and Geographic Information Systems).
06. Characterize Governors Island's marine environment and support the Oyster Restoration Project.

2. How are the objectives and expectations shared with students, parents, teachers and the school community?

The curriculum objectives are well established, challenging, and well matched to students needs. They are routinely shared with all stakeholders.

The curriculum crosswalk, aims, objectives, and plans are available on the program's web page http://harborseals.org/sample-page/ and on School Press releases (i.e.https://app.e2ma.net/app/view:CampaignPublic/id:30249.11007808736/rid:a8955582c96304c4ed68d01315f789d8)

All Course materials and lessons will be posted on the Harbor SEALs web site (www.harborseals.org). Most of the 10th grade Introductory Marine Research Class is already live.

C2 Program Sequence of Courses

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality *(additional to meeting standard)* ☒	• Program has demonstrated itself to be comprehensive and very well-planned and sequenced so that courses build systematically on students' knowledge and skills over, at least, two years. • Students' varied activities and challenging work, including: access to an extensive range of work-based learning activities that meet the full range of students' needs and aspirations and promotes a deeper understanding of the career field and industry.
Meets standard ☐	• Program has a coherent sequence of courses that is scaffolded, non-duplicative, and requires at least 2 years for completion. • Learning experiences for students encompass a variety of activities and resources—including work-based learning—to link both academic knowledge and technical skills. • A Career and Financial Management course, taught as an integrated or stand-alone course of study, is part of the sequence.
Under-developed ☐	• Program courses exist in outline but are not fully scaffolded and/or adequately sequenced to enable students to build on their knowledge and skills systematically. • There are some sequences of work where student experiences are limited by a lack of resources and/or work-based learning which inhibit their acquisition of knowledge and skills. • A Career and Financial Management Course is not established

Directions: Please complete table 1 in section D for items 1 and 2. This indicator requires documentation in place of a narrative response.

C2 Program Sequence of Courses

Supporting Document(s) Required:

- **Program Course Sequence (Table1)** in section D of the self-evaluation form.

1. Provide a coherent sequence of courses that is scaffolded, non-duplicative, and requires at least 2 years for completion.

Introductory Marine Research I (five single periods/week)

Introductory Marine Research II (five single periods/week)

Intermediate Marine Research I (two triple periods/week; total = 6 periods/week)

Intermediate Marine Research II (two triple periods/week; total = 6 periods/week)

Advanced Marine Research I (two triple periods & one double period/week; total = 8 periods/week)

Advanced Marine Research II (two triple periods & one double period/week; total = 8 periods/week)

All courses run on a semester calendar.

Summer Marine Research Courses are only eligible for college credit at the moment. We are working to figure out how to also attach high school credit to them.

2. Is the Career and Financial Management course taught as an embedded or stand alone course of study?

☐ Stand alone ☒ Integrated

C3 Curriculum Alignment with State/Industry Standards

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☒	• The curriculum and course sequence is fully aligned with both NYS Learning and other core academic standards and with industry-based competency standards on completion, with clear mapping of links between course components and these standards.
Meets standard ☐	• Curriculum and course sequence is aligned with NYS Learning Standards (English Language Arts, Mathematics, Science, Social Studies, and Career Development and Occupational Studies) and other core academic standards. • Curriculum is also aligned with industry-based competency standards that students are expected to know at the conclusion of their studies.
Under-developed ☐	• Some elements of the curriculum and course sequence are aligned with academic or NYS Learning Standards but there are significant gaps. • The curriculum meets some industry-based competency standards expected by the end of the course of study but there are significant elements that are not yet covered or not fully integrated into the program.

Directions: Please provide the curriculum crosswalks for each course as indicated in section C List of Supporting Documents for item 1. Item 2 requires a narrative response.

C3 Curriculum Alignment with State/Industry Standards

Supporting Document(s) Required:

- **Curriculum-Standards Crosswalks** (for all courses including CFM)

1. Are all course curricula aligned to the New York State, Common Core, and Career Development Occupational Standards to ensure that students acquire the skills and competencies required?
Please provide the supporting documents in place of a narrative for this item as indicated in section C.

Common Core Standard	☒ Yes	☐ No
New York State Standards	☒ Yes	☐ No
CDOS standards	☒ Yes	☐ No

We are currently working to align each individual lesson to the Common Core and New York State Standards. Most individual lessons align with all three Standard categories.

2. How was the curriculum selected or developed for this program? How is the curriculum aligned to industry-based competency standards?

All aspects of the curriculum have been cross referenced with the three Standard categories and have been endorsed by various universities and associated industries. It was designed based on industry experience but with the basics in mind. Industry content was extracted from a series of text books and field books in the area of study. Drafts of the curriculum have been submitted to Professional Advisory Committee members from partnering universities and Industry for commenting. Letters of endorsement are attached. All three Standard categories have been made explicit in the curriculum map.

Additional information of the standards of the Geographic Information Systems Certification which will serve as the practical assessment component of the program can be found at:

http://www.digitalquest.com/certification.html?panel=1
Additional information of the standards for the Natural Resources Systems Certification which will serve as the theoretical assessment component of the program can be found in http://www.nocti.org/PDFs/JobReady/1228_Natural_Resource_Systems.pdf

C4 Qualified Faculty

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☒	• Course teachers and leaders are state certified, highly effective, and have extensive industry experience and connections relevant to the program taught.
Meets standard ☐	• Program courses are taught by state-certified teachers with expertise of specific CTE program based upon industry experience and certification.
Under-developed ☐	• Some or none of the staff are state-certified to teach CTE programs and may not have specific expertise, pertinent industry experience, or certification required for the program.

Directions: Please complete table 2 in section D for items 1-3.
Item 4 requires a narrative response.

C4 Qualified Faculty

Supporting Document(s) Required:

- **List of CTE certified program teachers and work-based learning coordinator (Table 2)** in section C of the self-evaluation form
- **Copies of each teachers NYS CTE certification including the work-based learning coordinator's extension certificate** (WBL coordinator must also hold a valid CTE certification)
  Screen shots printed from the NYS Office of Teaching Initiatives or the TEACH website are acceptable.
  http://eservices.nysed.gov/teach/certhelp/CpPersonSearchExternal.jsp?trgAction=INQUIRY

1. Are all of the teacher(s) state-certified with expertise in the specific industry area aligned to the CTE program? ☒ Yes ☐ No

2. Are there currently teachers on staff with temporary certifications? ☒ Yes ☐ No
   If so please list the teacher, their area of certification and the status of their temporary certification.
   (Please provide copies of their applications for extensions and or professional certification as indicated in section C.)

3. Does the work-based learning coordinator hold the extension certificate from NYSED?
   ☐ Yes ☒ No

I plan on taking the required course work to become a WBL Coordinator starting in January with Buffalo State University. The school currently does not a have a coordinator with updated credentials.

4. If your program collaborates with external programs to support work-based learning provide a brief description of the structure currently in place.

There are various programs and institutions that have a MOU with either the program directly or with

the school in the Natural Resources Management field. Those with a direct link to the program send the program coordinator registration information or the coordinator reaches out directly with them to set up WBL internships and experiences for the students. Those with a more general link to the school provide registration information through the College Office where there is a specialist who reaches out to me to offer these opportunities. Students that qualify and show interest are given an application to register that requires a series of documents e.g. working papers, copy of SS, Internship Plan, etc. Students are then put through an interview process by either the program coordinator or the offering institution. Approval signatures are then obtained and schedules are determined. Once at the site, students are required to complete a series of tasks as outlined in the Plan and must keep a weekly journal. Students are encouraged to use their experience to gather data for a long term research project that will allow them to apply for college credit. Students that choose this path will present their research in the school's science symposium.

C5 Preparing Students for Program's Technical Assessment

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☐	• The curriculum is highly effective in enabling students to master needed skills and knowledge for the respective program of study's industry technical assessment, as shown by a record of success.
Meets standard ☒	• Content and scope of curriculum prepares students to master the program's technical assessment and pursue a variety of postsecondary options within the given industry**.**
Under-developed ☐	• A significant proportion of students do not take program's technical assessment or do not pass the exam.

Directions: Please provide narrative responses to items 1-6 below.

C5 Preparing Students for Program's Technical Assessment

1. Is the coursework progressive and sequential?

Yes, the course work is not only these but very demanding so as to realistically prepare students for a career in STEM.

2. How does the coursework help students master the technical assessments and/or earn industry credentials?

The coursework covers most of the topics in the technical assessment either through direct teacher led instruction or through student led experiential learning opportunities interspersed throughout the sequence of study. Though the program meets the needs for the theoretical assessment, it currently does not have the necessary materials to meet the practical assessment in Geographic Information Systems, SPACE. Due to the costly nature of these materials, more time and/or resources are required to obtain these materials. We have included this in our Development Plan. It must be noted that not all students will take the SPACE exam. Only students who have not developed their Independent Research project will take the SPACE GIS assessment. We propose using the completed Independent Research Project, participation in at least 3 STEM fairs, and obtaining college credit as the main vehicle for completing the practical portion of the assessment requirement. The reasoning is that in order to complete the previous, the level of work must be practical college/industry level since it is being conducted with the aid of a research scientist at a research institution or equivalent. This gives students 2 points of entry into success in my program: those who can master the college level independent research component and those that

are more apt for a teacher led, procedural type approach such as that provided by GIS. To illustrate this better, this year, the seniors who fell behind in their independent research project during their junior year have been very successful with the GIS sequence while those that kept up with the independent research component have won 1st place in regional competitions and plan on competing in the New York Science and Engineering Fair and Intel this round for scholarship money and recognition. This is a strong example of multiple entry points for the various levels of student achievement in the MBRP.

3. How are students being prepared for the technical assessment?

The program is scaffolded with theoretical classes and hands-on experiential projects that are long term. Throughout the program the students are building upon prior knowledge and applying these skills to a real-life project. This affords them the experiences and knowledge necessary in Natural Resources Management. In addition, students are given study guides and formative assessments/projects throughout the year.

01) Research Report – Students will receive step-by-step guidance to complete a research project and communicate the various stages of this work orally and written throughout the three years of the program's duration,
02) Journal style article – Students will learn technical reading and writing skills and the American Psychological Association style throughout the 3 years in the program to format a journal article of their research,
03) Research portfolio – Students will be required to keep a portfolio of their research progress and exemplary work including drafts and literature summaries which will be evaluated 3 times during the academic year,
04) Project defense – Students will be required to present their research work at various stages of development in order to gain the confidence required to present their project results in front of a professional audience,
05) NOCTI exam – Students will be required to complete theory workshops, field work, and lab work that will convey the information required for the NOCTI exam on resource management,
06) GIS SPACE certification – Students will be required to complete theory workshops, field work, and lab work that will convey the information required for the SPACE GIS STEM certification.

4. How are students selected to take the technical assessment? Are all students scheduled to take the technical assessment?

For the moment, all students have been required to take the theoretical NOCTI technical assessment and 100% have passed in two separate years. We will provide a score report during the External Review Visit.

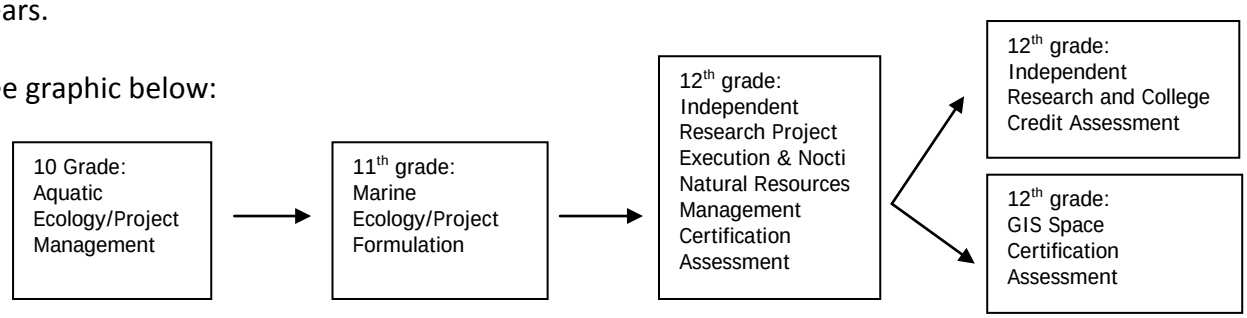
As explained in item 2 above, we haven't provided students with the SPACE GIS practical assessment. We plan on having the capacity to start teaching the full curriculum to seniors by December 2014.

Also, as proposed above in item 2, we would like to add as the Independent Research Component that is college credit bearing as our main practical assessment. In this manner, students who do not qualify for this rigorous challenge can opt for the more teacher led SPACE GIS certification pathway in their senior year.

To be clear, both pathways build upon prior knowledge obtained in the previous two scaffolded

years.

See graphic below:



5. When will students take the assessment?

Students take the theoretical NOCTI Natural Resources Systems and the practical SPACE GIS assessments towards the end of their senior year.

As proposed, students will obtain college credit during their 11th grade summer and school year and 12th grade summer and school year. However, in addition to obtaining college credit, they must compete in 3 regional science fairs and write a professional research paper & poster board in order to qualify for this route of the practical assessment.

6. How many students will take the assessment this year?

All 12th grade students will take NOCTI Natural Resources Systems assessment (*i.e.* 15).
No student will take the SPACE GIS assessment this year.
9 students in the 11th grade are on track to receive college credit this year.

3 students were successful at obtaining 2 college credits each last year.

More students would have qualified for college credit last year but there was a delay in getting the appropriate paper work in to SUNY Albany.

C6 Program Access for All Students

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☐	Students from different social and ethnic backgrounds or with specific needs/disabilities are supported very effectively. The school places a high priority on equality of access to its program and can point to striking examples of vulnerable students being supported well and consequently making good progress.
Meets standard ☒	• Program is designed to guarantee access for students regardless of gender, race, ethnicity, and/or disabilities. • Modifications are made to accommodate students who require alternative learning, testing, equipment, facilities, and other articulated needs.
Under-developed ☐	• Significant groups of students are unable to access the full program because of a lack of programmatic adaptations or resources. • Curriculum materials and testing arrangements are not modified sufficiently to take account of the full range of student knowledge and skills, resulting in a significant gap of under-performing students or students not given the opportunity to participate.

Directions: Please complete table 3 in section D for item 1 and provide a narrative response.

C6 Program Access for All Students
Supporting Document(s) Required: • **Program Enrollment Data (Table3)** in section C of the self-evaluation form.

1. What accommodations are made for students with IEPs?
   (please share any documents, sample lesson plans or share anecdotal information)

Students with IEPs and all other students have the opportunity to advance in this course because achievement is individually tailored. All students are encouraged to meet with the instructor once every two weeks. During these meetings, progress is tracked, tasks are set, advice is given, and questions are answered. The results of these meetings are recorded on a Science Research Project Conference Report (formerly called a GOAL planner) by the student and on a spread sheet by the instructor. The Report is kept in the student's portfolio and all previous reports must be available at all meetings to keep track of the student's progress. An evaluation is also given to the student after every individualized meeting with clear expectations that need to be met.

Alternative formative assessments have been incorporated into the program such as portfolio reviews, research journal reviews, multiple drafts of research papers, multiple drafts of slide show presentations, extended time to submit required research components, one-on-one teacher/student meetings for project advancement, office hours available by appointment, group work, hands-on activities, encouragement to look for advisor and mentors in students' given area of research interest, etc. Content reviews are incorporated into the curriculum via scaffolding to help prepare students for summative assessments.

The only reason why this is not "High Quality" is that the process has to be streamlined and applied more effectively. This will happen with time as the program coordinator spends less time building the program's formal components and more time with the students.

Work-Based Learning

W1 Established Work-Based Learning Sequence

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality *(additional to meeting standard)* ☐	• There is a formal and structured work-based learning scope and sequence that all students from the program follow via a progression of rich and varied practical experiences including career exploratory activities, job readiness training, mentoring and industry-based competitions. Activities expose students to all aspects of an industry and meet the range of students' needs and aspirations. • Activities lead up to internships through well-established partnership with one or more hosts who provide industry-appropriate assignments
Meets standard ☒	• There is a work-based learning scope and sequence that provides grade-appropriate career exploratory and job readiness activities throughout the program sequence. Activities range in skill building and application, from industry site visits and guest lectures, to job-shadowing and career-related competitions, that lead up to internship opportunities. • Internships are done in partnership with a host that places students in a work setting (where appropriate) to gain authentic workplace experiences through an internship.
Under-developed ☐	• Formal work-based learning partnerships are only in development or offer very limited opportunities for students to gain relevant practical experience through internship, exploratory activities or other external workplace experience. • Activities or internship do not necessarily align to the program area of study.

Directions: Please complete table 4 in section D for item 1 and check the WBL programs and/or experiences provided for students in item2.

W1 Established Work-Based Learning Sequence

Supporting Document(s) Required:

- **Work-Based Learning Sequence (Table 4)** in section C of the self-evaluation form.

1. Is there a WBL scope and sequence in place? ☒ Yes ☐ No

2. Which of the following WBL activities are currently in place? Check all that apply.

	New York State Registered Programs		Other Work-based Learning Experiences
	Cooperative CTE Work Experience Program (CO-OP)	X	Worksite tours
	Career Exploration Internship Program (CEIP)	X	Job shadowing
	General Education Work Experience Program (GEWEP)	X	Youth apprenticeships
	Work Experience and Career Exploration Program (WECEP)	X	On-site projects
			Supervised licensed clinical experience (Health Occupations)
		X	Community service/learning
		X	School-year/summer internships
			Other (please explain)

W2 Student Access to WBL

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality *(additional to meeting standard)* ☐	• Student participation in WBL activities is very high. The varied range of opportunities and good information provided to students enables them to be involved in making choices and placements to be tailored to their needs. Consequently, students gain the most from their experiences, regardless of academic ability, race, gender, ethnicity or disability.
Meets standard ☒	• Program ensures that all students in program are aware of and given an opportunity to participate in work-based learning. • Work-based learning program is designed to guarantee access for students regardless of gender, race, ethnicity, and/or disabilities. • Modifications are made to ensure access to work-based learning
Under-developed ☐	• While there are some WBL opportunities, there are too few to meet the needs of all students. Those with specific needs/disabilities have limited access to WBL.

Directions: Please complete table 3 in section D if you have not already included the number of students who are participating in work-based learning for item 1. Provide a narrative response for item 2.

W2 Student Access to WBL

Supporting Document(s) Required:

- **Program Enrollment Data (Table3)** in section C of the self-evaluation form.

1. How are students informed about work- based learning opportunities offered in this program?

The program coordinator offers the WBL opportunities throughout the school year as they are made available. Opportunities will be posted in the Harbor SEALs website on a special WBL page that will be password protected to avoid conflict with non-Harbor school students. Only Harbor school students will be given the password. Opportunities may also be posted in the lab bulletin board.

Proof of internship placements in the form of applications and Work Site Plans are stored in student portfolios and will be made available during the Site Visit.

2. How are work-based learning activities adapted to enable students with disabilities or specific learning needs to participate?

The program has a work based learning scope and sequence that begins with discreet exposure of students to professional settings and experiences such as conferences, expert lectures in post secondary institutions, visits by industry professional lecturers to the school, and the development of program/industry relate technical skills throughout the school year. In the advanced levels of the program, students will be required to submit a professional level research project completed in collaboration with a scientist or expert mentor. Students will then be encouraged to pursue an internship with the mentor or other related program site to gain authentic workplace experience.

W3 Assessing Student Progress in WBL

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality *(additional to meeting standard)* ☐	• Students understand the knowledge and skills they are expected to gain from their WBL experience, including internships, through a detailed training plan and use of the appropriate skills & competency profile which addresses various settings and types of activities. For internships, there is a clear link between the training plan and the students' performance evaluation with the employer. Students are fully engaged participants in systems for evaluating and recording their learning and progress with the school and their employer, where applicable.
Meets standard ☒	• Student learning and progress through work-based learning component are assessed and documented through an agreed-upon system of evaluation process developed by the school. There is a student evaluation process specific to internships developed by the school and the employer. • The student has a training plan and skills & competency profile (e.g., Work Skills Employability Profile document) to follow and monitor over the course of the work-based learning sequence and/or internship.
Under-developed ☐	• Assessment arrangements are informal and few systems are in place to ensure consistency between WBL activities and internship placements. Students have limited guidance specific to the WBL setting and about the knowledge and skills to be developed through WBL.

Directions: Please provide the Evaluation Rubric and Training Plan as indicated in section C list of supporting documents and provide narrative responses to items 1-4.

W3 Assessing Student Progress in WBL
Supporting Document(s) Required: • **Evaluation Rubric** • **Student Training Plan**

1. How is student learning assessed in work-based learning?

For professional visits or industry tours, students are required to fill out an evaluation form outlining what they learned, questions they asked, answers they received to those questions, and a general journal section that is completed in brainstorm fashion.

For WBL internships, students keep a detailed Guide in their portfolios that includes the following sections:

- □ Internship Contract
- □ Internship Standards of Conduct
- □ Internship Site Orientation Checklist
- □ Work Site Learning Plan
- □ Worksite Journals:
- □ Intern Assessment Form
- □ Student Internship Evaluation
- □ Student Self Evaluation

Students and internship sites fill out their respective sections. Students are then expected to prepare a slide show and professional presentation of their experiences to share with the cohort the following school year. The target audience for the presentations are fellow students in September and Professional Advisory Committee members in December.

Specifically, in the section named "Work Site Learning Plan," tasks are defined that are site specific, the skills necessary to perform them are defined, the schedule is defined, processes are defined, safety precautions are defined, etc. Also, the "Worksite Log" section provides the student with a series of guiding questions that they can use to answer what they learned and other comments.

2. How is the student training plan used to assess student progress?

There are 2 "Intern Assessment Forms that are filled out in the middle of the experience and then a follow up towards the end. This form is filled out by the site supervisor. Based on the information obtained students the work will be modified as needed.

3. How is the Work Skills Employability Profile used to monitor student progress over the course of the work-based learning sequence and/or internship, and program course sequence?

Each student has a "Work Skills Employability Competencies List" that they get signed as they complete industry skills throughout the program sequence. Students are required to meet one-on-one with the program coordinator at least once a month to update the Profile. At this point, progress is assessed and goals with time requirements are defined. This is kept in a special form that students maintain in their portfolios that they must bring with them to the meeting. Old goals are assessed and new ones defined. A grade is given for this "Student/Advisor" meeting. If the skill can be assessed during the meeting then it is performed. If not, then the student sets up a time when that skill can be assessed during a field experience.

4. How is it maintained throughout the years at the school? Where and by whom?

The "Work Skills Employability Profile" is kept by the student in their portfolio. The portfolios are kept in the class room in a specially designated shelf.

W4 Connection Between WBL and Class Instruction

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☐	• WBL scope and sequence is well established, of high quality and builds systematically on the school-based curriculum so that both dovetail with academic and industry skill standards. Consequently, students typically make good progress in their overall learning and specific skills acquisition.
Meets standard ☒	• Work-based learning complements school-based learning and the program curriculum. • Skills and job competencies practiced or expected to be acquired through work-based learning are aligned with academic and industry standards.
Under-developed ☐	• There are some work based learning activities in place but the knowledge and skills gained from the program curriculum are not sufficiently integrated with those of WBL to enable one to reinforce the other. • Skills and competencies associated with WBL have not been aligned with academic and industry standards.

Directions: Please provide the work skills employability profile as indicated in section C list of supporting documents and provide a narrative response to item 1.

W4 Connection Between WBL and Class Instruction
Supporting Document(s) Required: • **Work-skills employability profile**
1. How does the work-based learning sequence complement or build on the school-based curriculum to align both academic and industry skills? Principally, WBL will give the student the experience of work in a professional setting that the school-based curriculum cannot deliver. Among the skills obtained is how to gather data alongside an industry specialist. The school-based curriculum teaches students how to gather data in more prearranged formats and the student is guided along each step of the way. In the WBL experience the student is expected to be able to trouble shoot and take ownership of the work. For example, in the class, students learn how to calibrate their instruments. The instructor guides them each step of the way and teaches the theory behind calibration. In the WBL experience, the student is expected to perform these skills without having to be told whenever instrumentation is required and to understand how the data is affected by it.

W5 WBL Internship Orientation for Students & Employers

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality *(additional to meeting standard)* ☐	• Clear and accessible processes (see "Meets standard" items for full scope) for guiding students, parents/guardians, and employers in preparation for WBL. • These processes are have a history of being well-established, comprehensive and understood by both students and employers. Some practices are exemplary and consequently, the school can point to examples of highly successful WBL experiences which may involve students with special needs.
Meets standard ☒	• Process in place to prepare students and employers for WBL experience, including job-readiness training, student organizations, provisions of learning guidelines & procedures for students and employers, as well as process for assessing the work-based learning experience (including individualized Work Skills Employability Profiles, training plans, career plans, etc.).
Under-developed ☐	• Dialogue between the school, students and employers to prepare and guide them for WBL is not structured or systematic enough to ensure that each placement is guided by learning guidelines and procedures for both employers and students. Consequently, students are not prepared enough to gain the most from their experience and cannot be assessed around clearly identified criteria

Directions: Please provide a list of host employers in table 5 in section D and provide narrative responses for items 1 and 2.

W5 WBL Internship Orientation for Students & Employers

Supporting Document(s) Required:

- **List of work-based learning internships and host employers available to students (Table5)** in section D of the self-evaluation form.

1. Describe the process including activities and materials used to prepare students for internship placements.

The school-based curriculum prepares the student for internships by:

- Teaching basic computer skills,
- Data gathering in the lab and field,
- Using professional instrumentation for experiments,
- Teaching the project formulation and management process,
- Drilling students with professional presentation practice,
- Requiring students to read peer reviewed journal articles,
- Requiring students to prepare a literature review and writing a scientific report,
- Giving student the opportunity t develop leadership skills and team building efforts,
- Teaching students to keep detailed logs of work, lists of materials, and protocols,

2. Describe the process for host employers for internship placements.

Host employers have application materials that can include relevant essay writing, teacher recommendations, and formal paper work copies (i.e. Working Papers). They also have an interview process where they evaluate a student's "Work Skills Employability Profile" and portfolio.

W6 WBL Evaluation by School & Industry Partner

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☐	• Processes and procedures for evaluating the quality of the WBL program are systematic, routine to the school, and draw on both employers' and students' views. There is an emerging track record of effective steps taken to improve aspects of provision or adapt to changing industry needs in partnership with employers.
Meets standard ☒	• School and participating employers have processes to evaluate and develop and review the WBL and internship activities each year based on employer and student experiences as well as emerging program and industry needs.
Under-developed ☐	• Arrangements for reviewing and improving the quality of WBL are informal and may not cover all the activities or internship placements. Consequently, there is limited secure and reliable information available to guide improvements to quality or to adapt to changing industry needs.

Directions: Please provide a narrative response for item 1.

W6 WBL Evaluation by School & Industry Partner

1. How are WBL activities and internships evaluated by the following groups:

a) the school

Students are expected to prepare a slide show and professional presentation of their experiences to share with the cohort the following school year. The target audience for the presentations are fellow students & CTE staff in September, and Professional Advisory Committee members in December. Evaluation forms filled out by students will be reviewed during the Self-study meetings, by the individual program coordinators, and during Professional Advisory Committee meetings.

b) students

Students have an evaluation form that they fill out towards the end of the experience.

c) industry partners

Once a year, during our Professional Advisory Committee meetings, our Industry Partners and post-secondary partners will evaluate the internship activities through the student filled evaluation forms and the student presentations performed by seniors.

These evaluation forms are part of the packet the student/industry partners receive.

Assessment and Accountability

A1 Industry-Recognized Technical Assessment

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☒	• Technical assessments and end of sequence examinations are comprehensive and of high quality. Students understand the assessment criteria and marks awarded to enable them to better respond with what is required. A variety of assessments are used that fit the purpose of assessing the full range of knowledge and competencies for the industry, including knowledge-based and performance-based.
Meets standard ☐	• The technical assessment is comprised of written examination(s), student project(s) and student demonstration/performance(s), all of which have clear criteria and scoring rubrics. • Program's end-of-sequence exam is sanctioned by industry partners and aligned with industry-defined skills/competency standards. • Where applicable, upon successful completion of industry-approved technical assessment, students will acquire portable licensing, certification, or credentials supported by state/national associations and/or by business/industry.
Under-developed ☐	• Technical assessments seem too broad in range and type and lack criteria that collectively cover the range of knowledge and skills or scoring rubrics to ensure consistency. • Assessments may not align, or only partly align, with industry standards and are not sanctioned by industry partners. • Students do not gain portable licensing, or industry-recognized certification or credentials.

Directions: Please provide the Letter of support as indicated in section C list of supporting documents and provide narrative responses to items 1-4.

A1 Industry-Recognized Technical Assessment
Supporting Document(s) Required: • **Letter of support from business/industry partner**
1. Which industry-approved technical assessment is used to evaluate student learning and skills at the completion of the program sequence? Please provide the name and numerical code if applicable. Technical assessments and end of sequence examinations are comprehensive and of high quality. They've been produced by nationally and industry accredited organizations. Students have access to study guides to help them respond with what is required. Evidence: Theoretical Assessment - NOCTI Natural Resources Systems - http://www.nocti.org/PDFs/JobReady/1228_Natural_Resource_Systems.pdf Practical Assessment 01 – Digital Quest's SPACE GIS - http://www.digitalquest.com/certification.html?panel=1 Practical Assessment 02 – SUNY Albany College Credit (Independent research project approved by a scientist mentor and Scientific Review Committee, college level research paper written, and compete in 3 regional science fairs. http://www.albany.edu/uhs/

2. Does the technical assessment include written, demonstration and project components? Provide samples.

Theoretical Culminating Assessment - NOCTI Natural Resources Systems -
http://www.nocti.org/PDFs/JobReady/1228_Natural_Resource_Systems.pdf
This assessment includes only written multiple choice components.

Practical Culminating Assessment 01 – Digital Quest's SPACE GIS -
http://www.digitalquest.com/certification.html?panel=1
This assessment includes written and final project components. Digital Quest does not allow for a sample of its assessment to be posted. Please contact them directly for a sample.

Practical Culminating Assessment 02 – SUNY Albany College Credit (Independent research project approved by a scientist mentor and Scientific Review Committee, college level research paper written, and compete in 3 regional science fairs.
http://www.albany.edu/uhs/
Course Syllabus
http://collegenow.cuny.edu/sciencefair/rules-and-guidelines/
This assessment includes demonstration, written, and project component. The demonstration component is evaluated by the scientist mentor or program instructor during field or lab data acquisition. The written and project component in the form of a research portfolio, research journal, research plan, research paper, and poster board are evaluated by the course instructor, a scientific review committee during the Professional Advisory Committee meeting, and when competing in the New York City Science and Engineering Fair.

3. Which form of assessment is used as the final or culminating project? (portfolio, project, etc.)

The technical assessment, SPACE assessment project, and final research paper/portfolio/or lab notebook are used as the culminating assessments. See above point for more detail.

4. Do students earn an industry license or certification or eligibility for advanced training or apprenticeship in the field upon successful completion of the technical assessment(s)? If so, please list certification title(s) below.

A) SPACE Certification by Enterprise for Innovative Geospatial Solutions (EIGS)
B) NOCTI Certification for Natural Resources Systems
C) 12 College Credits through SUNY Albany
D) Certification for competing in a Science Research Fair.

A2 Mechanisms to Monitor Student Achievement

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☐	• There are highly effective procedures for assessing students' performance toward program objectives and technical standards that are monitored by program leaders for their consistency. A range of assessment methods are used, each guided by clear criteria and scoring rubrics that students are clearly made aware of.
Meets standard ☒	• There are established assessment procedures (formal testing, portfolio, Work Skills Employability Profile etc.) to monitor and evaluate students' attainment of program objectives, academic and technical standards. • There are clear criteria and scoring rubrics used to assess student learning.
Under-developed ☐	• Assessment is not guided by clear procedures or monitored for quality. Students are assessed using informal methods that may not be clearly linked to course objectives, assessment criteria, or technical standards. Scoring methods for assessing student learning do not routinely use clear scoring schemes linked to criteria.

Directions: Please provide a narrative response for item 1.

A2 Mechanisms to Monitor Student Achievement

1. Which assessment procedures are in place (formal testing, portfolio, work skills employability profile, etc.) to monitor and evaluate the students' attainment of program objectives, academic and technical standards?

The following formative assessments exist to determine student progress during development. Click on each hyperlink for more information:

A) Research Journal
B) Work Skills Employability Profile
C) Portfolio
D) Biweekly Science Research Project Conference Report
E) Biweekly assessment of student performance
F) Project management step inventory
G) Project management chronograms

A3 Mechanisms to Gather and Use CTE Program Data

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☐	• A comprehensive database of student assessments enables course leaders to monitor student performance over time, make timely interventions and provide additional support where necessary. Teachers have good access to such data, use it effectively to guide instruction, and review the effectiveness of course components. Consequently, student achievement is reasonably consistent across different groups and abilities.
Meets standard ☐	• There is an established process for the school to gather and maintain data on CTE student performances and cohort achievements. • Such data is analyzed and used to drive instruction, evaluate student needs, and design support to meet such needs.
Under-developed ☐	• While records of student assessments are retained, these may not be reviewed and coordinated regularly in a systematic process to sufficiently give a full picture of student performance or to analyze where strengths and weaknesses lie to guide instruction, identify student needs, or review its impact of the program objectives.

Directions: Please provide narrative responses for items 1 and 2.

A3 Mechanisms to Gather and Use CTE Program Data
1. How does the school gather and maintain data on CTE student performance and cohort achievements? **2.** How is data analyzed and used to drive instruction, evaluate student needs, and design support to meet the needs of students?

A4 Mechanisms to Gather School-wide Data

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☐	• The school keeps comprehensive yearly data on each student that meets the standard required. In addition, the school seeks other relevant information such as postsecondary plans and attendance rates to help guide its developmental work. Systems enable such data to be analyzed for patterns and trends, including ethnicity, gender and special education needs.
Meets standard ☐	• School collects and maintains yearly data on student enrolment, program completers, high school diploma recipients, students receiving special education services, work-based learning participants, students that pass all three components of technical assessment, and postsecondary placements. • All CTE courses are coded appropriately in STARS (formerly HSST).
Under-developed ☐	• Some yearly data is kept on aspects of the CTE program but there are gaps in important areas. The system may not be structured sufficiently well to enable program leaders to make regular analyzes that can inform decisions about quality and effectiveness of the program.

Directions: Please provide narrative responses for items 1 and 2.

A4 Mechanisms to Gather School-wide Data
1. How does the school collect and maintain annual data on student enrollment, attendance, program completers, diploma recipients, students receiving special education services, work-based learning participants, students that pass the technical assessment? **2.** Which systems are in place to analyze data annually?

A5 Process for Annual Evaluation of CTE Program

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☐	• Annual evaluation is systematic and central to the school's ethos of continuous improvement. Information is sought from all stake holders and the school to rigorously evaluate the impact of components of the program on outcomes for groups of students, including ethnicity, gender and special educational need. Consequently, school has demonstrated striking examples of programmatic changes made that have raised the quality of provision.
Meets standard ☐	• School has formal process to annually evaluate program outcomes and effectiveness based on various data points (student performance, teacher feedback, advisory council feedback, etc.).
Under-developed ☐	• Processes for evaluating the program are limited and may not be structured sufficiently to cover all elements. Reviews do not seem to fully integrate an account of outcomes, such as student achievement in program components, student attendance, completion rates and advisory council feedback, to be rigorous and objective.

Directions: Please provide narrative responses for items 1 and 2.

A5 Process for Annual Evaluation of CTE Program
1. How does the school annually evaluate the program outcomes to promote improvement? **2.** How are stakeholders are involved in this process?

Partnerships

P1 Involvement of External Partners

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality *(additional to meeting standard)* ☒	• The range of business/industry/labor and postsecondary partners involved in the advisory group reflects the extensive and influential roles that external partners play in the implementation of the program. The advisory group's role is well-defined and integral to the review, strategy, and improvement of the program with the school so that content and design quality is subject to regular review and improvement. The school has a well-established system to seek input from external partners and there is a clear demonstration that the partnership challenges what the school does and provides a secure endorsement of the quality of provision in preparing students for entry to industry and postsecondary education.
Meets standard ☐	• Program has a business/industry/labor and postsecondary advisory group that participates in the review and maintenance of the program, including content, course sequence, instructional setting, work-based learning scope and sequence, technical assessment, postsecondary planning, and equipment to ensure that there is alignment with industry standards, expectations, and trends. Such industry-based partners validate the curriculum to be appropriate for preparing students with skills and knowledge required for entry into industry and/or postsecondary education
Under-developed ☐	• There are a few business/industry/labor partners involved in the review and maintenance of the program but they are not organized into an advisory group, their involvement is limited or may not cover key aspects of the program content, sequence, instructional setting and resources. Consequently, they cannot provide a secure validation of the quality of provision in preparing students for entry into industry and/or postsecondary education.

Directions: Please complete table 6 in section D, provide the articulation agreement as indicated in section C list of supporting documents and provide narrative responses for items 1- 3.

P1 Involvement of External Partners
Supporting Document(s) Required: • **Composition of Self-study team (Table 6)** • **Postsecondary articulation agreement(s)**
1. Identify partners that have reviewed your CTE program. Columbia University – Lamont Doherty Earth Observatory* Yellow Springs Instruments Inc.* Roger Williams University* Hudson River Foundation* Manhattan College* Sea Savers Inc.* Stevens Institute of Technology ESRI Inc Digital Quest Inc

2. How do your partners provide support in the review and maintenance of your CTE program?

Partners are considered Professional Advisory Committee members and meet as a group once a year to evaluate the various components of the program. In addition, these same members will meet with the program director independently throughout the year or communicate via e-mail to develop specialized portions of the program. This is an ongoing process. Generally, the curriculum outline and other written materials are printed before a meeting and are sent for their review. Partners then annotate the written materials and return it to the director. Examples of these materials are available upon request.

3. Has this curriculum been reviewed and approved by postsecondary/industry partners and determined to be appropriate for the industry/career area?

Yes. See list above with asterisk (*).

Articulation agreements will be shared during a career and college readiness lesson during the junior semester course Intermediate Marine Research II, will be permanently posted on a lab bulletin board, and shared in the Harbor SEALs web page. These agreements will also be distributed and shared during PTA meetings.

P2 Industry Review of Program's Technical Assessment

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality *(additional to meeting standard)* ☒	• There is a demonstrated strong collaboration and well-developed yearly processes with business/industry and post secondary partners in the process of evaluating the quality and rigor of the program's industry technical assessment. Feedback is comprehensive, reliable and leads to improvements where appropriate. School follows up on verification of the rigor and relevance of its assessment to industry skill standards by encouraging/helping students to obtain appropriate industry work credential/license or advance to postsecondary education/training.
Meets standard ☐	• Business/industry and postsecondary partners participate in the review of the program's technical assessment on an annual basis and validate it as appropriate instrument to evaluate student's skills and knowledge: o based on industry standards and needs, and/or o to obtain credentials/license to pursue career in given industry, and/or o to advance into postsecondary education, training, etc.
Under-developed ☐	• There is some involvement by business/industry and postsecondary partners in the review of the program's technical assessment but it is limited in scope and may not be regular (not even annual). The review may not be sufficiently structured or related to industry standards, postsecondary education, or requirements to obtain credentials/license to work in the given industry to provide a secure validation of its quality.

Directions: Please provide a narrative response for item 1.

P2 Industry Review of Program's Technical Assessment
Supporting Document(s) Required: • **Current business/industry-partner articulation agreement**
1. To what extent do business/industry and postsecondary partners participate in the review of the programs' technical assessment? Professional Advisory Committee members review the assessments on a yearly basis and determine its relevance to industry and postsecondary education. Examples of the assessments are given to the PAC members to review and endorse. To date 6 members have written a letter of endorsement for the assessments.

Program and School Capacity

PSC1 Systematic Process for Program Evaluation & Improvement

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☒	• An advisory committee has demonstrated a history of being well-established and influential in shaping the development of the program. • The committee can draw on a wealth of relevant expertise to advise on current needs and trends and collaborate in the program. • It is well organized, vigorous, and has the capacity to meet the school's needs in updating the curriculum and technical assessment, providing technical assistance and extending partnerships.
Meets standard ☐	• Program-specific advisory committee is engaged in ongoing improvement of the program through: o review and updating of curriculum and technical assessment, o keeping the school apprised of current trends and needs in the given career/technical industry area, o identifying key partners for program, o providing technical assistance, o aligning resources for school use, and engaging in other collaborative efforts.
Under-developed ☐	• A program specific advisory committee is being established but may not have the breadth of expertise that reflects the industry/career area. It is beginning to work with the school to review its program, advise on curriculum components and their technical assessment and to provide technical assistance, but its influence is not yet central to the school's monitoring and review.

Directions: Please provide evidence of the work of the self-study group as indicated in section C and provide a narrative response for item 1.

PSC1 Systematic Process for Program Evaluation & Improvement
Supporting Document(s) Required: • **Evidence of the work of the self-study group**
1. To what extent does the advisory committee influence the evaluation of the program to promote improvement? The Professional Advisory Committee (PAC) is made up of numerous representatives of industry and post-secondary organizations. They have reviewed and updated the curriculum and given advice on how to improve it on a yearly basis. Their input has been instrumental and all encompassing when it comes to developing the program. They have provided technical assistance and aligned significant resources for the program.

PSC2 Postsecondary Guidance and Counseling

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☒	• The school has demonstrated a high reputation among program students for the quality and range of guidance counseling to support them. Students feel very well informed of the range of options available and have clear postsecondary plans that they readily seek advice and plan pathways for their futures.
Meets standard ☐	• School provides guidance counseling support for program students. • Guidance staff and teachers make effort to provide students and families with information and choices for career and higher education awareness, exploration, and planning as viable postsecondary pathways.
Under-developed ☐	• Guidance counseling support for program students and their families is quite limited and may not be sufficient to meet the full range of students' needs and aspirations. There is no clear system in place. • Some students may not have immediate access to guidance when making key choices about options for career and higher education.

Directions: Please provide a narrative response for item 1.

PSC2 Postsecondary Guidance and Counseling

1. How do guidance staff and teachers provide students and families with information and choices for postsecondary pathways?

Guidance: The "college office" has great staff members that have generated lists of colleges that align with the program. They have also reached out to various industry partners to promote work-based learning opportunities. Guidance begins by meeting with HS juniors to get them to begin the college exploration process. They are encouraged to write personal statements and resumes and are taken on college trips. HS seniors are walked through the college application process and are provided with financial aid and scholarship information.

Teachers: The teacher works hand in hand with the college office to ensure that all students in the program are given the correct guidance and sufficient time to become educated of the college application process. The teacher assigns specific class time so that the "college office" can make presentations, invite alumni to speak, and invite college reps to speak to students. Various articles on today's college experience are given to read to the students and then discussed in class.

The postsecondary guidance process is one of the best running components of the program.

2. How many staff members work in the college office? –

The College Office is funded for 3 staff members - the Director, College Advisor, and the Student Opportunities Coordinator. We currently have 2 staff members (Joe & I) and are in the process of hiring a third staff member.

3. Please describe the college application and financial aid "walk through" process and provide guidance materials shared with students and families.

Beginning in junior year, students receive one-on-one counseling with a college advisor. During these sessions, students discuss career options and potential majors, develop lists of colleges to investigate/visit, and discover potential scholarships for which they may qualify. Students also register for and take the SAT or ACT in April, May, or June. Over the summer between junior and senior year, students continue to

investigate colleges on their list and draft their college essays. In senior year, students again register for and take the SAT or ACT in October or November. College advisors work with students to complete applications to CUNY, SUNY, and private schools through the Common Application. Students continue to research and apply for scholarships; they also request letters of recommendation from teachers. In November, students and staff participate in Harbor Up All Night, an overnight program in which students and staff edit and revise college essays and complete applications. By December of senior year, students have completed their college applications and essays, and all application materials are submitted to colleges. Advisors collect financial information from parents throughout the fall semester in order to assist students and parents with the financial aid process. With assistance from college advisors, students request a FAFSA PIN and complete the FAFSA online in January (and update it as needed). College advisors, in conjunction with the PTA, sponsor financial aid workshops for parents and students in January.

4. What postsecondary guidance is provided to students who choose a career pathway other than marine biology?

All students are provided with college and career guidance in the same way from our office. If students wish to pursue post-secondary education or career opportunities outside of their CTE program, college advisors work with the students to choose college majors related to their desired career and assist in finding appropriate colleges for these students.

5. How are parents informed and involved in the postsecondary counseling provided to students?

Parents receive information in various ways from the College Office, including via email, mailed letters, and personal phone calls. A letter introducing the office staff and the services offered by the staff is sent to the parents and guardians of seniors in early September. Additional letters and emails are sent throughout the school year informing parents and guardians about various deadlines, events, and programs. Advisors contact parents by phone as needed.

PSC3 Professional Development for Faculty

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☐	• Continuous professional development of staff is central to the school's ambitions for promoting high quality in the program. • Through systematic appraisal of teachers' skills and expertise in relation to program needs, the school invests in a coordinated effort to ensure that teachers are up-to-date and highly skilled. • Plans for the program's improvement routinely identify and adopt professional development needs to ensure their success.
Meets standard ☒	• Professional development is provided for teachers to stay current with changes and emerging trends in the industry and instructional practices through externships, industry specific workshops, conference, performance evaluations, further schooling, and other professional development opportunities.
Under-developed ☐	• Professional development of teachers involved in the program is provided but it is not linked closely to program needs and tends to be provided on an ad-hoc basis. • Access to professional development may not be consistent across all teachers.

Directions: Please provide a narrative response for item 1.

PSC3 Professional Development for Faculty

1. Describe the types of professional development provided for teachers to stay current with changes and emerging trends in the industry? *(externships, industry specific workshops, conference, performance evaluations, further schooling, other)*

Teachers are allowed to participate in industry conferences and professional development. Teachers actively seek new externships opportunities to stay up-to-date in their skills and are encouraged to take industry specific college courses formally or informally through free online programs such as EdX (https://www.edx.org/). Industry partners such as NOAA, SEArc, Columbia University, Manhattan College, ESRI, etc. have provided specific workshops to train the instructors in specific to general content.

We have provided a list of PD that we've been a part of in the MBRP. There are flyers, booklets, and notes taken during these events to act as evidence.

PSC4 Program Information

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☒	• Channels of communication are varied, proactive, and effective in reaching all students and their families, regardless of background, home language or ethnicity. Information on CTE program and services is of high quality and there is a good access to additional information.
Meets standard ☐	• School provides information on CTE program and services to all students and families, including special populations. • Information is available in variety of languages and school use different channels of communications to promote the program.
Under-developed ☐	• Information on CTE program and services is provided to students and families but harder to reach families may not have access to it because of language difficulties or limited communication channels.

Directions: Please provide a narrative response for item 1.

PSC4 Program Information

1. How does the school provide information on the CTE program and services to all students and families, including special populations and regardless of background or home language? Which arrangements have been made to distribute this information?

   Provide examples from any of the following sources: promotional materials for students and parent, including the relevant pages from the NYCDOE High School Directory, school report cards, brochures specific to the program, newsletters, press releases, and website materials.

Web based program information –
A web page has been developed to provide information for students and parents. See
http://harborseals.org/sample-page/curriculum/
Other sources:
http://newyorkharborschool.org/our-curriculum/career-tech-education/
More general info:
http://www.newyorkharborschool.org/documents/harbor-current-application.pdf and
http://nyharborschool.tumblr.com/

The school newspapers highlight CTE programs and are available upon request.

Other more specific brochures are given out to prospective students and guardians.

Classroom time is given to instructors to visit all new potential 9th grade candidates and present the program.

PSC5 Adequate Program Equipment and Facilities

Judgments: Make your judgments about this component and enter **X** in the appropriate box that best fits this aspect of your program	
High Quality ***(additional to meeting standard)*** ☐	• Accommodation and facilities are comprehensive, of high quality and well maintained. Specialist equipment is provided in all key areas of the program to enable all students to develop and master the full range skills and competencies required.
Meets standard ☒	• Safe and appropriate facilities and equipment are available to accommodate the teaching and learning demands of program.
Under-developed ☐	• While there is adequate accommodation for the program, there may be a lack of specialist facilities and equipment in key components of the program to adequately enable students to develop their skills and competencies in significant areas.

Directions: Please provide a narrative response for item 1.

PSC5 Adequate Program Equipment and Facilities

1. Explain how you determine that the equipment available is safe and appropriate to accommodate the teaching and learning demands of the program?

The program follows OSHA regulations for its facilities and equipment. Extensive field and lab safety training is mandatory for all students. First Aid and safety equipment is provided and clearly placed and labelled. Emergency action plans are elaborated by students as part of their training on a yearly basis.

However, because the program is in its development stages, there is still a lack of comprehensive and high quality equipment in all key areas of the program. They are being obtained and developed as the program evolves. A lot of the equipment is expensive and requires multiple years of budget investment to complete.

The curriculum guide and assessment needs determine what equipment and safety procedures require to be met.

During our PAC meetings, industry and post-secondary partners will be asked to fill out a questionnaire to determine the adequacy of the lab.

Currently, there is a plan to invest about USD 100,000.00 dollars to make improvements to the lab. The plans will be evaluated by the PAC as well before they are implemented.

Equipment Evaluation:

Equipment is evaluated as per our Quality Assurance Project Plan. Evaluating equipment is part of the instruction given to students in the MBRP. Many of the lessons are specifically designed to teach students to calibrate and maintain instruments. These skills are outlined in our Skills Employability Competencies Skills list.

Equipment needed:

GIS equipment (Plotter for GIS map printing, Server for GIS digital library)

Laptops for each student

Digital microscopes and stereoscopes

Genetics equipment (PCR machine, water baths, electrophoresis chambers, centrifuges, micropipettes, ice machine, autoclave, etc.)

Oven

Incubator

YSI physical-chemical parameter handhelds

Fire proof fridge

Water filtration system

Vanveen grabs

Seine Nets

Neuston Net with Manta

Tricycles with storage capacity

Gasoline for boats

Life vests

Waders

Wet suits

Lab coats

Blue tooth and radio antennas and receivers

Long range walkie talkies

Software for each laptop (Primer/Permanova, ArcGIS, Microsoft Office, Matlab, SPSS, digital microscope software)

Subscription to Journals and JSTOR

Website maintenance

Equipment maintenance

Equipment Insurance

You have completed Section B of the self-evaluation form. Please continue on to Section C the list of supporting documents below and review the data tables and the program development plan in section D to ensure it is complete. Sections A and B, C, and D should be emailed to cteprogramapproval@gmail.com

Section C: List of Supporting Documents

Your completed submission must include both the documents noted in this section and the information requested in the data tables provided in **Section D** of this form.

Please note:

- If you have already submitted some of these documents for your program, you must submit the rest in order for your submission to be considered complete. Please indicate where you have already submitted any of the documents/tables listed below by checking the boxes next to each item.
- Please provide documents or complete tables that capture any recent changes or updates that have been implemented to your program since last school year.
- For any documents that are missing or not currently in place please identify these items in the development plan and provide an explanation of how you plan to meet these requirements in the coming school year.
- Where appropriate, please rename files to make documents easily identifiable (*example: abbreviatedschoolname_programname_postsecondaryarticulation.doc*)
- Acceptable document formats are Microsoft Excel/Word documents or PDFs

***Please e-mail all starred items as attachments or as an electronic zipped folder to** cteprogramapproval@gmail.com **.**

1 ☒ ***Course Documentation**
For example: Program objectives and expectations, course descriptions, course syllabi

2 ☒ **Program Course Sequence (Table 1)**
See Section D: Data Tables and Program Development Plans
*Please provide a copy of STARS report 6.52 or a custom report to show the full program sequence

3 ☒ ***Curriculum-Standard Crosswalks**
Crosswalks demonstrating alignment to CDOS and Common core learning standards for all courses in the program sequence

4 ☒ **List of CTE certified program teachers (Table 2)**
See Section D: Data Tables and Program Development Plans
AND
***Copies of state certifications**
for all CTE teachers and the work-based learning coordinator
this includes the work-based learning coordinator's extension certificate

5 ☐ **Work-Based Learning Coordinator (Table 2)**

See Section D: Data Tables and Program Development Plans

6 ☒ **Program Enrollment Data (Table 3)**
See Section D: Data Tables and Program Development Plans
This item serves two purposes, one to capture enrollment data and two, to identify the number of students receiving special education services and the number of students participating in work-based learning activities.

7 ☒ **Work-Based Learning Sequence (Table 4)**
See Section D: Data Tables and Program Development Plans

Technical Assessment (s) and Industry Certification(s)

8 ☒ ***Evaluation Rubric**
This document is used to assess student progress in work-based learning supply a copy of the evaluation rubric or a completed evaluation form for assessing work-based learning

9 ☒ ***Training Plan**
The student training plan is a document used by the school and host employer to set expectations for the internship and track student progress during the WBL opportunities.

Please provide a copy of a completed Training Plan with student ID removed.

10 ☒ ***Completed work-skills employability profile**

Please provide a copy of a completed work-skills employability profile with student ID removed.

11 ☒ **List of work-based learning internships and host employer available to students (Table 5)**
See Section D: Data Tables and Program Development Plans

12 ☒ ***Letter/s of support from industry partner(s)**
Please supply a copy of a supporting letter from industry partner(s) confirming that they have reviewed the technical assessment used for the CTE program of study and recognize it as a valid instrument in evaluating students' technical knowledge and skills in the industry.

13 ☒ **Composition of Self-Study Team (Table 6)**
See Section D: Data Tables and Program Development Plans

14 ☒ ***Postsecondary articulation agreement(s)**
Valid for length of approval period

15 ☒ ***Current business/industry-partner articulation agreement**

An articulation agreement with a business/industry partner that provides postsecondary training, apprenticeship, and/or employment opportunities for students who successfully complete the program.

16 ☐ ***Evidence of the work of the self-study group**
This might include examples of agendas, minutes, sign-in sheets.

PLEASE CONTINUE TO COMPLETE ANY REMAINING PARTS OF SECTION D of the Self-Evaluation Form (separate document)

A confirmation of receipt will be sent once your submission is received.
All submissions should be sent to cteprogramapproval@gmail.com.

Contact Chrisann Lucchetto, Director of Program Approval at 212-356-3733 or Clucche3@schools.nyc.gov OR
Jennifer Velez, Associate Director of Program Approval at JVelez9@schools.nyc.gov if you have questions or concerns regarding your submission.

CTE Self-Evaluation Form

SECTION D: DATA TABLES AND PROGRAM DEVELOPMENT PLANS

CTE School and Program Information (For schools with multiple programs please use one form per program.)	
Name of School:	Urban Assembly New York Harbor School
DBN:	02M551
Principal Name:	Edward Biedermann
CTE Program Name:	Marine Biology Research Program
Program CIP code:	030205
Proposed program start date:	2013
CTE Contact Name:	Edward Biedermann
CTE Contact Number:	917.409.5000
CTE Contact e-mail address:	ebiedermann@nyharborschool.org

DIRECTIONS: Please fill out the tables in this document and e-mail the complete document to cteprogramapproval@gmail.com. This document may be submitted in a zipped folder along with the attachments listed in Section C.

Table of Contents:

Department of Education

TABLE 1: PROGRAM COURSE SEQUENCE

SCHOOL: _____PROGRAM NAME:_____ CIP#_____

Grade Level	Course Code in STARS	Course name	Instructor(s) Name(s)	Term taught by semester	Unit of Credit	If course is integrated or specialized
10	RQS61TQR-01	Introductory Marine Research I	Mauricio Gonzalez	Semester	1	
10	RQS62TQR-01	Introductory Marine Research II	Mauricio Gonzalez	Semester	1	
11	RQS63TQR-01	Intermediate Marine Research I	Mauricio Gonzalez	Semester	1	
11	RQS64TQR-01	Intermediate Marine Research II	Mauricio Gonzalez	Semester	1	Integrated
12	RQS65TQR-01	Advanced Marine Research I	Mauricio Gonzalez	Semester	2	Integrated
12	RQS66TQR-01	Advanced Marine Research II	Mauricio Gonzalez	Semester	2	

For Career and Financial Management: Indicate below the CFM course that students from the program complete (indicate if it is a stand-alone or independent course, or if it is integrated into any of the courses listed above). If CFM is embedded inside the above courses please list CFM in the column labeled as integrated or specialized.

Career and Financial Management ☐ Stand- alone course ☒ Integrated

TOTALS: _____ NYSED UNITS or ___8__ NYC CREDITS

Two NYC Credits equal one NYSED unit.

Department of Education

TABLE 2: QUALIFIED FACULTY

SCHOOL: __**Urban Assembly New York Harbor School**_ PROGRAM NAME: _**Marine Biology Research Program**_ CIP#__**030205**__

Teacher's Name	**Course Taught from CTE Program**	**New York State CTE Certification(s)** **Subject Area** **Type of certificate (Initial/Professional/other)/Year**	**NYSED Certificate temporary or permanent** **(T or P)**	**Industry Certification(s)**
Mauricio Gonzalez	Introductory Marine Research I & II Intermediate Marine Research I & II Advanced Marine Research I & II	Natural Resources and Ecology 7-12 Initial Certificate 2012 - 2017	T (Initial)	Marine Biology Degree; Advanced Scuba Diver; Rescue Diver; ESRI ArcGIS - Geographic Information System Desk Top II ; OSHA Certified

*If your program does not currently have a work –based learning coordinator please provide a description of the structure(s) in place for work-based learning for your program in the development plan table below.

DUPLICATE PAGES AS NEEDED

Department of Education

TABLE 3: PROGRAM ENROLLMENT DATA

OVERALL TOTALS	Male Total	Female Total	Total
Number of students enrolled in the CTE Program	30	26	56
Number of enrolled students receiving special education services.	4	4	8
Number of students participating in work based learning (WBL) activities	30	26	56
Of the WBL students, the number who are participating in WBL Internships.	7	10	17

Category	Grade 9 Male	Grade 9 Female	Grade 9 Total	Grade 10 Male	Grade 10 Female	Grade 10 Total
Number of students enrolled in this CTE program.				13	6	19
Number of enrolled students receiving special education services.				2	2	4
Number of students participating in work based learning (WBL) activities				13	6	19
Of the WBL students, the number who are participating in WBL Internships.				0	0	0

Category	Grade 11 Male	Grade 11 Female	Grade 11 Total	Grade 12 Male	Grade 12 Female	Grade 12 Total
Number of students enrolled in this CTE program.	11	9	20	6	11	17
Number of enrolled students receiving special education services.	1	1	2	1	1	2
Number of students participating in work based learning (WBL) activities	11	9	20	6	11	17
Of the WBL students, the number who are participating in WBL Internships.	4	6	10	3	4	7

TABLE 4: SEQUENCE OF WORK BASED LEARNING

GRADE	INDICATE WHICH WBL EXPERIENCES ARE MADE AVAILABLE TO STUDENTS IN EACH GRADE. YOUR PROGRAM SHOULD OFFER A CONTINUUM OF EXPERIENCE LEADING TO AN INTERNSHIP OR PART TIME EMPLOYMENT.
9	
10	Guest Speakers, Class Trips
11	Interviews, Guest Speakers, Industry Competitions, Unpaid & Paid Internships
12	Career Search, Interviews, Guest Speakers, Industry Competitions, Job Shadowing, Unpaid & Paid Internships

WBL experiences might include: Career Research, Career Interviews, Class trips, Guest Speakers, Industry Competitions, Job Shadowing, Mock Interviews, Paid or Unpaid Internships

Name of Technical Assessment(s):
01. Vendor name: NOCTI Numerical code (where applicable): 02. Vendor name: Digital Quest 03. Vendor name: SUNY Albany 04. Vendor name: New York City Science and Engineering Fair
Industry Certifications offered:
01. NOCTI Natural Resources Systems 02. Geographic Information System: SPACE Certification 03. College Credit: 12 Research Credits from State University at Albany 04. Regional Science Fair Certification

Department of Education

TABLE 5: LIST OF WORK-BASED LEARNING INTERNSHIPS AND HOST EMPLOYER AVAILABLE TO STUDENTS

Host Employer:	Columbia University
Internship Description:	Research Assistant
Typical Assignments:	Project management and execution
Indicate skills, concepts, and work competencies gained and how the information is integrated into instruction:	Skills & Competencies: Project formulation, data collection, data entry, Salt marsh habitat restoration Integration: The projects that students work on in their internships serve to boost year long projects that the students are required to complete for the school year. Students sometimes use the projects directly or apply the skills they learn to new or similar projects. For example, data entry is one of the key skills gained in this internship. Students can use these new skills to improve their data management.

DUPLICATE AS NEEDED OR PROVIDE A SEPARATE DOCUMENT AS EVIDENCE OF YOUR INTERNSHIP PLACEMENTS

Host Employer:	Rutgers University
Internship Description:	Research Assistant
Typical Assignments:	Project management and execution

Indicate skills, concepts, and work competencies gained and how the information is integrated into instruction:	Skills & Concepts: Project formulation, data collection, policy, technical reading Integration: The projects that students work on in their internships serve to boost year long projects that the students are required to complete for the school year. Students sometimes use the projects directly or apply the skills they learn to new or similar projects. For example, technical reading is one of the key skills gained in this internship. Students can use their improved technical reading skills to read through new peer reviewed journal articles in order to build their literature review.

Host Employer:	Manhattan College
Internship Description:	Lab assistant/Research Assistant
Typical Assignments:	Project management and execution
Indicate skills, concepts, and work competencies gained and how the information is integrated into instruction:	Skills & Concepts: Project formulation, data collection, marine resource habitat restoration Integration: The projects that students work on in their internships serve to boost year long projects that the students are required to complete for the school year. Students sometimes use the projects directly or apply the skills they learn to new or similar projects. For example, data collection and field work are two key skills gained in this internship. Students can use these new skills to improve their data gathering and management skills as well as how to prepare for field trips and manage a field day.

Host Employer:	The Nature Conservancy
Internship Description:	Habitat Restoration Technician
Typical Assignments:	Habitat Restoration and Resource Management
Indicate skills, concepts, and work competencies gained and how the information is integrated into instruction:	Skills & Concepts: Biological Corridors, trail restoration, financial management skills, data collection, water quality monitoring Integration: The projects that students work on in their internships serve to boost year long projects that the students are required to complete for the school year. Students sometimes use the projects directly or apply the skills they learn to new or similar projects. For example, one key skill in this internship is habitat restoration. Many biological resources have been impacted by society and have been left in suboptimal conditions. These resources provide services to people and other resources (e.g. forests processing CO2 into O2, avoiding excessive river and lake evaporation, etc). Restoring forests helps to, therefore, improve water resources which are key for human subsistence. Students now get to put theory into practice.

Host Employer:	Wildlife Conservation Society
Internship Description:	Natural Resources Management
Typical Assignments:	Maintaining and studying zoological and aquarium specimens and enclosures

Indicate skills, concepts, and work competencies gained and how the information is integrated into instruction:	Skills & Concepts: Resource management, data collection, environmental monitoring Integration: The projects that students work on in their internships serve to boost year long projects that the students are required to complete for the school year. Students sometimes use the projects directly or apply the skills they learn to new or similar projects. For example, one key skill in this internship is habitat maintenance. Many biological resources have been impacted by society and have been left in suboptimal conditions. These resources provide services to people and other resources (e.g. forests processing CO2 into O2, avoiding excessive river and lake evaporation, etc). Preserving zoos and aquariums helps to educate the public about the importance of the natural world around us

Department of Education

TABLE 6: COMPOSITION OF SELF-STUDY TEAM

*Membership	Name	Title	Affiliation
School administrator(s)	Edward Biedermann	Principal	UANYHS
CTE teachers	Mauricio Gonzalez	Program Director	UANYHS
CTE teachers	Brendan Malone	CTE Chair	UANYHS
Academic teachers/core subjects	Jeremy Lynch	Teacher	UANYHS
Business/industry partner(s)	James Hall	GIS Consultant	DOE – GIS consultant
Business/industry partner(s)	James Lodge	Project Scientist	Hudson River Foundation
Postsecondary representatives	Michael Judge	Professor and Chairperson	Manhattan College
Guidance personnel	Christopher Budano	College Guidance	UANYHS
Other program stakeholders	Matt Leahey	President	Sea Savers Inc
Other program stakeholders	Philip Orton	Post-Doctoral Research Associate	Stevens Institute of Technology
Other program stakeholders	Dave LaShell	ESRI	Sr. Account Executive
**Frequency of full self-study team and/or sub-group meetings	Full PAC meeting = once a year Sub group meetings = once per week PAC individuals = various (meeting log available)		

**For example, Children's First Network representative, UFT Chapter Leader, representative of students with disabilities, student representative, community representative, parent representative.*

***For example, quarterly or bi-annual meetings with industry and postsecondary partners, weekly/monthly meetings with school level stakeholders.*

Department of Education

TABLE 7: RE-APPROVAL PROGRAM DATA

Programs intending to submit for Re-approval must provide 5 years of data for each of the following items:

Program Data	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Cumulative total
1. How many students have completed the coursework for this program of study since it was last approved or re-approved? Please indicate totals by program year.						
2. Of the total number of students who have completed the coursework for this program of study, how many received special education services (including 504 plans and IEPs)?						
3. How many students completed the technical assessment used in this program?						
4. Of the total number of students who have completed the technical assessment, how many passed?						
5. How many students received a technical endorsement?						
6. How many students who have completed this program participated in work-based learning?						

7. Of the total number of students who have participated in work-based learning, how many participated in the following work-based programs during the approval period?

Cooperative CTE Work Experience Program (CO-OP)		Worksite tours		Job shadowing	
Career Exploration Internship Program (CEIP)		Youth apprenticeships		School-year/summer internships	
General Education Work Experience Program (GEWEP)		Supervised licensed clinical experience (Health Occupations)		Community service/learning	
Work Experience and Career Exploration Program (WECEP)		On-site projects		Other (please explain)	

CTE Program Development Plan

Please use the tables provided to share your goals for program improvements related to curriculum and instruction, work-based learning, assessment and accountability, partnerships, and program and school capacity. Provide plans for projected improvements to be made over the current school year.

<table>
<tr><td colspan="2">Area of Key Priority

☐ Curriculum and Instruction
☒ Work-Based learning
☐ Assessment and Accountability
☐ Partnerships
☐ Program and School Capacity</td></tr>
<tr><td>Outline of actions to be taken:

Action 01: Streamline internship experiences with the program.</td><td>Expected outcomes:

Outcome 01: Activities lead up to internships through well-established partnership with one or more hosts who provide industry-appropriate assignments

Outcome 02: Activities expose students to all aspects of an industry and meet the range of students' needs and aspirations.</td></tr>
<tr><td>Additional support/ resources needed

Will need 3 meetings (45 min each) with the WBL Coordinator.</td><td>Target completion date:

April 2014</td></tr>
</table>

DUPLICATE AS NEEDED

Area of Key Priority	
☒ Curriculum and Instruction ☐ Work-Based learning ☐ Assessment and Accountability ☐ Partnerships ☐ Program and School Capacity	
Outline of actions to be taken: **Action 01:** Align Curriculum Scope and Sequence to Common Core Standards.	**Expected outcomes:** **Outcome 01:** Clear mapping of links between course components and these standards.
Additional support/ resources needed Lists of the standards, lap top, and curriculum crosswalk.	**Target completion date:** June 2014

Area of Key Priority	
☐ Curriculum and Instruction ☐ Work-Based learning ☐ Assessment and Accountability ☐ Partnerships ☒ Program and School Capacity	
Outline of actions to be taken: **Action 01:** Translate all program informational media into Spanish.	**Expected outcomes:** **Outcome 01:** Web page on program information translated to Spanish.

	Outcome 02: Brochures and application materials translated to Spanish.
Additional support/ resources needed Lap top with internet connection, information in English.	**Target completion date:** December 2014

Area of Key Priority ☒ Curriculum and Instruction ☐ Work-Based learning ☒ Assessment and Accountability ☐ Partnerships ☐ Program and School Capacity	
Outline of actions to be taken: **Action 01: Acquire all SPACE GIS materials in order to be able to offer SPACE GIS certification.**	**Expected outcomes:** **Outcome 01:** Acquisition of all SAPCE GIS materials. **Outcome 02:** Students will have the necessary materials to train to qualify for SPACE GIS certification.
Additional support/ resources needed Lap top with internet connection, Series 1/Book 1 – Introduction to GIS/RS Concepts	**Target completion date:** December 2015

Series 1/Book 2 – Introduction to GIS/RS Tools and Processes **USD 3,000.00** Series 2/Book 1 – Advanced GIS Tools and Processes Series 2/Book 2 – Extended Tools in Surface Analysis **USD 2,500.00** Teacher resources (lesson plans, digital presentations, resource CD, dial up tech support **USD 12,000.00** Localized Data **USD 9,000.00**	

Author: Mauricio Gonzalez, M.Sc.
Director, Marine Biology Research Program

Advisor: Edward Biedermann
Principal

Version: 130825

Marine Biology Research Program:
Program Description, Objectives, Expectations, and Sequence

Classification of Instructional Program (CIP) Code

New York State Education Department uses CIP codes to characterize CTE program types. Schools may select from more than 500 unique CIP codes to characterize the program they offer.

3. Use Appendix A to select a CIP code for your program.

Code: **030205** Program: **Water, Wetlands and Marine Resources Management**

Program Name

4. Thinking about the content area and CIP code you selected, create a name for the program.
Marine Biology Research Program

Program Description and Objectives

5. Describe the program.

The Marine Biology Research Program is a 3 yr. program that will jump start high school students in core marine science topics employing hands-on, problem-based learning strategies. Students will begin by building and studying simple aquatic ecosystems; formulate experiments with these systems; learn the biology, chemistry, physics, and ecology behind them; and apply basic instrumentation techniques to monitor them. Once these sets of "in house" skills have been mastered, the program will then shift students' attention to the natural ecosystems around Governor's Island through the formulation of projects around 3 main topics: oyster restoration, habitat characterization, and water/air quality monitoring with a student built and maintained network around the Hudson River Estuary. Students will learn how to formulate projects, submit professional reports, present at national and international research fairs (*e.g.* Intel Science and Engineering Fair), and, ultimately, use their own data to propose resource management solutions to local government agencies. Upon satisfactory completion of this program students will also be

eligible for ***12*** college credits, Geographic Information System map-making ***SPACE*** certification, Natural Resources Systems Management certification, and other professional opportunities that will give them a competitive advantage in college and industry.

6. List the objectives of the program.
   01. Prepare students for resource management and conservation.
   02. Give students a rigorous foundation in marine science.
   03. Expose students to professional settings and careers in marine science.
   04. Prepare students for college with rigorous research projects and college credit bearing courses.
   05. Train students to use cutting edge technology (e.g. remote sensing equipment and Geographic Information Systems).
   06. Characterize Governors Island's marine environment and support the Oyster Restoration Project.

Program Justification

7. Explain how the program meets a particular demand for its students. You may want to describe a demand in the labor force or a benefit to postsecondary education. Use as much data as possible.

   The failure of our urban public schools to produce scientifically literate college bound teenagers reflecting city demographics is well known. Equally disturbing is the lack of representation and participation in STEM (Science, Technology, Engineering and Math) of ethnic groups who are over-represented below the poverty line. Our nations research institutions and private engineering firms increasingly look outside our borders to recruit and hire competent scientists. This program will focus on changing these trends and connect our youth to the skills and knowledge necessary to be competitive in college and enter the STEM fields. The vehicle for this transformation will be student-formulated, problem-based projects that aim to restore NYC's marine resources.

Program Sequence and Credentials

8. List the sequence of courses and the industry-recognized credentials that support those courses.

Grade	Term	Course	Industry-Recognized Credential
9	Fall		
	Spring		
10	Fall	*Introductory Marine Research I **(IntroMarResrchI)	
	Spring	*Introductory Marine Research II **(IntroMarResrchII)	
11	Summer	* Intermediate Research Methods **(IntResrchMeth) ***Intermediate Methods of Science Research	2 college credits – UHS
	Fall	*Intermediate Marine Research I **(InterMarResrchI) ***(UHS - Intermediate Science Research)	4 college credits – UHS

	Spring	*Intermediate Marine Research II **(InterMarResrchII) ***(UHS - Intermediate Science Research)	
12	Summer	* Advanced Research Methods **(AdvResrchMeth) ***Advanced Methods of Science Research	2 college credits – UHS
	Fall	*Advanced Marine Research I **(AdvMarResrchI) ***(UHS - Advanced Science Research)	4 college credits – UHS NOCTI Natural Resources Management SPACE Certification for GIS
	Spring	*Advanced Marine Research II **(AdvMarResrchII) ***(UHS - Advanced Science Research)	

*** DOE/NYHS Course Name**

**** DOE/NYHS Course Abbreviation**

***** SUNY Albany/UHS Course Name**

Core Competencies

9. List all core competencies students will acquire after four years in the program.

Knowledge	General Skills
Project Management	Project formulation, execution, and presentation.
Instrumentation	Technical reading and writing skills.
Zoology	Running and maintaining high tech physical-chemical data retrieval devices and telemetry.
Marine Botany	Designing, building, and maintaining model ecosystems.
Oceanography	Systematics and phylogeny.
Aquatic Chemistry	Population, community, and ecosystem ecology.
Marine Ecology	Lab technology.
Atmospheric science	Lab procedures.
Sampling Methods	Applied ecological statistics.
Ecological data processing, statistics, and analysis	Basic + intermediate general computer technology.
Geographic Information Systems	GIS: Data table build, conversion to points + shape files on map, + spatial analysis.
Resource Management	Natural Resource planning and thematic mapping
Career and Financial Management	Research conservation strategies and advocacy.

Progressive Coursework

10. Organize core competencies into a progression of knowledge and skills by course.

Grade	Term	Course	Knowledge	Skills
9	Fall			
	Spring			
10	Fall	Introductory Marine Research I	Instrumentation; Invertebrate zoology Vertebrate zoology; Marine Botany; Aquatic Chemistry, Basic Chemistry + Physics; Basic Project Management.	Designing, building, and maintaining model ecosystems; basic computer technology, search engine skills, + basic GIS (*i.e.* Google Earth, Google Maps)
	Spring	Introductory Marine Research II	Marine Ecology: population, community, and ecosystem ecology. Evolution; Project Management; Basic Geographic Information System technology	Lab technology skills (i.e. dissection, bacteria culture, microphotography, cell staining; Technical reading and writing; Sampling Techniques; Data table build
11	Fall	Intermediate Marine Research I	Project Management, Instrumentation; Project Management;	Technical reading and writing; Sampling techniques; Geographic identification and manipulation.
	Spring	Intermediate Marine Research II	Project Management, Instrumentation, data table creation + data processing, Basic GIS: Geographic Positioning Systems +	Applied statistics and statistics software (*i.e.* R); project formulation, execution, and presentation; Geographic identification and manipulation; Career and Financial Management
12	Fall	Advanced Marine Research I	Project Management, Instrumentation, Intermediate Geographic Information Systems technology.	Benthos sampling techniques; Conversion of data build into GIS systems; Production of geospatial figures.
	Spring	Advanced Marine Research II	Project Management, Instrumentation; Internship + Professional Skills, Intermediate Geographic Information Systems technology	Research conservation strategies and advocacy; Running and maintaining high tech physical-chemical data retrieval devices and telemetry. GIS spatial analysis.

Once a certificate is issued it appears on the TEACH system and is valid immediately. The effective date is dictated by Department regulations as either February 1 or September 1 of a school year. For a full explanation see the memo dated June 4, 2007 from the Senior Deputy Commissioner of Education.

Person Inquiry

MAURICIO GONZALEZ

Certificates

Description	Effective Begin Date	Effective End Date	Status	Date of Certificate Action
General Science 7-12 Extension Permanent Extension	02/01/2010		Issued	
Biology (Grades 5-9) Professional Certificate	09/01/2010		Issued	
Biology 7-12 Permanent Certificate	02/01/2010		Issued	
Natural Resources & Ecology 7-12 Initial Certificate	02/01/2012	01/31/2017	Issued	
Generalist In Middle Childhood Education (Grades 5-9) Internship Certificate	09/01/2008	08/31/2010	Expired	
Biology & General Science 7-12 Temporary License	09/01/2002	08/31/2003	Expired	
Biology & General Science 7-12 Provisional Certificate	09/01/2004	08/31/2011	Expired	
Biology & General Science 7-12 Limited Certificate	09/01/2003	08/31/2004	Expired	
Students With Disabilities (Grades 5-9), Generalist Internship Certificate	09/01/2008	08/31/2010	Expired	

Done

Author: Mauricio Gonzalez, M.Sc.
Director, Marine Biology Research Program

Advisor: Edward Biedermann
Principal

Version: 131118

RE: Curriculum – Standards Crosswalk

Core Competencies

9. List all core competencies students will acquire after four years in the program.

Knowledge	General Skills
Project Management	Project formulation, execution, and presentation.
Instrumentation	Technical reading and writing skills.
Zoology	Running and maintaining high tech physical-chemical data retrieval devices and telemetry.
Marine Botany	Designing, building, and maintaining model ecosystems.
Oceanography	Systematics and phylogeny.
Aquatic Chemistry	Population, community, and ecosystem ecology.
Marine Ecology	Lab technology.
Atmospheric science	Lab procedures.
Sampling Methods	Applied ecological statistics.
Ecological data processing, statistics, and analysis	Basic + intermediate general computer technology.
Geographic Information Systems	GIS: Data table build, conversion to points + shape files on map, + spatial analysis.
Resource Management	Natural Resource planning and thematic mapping
Career and Financial Management	Research conservation strategies and advocacy.

Progressive Coursework

10. Organize core competencies into a progression of knowledge and skills by course.

Grade	Term	Course	Knowledge	Skills
9	Fall			
	Spring			
10	Fall	Introductory Marine Research I	Instrumentation; Invertebrate zoology Vertebrate zoology; Marine Botany; Aquatic Chemistry, Basic Chemistry + Physics; Basic Project Management.	Designing, building, and maintaining model ecosystems; basic computer technology, search engine skills, + basic GIS (*i.e.* Google Earth, Google Maps)
	Spring	Introductory Marine Research II	Marine Ecology: population, community, and ecosystem ecology. Evolution; Project Management; Basic Geographic Information System technology	Lab technology skills (i.e. dissection, bacteria culture, microphotography, cell staining; Technical reading and writing; Sampling Techniques; Data table build
11	Fall	Intermediate Marine Research I	Project Management, Instrumentation; Project Management;	Technical reading and writing; Sampling techniques; Geographic identification and manipulation.
	Spring	Intermediate Marine Research II	Project Management, Instrumentation, data table creation + data processing, Basic GIS: Geographic Positioning Systems +	Applied statistics and statistics software (*i.e.* R); project formulation, execution, and presentation; Geographic identification and manipulation; Career and Financial Management
12	Fall	Advanced Marine Research I	Project Management, Instrumentation, Intermediate Geographic Information Systems technology.	Benthos sampling techniques; Conversion of data build into GIS systems; Production of geospatial figures.
	Spring	Advanced Marine Research II	Project Management, Instrumentation; Internship + Professional Skills, Intermediate Geographic Information Systems technology	Research conservation strategies and advocacy; Running and maintaining high tech physical-chemical data retrieval devices and telemetry. GIS spatial analysis.

9th Grade CTE Curriculum Crosswalk - Introduction to New York Harbor (Harbor Class)

Ann Fraioli & Jeremy Lynch

Course Philosophy

It is the source of life. It fills us, surrounds us and sustains us. Our very existence depends on it. Since its beginning, human civilization has been shaped by its relation to the Earth's waters. In turn, New York has been built upon its harbor and estuary. In order to understand how human agriculture, transportation, industry and social development are inexorably linked to the waters of New York Harbor students must first understand the science and life of this estuarine environment. This course provides the structure for students to explore in depth the bodies of water they are accustomed to literally only seeing on the surface.

Course Description

As the freshman course for New York Harbor School and as an introduction to the New York harbor and estuary, the following course will focus on a scientific, cultural, historical, and geographic introduction to the New York harbor and the various water bodies that make up the estuary. This course is also the students' introduction to the six Career and Technical Education programs of study: Aquaculture, Marine Biology Research, Marine Systems Technology, Ocean Engineering, Professional Diving, and Vessel Operations.
Students visit different sections of the estuary and meet environmentalists, boat builders, industry personnel, waterfront advocates and others professionals. Students also study specific scientific concepts and compare and contrast the water bodies in terms of their physical make-up, their aquatic life their industry uses and environmental issues.

This course is not a series of field trips. Students explore 14-17 different field locations around the New York Harbor Estuary. These field experiences emphasize the skills of observation and inference, water quality testing and analysis, comparative analysis, perseverance and reflection. This course follows the same rigorous standards as all other classes and is an interdisciplinary course, which covers reading non-fiction, graphing information, the scientific method, and primary source document analysis and interpretation.

As with all Harbor curricula, this course will have the following four goals:

- To use the resources of the harbor and a study of the harbor to teach the content and skills of the core academic classes.
- To use Waterkeeper Alliance and the South Street Seaport Museum as a model for studying, preserving and advocating for the New York City community, and as a model for rigorous teaching and learning.
- To use the resources of the water to better connect students to themselves and to their community.
- To introduce all 9th Graders to the six Career and Technical Education Program of Study.

Course Content – Units of Study

Unit 1 Governors Island
Unit 2 Village Community Boathouse
Unit 3 River Project
Unit 4 Coney Island
Unit 5 American Museum of Natural History
Unit 6 SUNY Maritime
Unit 7 Oysters
Unit 8 Harlem River
Unit 9 Dead Horse Bay
Unit 10 SCUBA
Unit 11 Ocean Engineering and Marine Systems Technology
Unit 12 Industrial Waterfront

Unit 13 Newtown Creek
Unit 14 Bronx River
Unit 15 Gowanus Canal
Unit 16 Schooner Pioneer I
Unit 17 Schooner Pioneer II

Prerequisite Skills – Students Should Be Able To

- Follow directions
- Come prepared with class materials & outdoor equipment

Course Skills – Students Will Be Able To

1. Conduct Scientific Water Quality Studies
2. Perform basic SCUBA skills
3. Perform robotic skills
4. Perform boat handling and navigation skills
5. Perform woodworking skills
6. Perform marine biology dissections and testing
7. Perform oyster farming basics

Unit #: One Unit Title: Introduction to Harbor Class

Course: Introduction to New York Harbor Duration of Unit: 3 Days

DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	I can relate the class expectations to the six pillars of character	Brainstorm and group poster work
HW	I can compose an essay based upon observations and inferences I made at a body of water	Summer Homework Assignment – Essay, observation/inference
Vocab	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	• I can use my five senses to make observations and inferences about Governors Island • I can identify the safety issues around pier and docks	• Observation and inference chart • Short answer lab questions
Station 1	• I can identify marine structures both on a nautical chart and in the harbor • I can safely put on a PFD and board a small boat	• Short answer lab questions • Demonstration of skill
Station 2	I can describe why we test water quality in harbor class	Water quality data sheet
Station 3	I can understand and explain the history of and land expansion on the NY Harbor	Short answer lab questions, map activity
Journal	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	Using my journal entry I can relate the six pillars of character to my experience in the field	Writing extension

Unit Overview	The purpose of this cycle is to introduce students to the habits and procedures of Harbor Class. We will cover the history of Governors Island, introductory nautical chart work, water quality testing methods, and boat safety. We will also teach them how we travel as a class. We will bookend the field experience by relating the six pillars of character to the work that we do in Harbor Class.		
Essential Question(s):	How can I be a contributing member of the Harbor Class community What is expected of me in Harbor Class?		
Common Core / NYS Content Standards	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.	
Content	Small Boat Handling Skills Nautical Chart Basics Water Quality Testing	**Skills**	Nautical Charts – dividers, parallels Journal Writing Water Quality Testing On Water Safety
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	6 Pillars of Character Nautical Chart PFD Metadata Dissolved Oxygen Salinity PH Turbidity
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	MBRP VO
		Texts / Resources	Charts Map of NY/NJ Estuary PFDs Native American History Reading

Unit #: 2 Unit Title: Village Community Boathouse

Course: Harbor Class Duration of Unit: 2 weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can determine the comparative density of fresh and salt water	Density lab

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
HW	2	I can describe salinity and PH levels of the ocean and why they are at particular levels	Reading and Worksheet
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5		
Station 1	6	I can use prior of knowledge of nautical charts to plot a course on the NY Harbor	Village Community Boathouse Lab: Nautical Chart work (dividers, parallels, compasses), Water Quality Testing, Rowing, Journaling
Station 2	7	I can recall the procedure for Water Quality testing from last cycle. I can explain why pH is an important addition to our battery of Water Quality tests	"
Station 3	8	I can build on my small boat knowledge and safely board and disembark a small boat from a ladder	"
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can identify the six CTE programs and categorize the work done in Harbor Class into each program.	Binder work, and check in

Unit Overview	*Today we will work with an organization called Village Community Boathouse (VCB) which is located at Pier 40 on the Hudson River. With the help of their Whitehall gig row-boats, and some volunteers we will learn how to row! We will also continue with our water quality testing and we learn more about navigation and using nautical charts to plot a course, determine location, and spot hazardous areas of the harbor.*	
Essential Question(s):		
Common Core / NYS Content Standards	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

Content	Small Boat Handling Skills Nautical Chart Basics Water Quality Testing	**Skills**	Nautical Charts – Dividers, Parallels, Compasses Water Quality Testing Small Boat Handling Skills – On and Off Water, Positions, Safety
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	**Turbidity** **pH** **Strait** **Coxswain** **Oar** **Gunwale** **Rudder** **Latitude** **Longitude** **PFD**
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	MBRP MST VO
		Texts / Resources	Charts, Maps, Compasses, Dividers, Parallels, Water Quality Kits, PFDs

Unit #: 3 Unit Title: River Project

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can explain the difference between a healthy ecosystem and an unhealthy ecosystem	Group Share Out
HW	2	I can describe a food web and its importance in the harbor	Reading, writing
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5	I can identify the harbor's importance during 9/11	9/11 exhibit and questions
Station 1	6	I can review the purpose and procedure for all Water Quality tests with the help of my small group.	River Project Lab: water quality testing, benthic grab questions, plankton questions, minnow trap questions, journaling

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Station 2	7	I can identify the organisms we retrieve in the minnow traps and the benthic grab.	"
Station 3	8	I can place organisms we encounter today into a local food chain. I can analyze the importance of biodiversity to the estuary food web and ecosystem	"
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can use my knowledge from the field to complete a quiz	River Project Quiz

Unit Overview	*Today we journey back to the West Side of Manhattan to study the Hudson River in greater detail. We will work with an organization called the* **River Project** *to conduct water quality testing and observe aquatic organisms near the piers of the lower Hudson. It's time to get our hands wet!*		
Essential Question(s):			
Common Core / NYS Content Standards	Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy). Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.		
Content	Species Identification Water Quality Benthic Zone id Photic Zone - Plankton	**Skills**	Water Quality Testing Species Identification Phyto vs Zooplankton Identification Understanding of NY/NJ harbor worker's importance during 9/11
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	**native –** **exotic –** **invasive –** **organism –** **invertebrate –** **vertebrate –** **autotroph –** **heterotroph –** **photic zone –**

			biological indicator –
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	MBRP Aquaculture SCUBA
		Texts / Resources	Benthic Grab Plankton Nets Microscopes Slides, pipettes, magnifying boxes Rope Gloves

Unit #: 4 Unit Title: Atlantic Shore

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can identify and describe the features of different aquatic biomes.	Notes, Class Discussion, Field Preparation
HW	2	I can compare and contrast Coney Island pre European and post European contact; the formation and evolution of Coney Island	Reading and questions
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5		
Station 1	6	I can describe what lives in an intertidal zone and why it's unique. I can define adaptation and identify adaptations unique to intertidal organisms.	Atlantic Shore Lab, water quality testing, beach combing and fish identification, Coney Island history and photography, aquarium tour and student work (lab)
Station 2	7	I can define and provide examples of invasive species. I can classify different organisms according to biological classification systems	"
Station 3	8	I can complete water quality testing with my peer group	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can assess my own knowledge of aquatic biomes, adaptation, native vs invasive species, and biological classification systems	Wrap up Notes, Quiz

Unit Overview	*This cycle we will visit the New York Aquarium, which is located next to Coney Island and the Atlantic Ocean. In the Aquarium we will be observing many species of organism in exhibits that represent their natural habitat. We will be testing the water quality of the Atlantic Ocean so that we can compare it to the water quality of the New York Harbor Estuary. On the Coney Island Beach we will collect and identify as many different kinds of organisms as we can find.*		
Essential Question(s):			
Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.	
Content	Seining for species Species Identification Aquarium Visit Coney Island Geography and History Coney Island Photography and Imagery Throughout History	**Skills**	Water Quality Testing Species Identification Understanding of CI History Photography Observation/Inference Journal Writing Image evaluation
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	**adaptation –** **biodiversity –** **biome –** **ecosystem –** **community –** **population –** **habitat –** **niche –** **sessile –** **substrate –**
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	MBRP Aquaculture

		Texts / Resources	Seine Net Rubber Boots Cameras Images Water Quality Bag

Unit #: 5 Unit Title: American Museum of Natural History

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can compare and contrast land biomes and aquatic biomes	Biome exercise ('round the room) and notes
HW	2	I can define biome and discuss factors that affect them	Reading and questions
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5		
Station 1	6	I can identify organisms and use museum resources to learn about new ones I can define biodiversity I can classify organisms according to biological similarities	AMNH lab, Biological Classification, Aquatic Ecosystem Compare and Contrast, Land Biome Reading and Comparison to Aquatic Biomes
Station 2	7	I can compare the estuary ecosystem to other aquatic ecosystems I can decipher important information in museum exhibits	"
Station 3	8	I can complete water quality testing with my peer group	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can use my knowledge from the field to further understand and identify land and aquatic biomes	Quiz, wrap-up discussion and notes

Unit Overview	*This cycle we will visit the Museum of Natural History where we will visit the Hall of Biodiversity and the Hall of Ocean Life. You will see a tropical rainforest and visit the biomes of the world. You will continue to learn about the scientific classification (taxonomy) of life and explore the deepest reaches of the ocean. Enjoy!*
Essential Question(s):	

Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.	Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).	
Content	Classification of species Biomes Biodiversity of the oceans	**Skills**	Water Quality Testing Observation/Inference Journal Writing Classification
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	**biodiversity –** **biome –** **continental shelf –** **overharvest –** **extinct –** **endangered –** **threatened –** **colony –** **taxonomy –** **scientific name –**
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	MBRP Aquaculture SCUBA Ocean Engineering
		Texts / Resources	Flashlights Water Quality Bag Poster Paper Markers

Unit #: 6 Unit Title: SUNY Maritime

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can describe the programs and types of degrees offered at SUNY Maritime. I can create a kwl sheet listing what I know, want to know, and (during post) learned about SUNY Maritime	KWL Sheet, group reading and discussion

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
HW	2	I can summarize the types of jobs I can get and the qualifications I need to work in the shipping/boating industry	Reading and questions
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5	I can describe the admissions requirements at SUNY Maritime	Question and answer period
Station 1	6	I can describe the IALA "B" buoyage system I can identify lateral, cardinal, safe water, danger, and special marks (buoys)	SUNY Maritime Lab, Water Quality Data Sheet, Hands on knot tying, Buoyage IALA "B" discussion
Station 2	7	I can tie a square knot, a bowline knot, and a sheet bend	"
Station 3	8	I can complete water quality testing with my peer group	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can describe the steps necessary to obtain a TWIC and MMC credential I can explain the median wages of engineers, operators, captains, mates and pilots, as well as oilers and sailors. I can organize the work in my binder I can refer back to the work in my binder I can analyze the water quality temperature trends from this fall	Quiz

Unit Overview	*This cycle we will visit SUNY Maritime, a college under the Throgg's Neck Bridge in the Bronx. Today you should start thinking about where you would like to go to college and what you would like to study. We will be getting a tour, meeting some of the professors and testing the Water Quality right next to Long Island Sound! Be sure to look back at your questions from yesterday, so you can get them answered today.*	
Essential Question(s):		
Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.	Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

Content	Knot Tying Buoyage Systems Water Quality Testing	**Skills**	Water Quality Testing Observation/Inference Journal Writing Basic Knot Tying Buoyage System
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	**cadet –** **regiment –** **MMC –** **TWIC –** **line –** **sound –** **hypoxia –**
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	VO OE MST
		Texts / Resources	Water Quality Bag Dividers, Compasses, Parallels Buoyage Systems Manual

Unit #: 7 Unit Title: Oysters

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can define keystone species I can recognize the Eastern Oyster to be a keystone species due to their role in providing valuable shelter & habitat for many other estuarine organisms, improving water quality, and reducing bank erosion	Keystone Species notes, classroom discussion
HW	2	I can interpret images to describe the oyster's importance in early NY history	Reading, images, questions
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5		
Station 1	6	I can describe oysters as bivalve mollusks that live in marine & brackish habitats I can identify the range and habitat of the Eastern Oyster.	Oyster Lab, Water quality testing, Oyster identification and biology, Building a filter project, The Big

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
		I can describe oyster feeding habits I can draw & explain the life cycle of an oyster. I can describe the method of reproduction associated with the Eastern Oyster.	Oyster reading, Oyster reef building project, journal write
Station 2	7	I can explain the ecological value of oyster reefs. I can identify factors that have led to the decimation of local oyster reefs. (Overharvesting, habitat loss, sedimentation & pollution).	"
Station 3	8	I can complete water quality testing with my peer group	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can define why oysters are both a historical and ecological keystone species	Quiz/Assessment, wrap-up notes and classroom discussion.

Unit Overview	***"Obviously, if you don't love life, you can't enjoy an oyster." – Eleanor Clark, writer, scientist, 1959.***		
Essential Question(s):			
Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or athematically (e.g., in an equation) into words.	
Content	Oyster Reef Biology Oyster Measuring Oyster Care Oyster Importance Oyster as a Filter	**Skills**	Water Quality Testing Observation/Inference Journal Writing Oyster Measurement Oyster Filter Contest Eat an Oyster!

Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	**oyster reef –** **restoration –** **spawn –** **spat –** **mollusk –** **bivalve –** **siltation –** **dredge –** **keystone species –** **bioindicator –**
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	Aquaculture SCUBA MBRP
		Texts / Resources	Oyster Filter Materials Calipers Water Quality Bag Oyster Nets

Unit #: 8 Unit Title: Harlem River

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1		
HW	2	I can demonstrate knowledge of how our water is treated. I can define CSO and discuss why CSOs are such an issue in NYC	Reading and questions
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5		
Station 1	6	I can define solid waste and provide several examples. I can differentiate between sanitary landfills and open dumps. I can identify some of the major concerns associated with solid waste (i.e. pollution, decomposition, finite natural resources, space, etc)	Harlem River Lab, Water Quality Testing, Guided nature walk, CSO sketch & identification, journal write
Station 2	7	I can identify the Combined Sewer System (CSS) as the one implemented by NYC to deal with wastewater. I can explain what Combined Sewer Overflow (CSO) is and describe when & why it happens. I can describe the importance of salt marsh habitats to native organisms.	"

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Station 3	8	I can complete water quality testing with my peer group	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can describe the difference between renewable and nonrenewable resources I can explain what happens to my sewage when I flush the toilet or use the shower. I can compare what happens to sewage on a dry day versus a rainy day.	Notes based on video. Participation in CSO model activity. Notes & sketch based on CSO model.

Unit Overview	*This cycle we will focus on three main topics: restoration in New York City, salt marshes and CSOs (Combined Sewer Overflows). We will go up to the Harlem River in Manhattan where we will visit Swindler Cove Park and Sherman Creek, two areas that used to be illegal, open dumps, but have been restored as natural parks.*		
Essential Question(s):			
Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.		
Content	CSO Identification Landfill vs Open Dump Restoration	**Skills**	Water Quality Testing Observation/Inference Journal Writing CSO Sketch CSO Identification
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	**sewage treatment plant –** **sewer –** **combined sewer –** **effluent –** **dry weather overflow –** **wastewater –** **urban runoff -** **nutrients –** **pathogen –** **floatable –**

Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	MBRP Aquaculture
		Texts / Resources	Water Quality Bag Boots, Jackets, other Hiking Gear

Unit #: 9 Unit Title: Dead Horse Bay

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1		
HW	2	I can describe the history of Dead Horse Bay	Reading and questions
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5		
Station 1	6	I can define wetlands and differentiate between various types of wetlands. I can draw connections between wetlands and solid waste disposal. I can explain what ecological succession is and give examples of specific pioneer species found at DHB. I can identify native and invasive species at Gerritsen's Creek and DHB. I can explain plant adaptations that estuarine species of DHB have to deal with in terms of coastal ecology (i.e. high salt concentrations, daily temperature fluctuations, seasonal climate change, tides, etc)	Dead Horse Bay Lab, Water Quality Testing, beachcombing, Salt Marsh guided hike, species identification, journal write
Station 2	7	I can describe what a dune is and explain its ecological significance. I can define erosion and provide specific examples of agents of erosion (i.e. wind, water, tides, etc) I can describe why Phragmites and American Beach Grass are important for the ecology of the salt marsh.	"
Station 3	8	I can complete water quality testing with my peer group	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can connect what I observed at the Dead Horse Bay landfill with my own habits as a consumer. I can compare New York's garbage removal from the 19th century to the	Notes based on powerpoint and video.

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
		present. I can differentiate between reduce, reuse, recycle	

Unit Overview	*This cycle we will be visiting an example of the wetland biome out near Jamaica Bay. In the past this area was mostly covered in **Salt Marshes**. Today, due to development, there are very few wetlands left in New York City. We will be studying the significance of wetlands past and present for both people and wildlife.*		
Essential Question(s):			
Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.		
Content	Invasive versus native species Species Identification Understanding Landfills Erosion Dunes and Issues related to	**Skills**	Water Quality Testing Observation/Inference Journal Writing Species ID Invasive and Native Species ID
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	**landfill –** **succession –** **erosion –** **beach –** **dune –** **native species –** **exotic species –** **invasive species –** **pioneer species –** **salt marsh -**
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	MBRP SCUBA

		Texts / Resources	Water Quality Bag Outdoor Gear Species Images Gloves

Unit #: 10 Unit Title: SCUBA

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can be prepared to go into the pool. I can watch the PADI video and answer multiple-choice questions.	Multiple choice questions
HW	2	I can summarize basic SCUBA safety protocols	Reading questions share out
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5		
Station 1	6	I can assemble the tank, regulator and BCD I can follow the proper safety procedures in and around the pool I can listen to an industry professional and describe his work	Discovery Dive Lab, journal write
Station 2	7	I can clear my mask I can breathe underwater I can follow directions given by the SCUBA instructor	"
Station 3	8	I can complete water quality testing with my peer group	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can recall the steps of putting together and donning my scuba equipment	Quiz

Unit Overview	*Today we are going to the Bushwick High School Campus to use the pool and learn about our Professional Diving Program here at Harbor School. We will also meet Lenny Speregen, a commercial diver here in New York Harbor.*
Essential Question(s):	

Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.		
Content	SCUBA Dive SCUBA Basics SCUBA Professional Opportunities	**Skills**	Water Quality Testing Observation/Inference Journal Writing SCUBA Basics SCUBA Jobs Knowledge
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	**CTE –** **SCUBA –** **BCD –** **SPG –** **buoyancy –** **atmospheric pressure –** **equalize –** **ascend/descend –** **gauge –** **purge valve –**
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	SCUBA
		Texts / Resources	SCUBA Gear PADI Dive Literature Lenny and Equipment

Unit #: 11 Unit Title: Ocean Engineering & Marine Systems Technology

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1		
HW	2		
Voc	3	I can record and memorize key terms that will be used throughout the	Vocabulary work

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
ab		year in Harbor Class	
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5		
Station 1	6		
Station 2	7		
Station 3	8	I can complete water quality testing with my peer group	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10		

Unit Overview			
Essential Question(s):			
Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.		
Content		**Skills**	Water Quality Testing Observation/Inference Journal Writing

Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	
		Texts / Resources	

Unit #: 12 Unit Title: Industrial Waterfront

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can analyze the evolution of New York's Industrial Waterfront over time through the use of historic documents I can describe how the Brooklyn Navy Yards are using green technology to change the face of the area	Document Based Questions, historic maps, observation and inference small group work
HW	2	I can describe how the Navy Yards are using green technology to revamp the area	Reading and questions
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5		
Station 1	6	I can compare the Brooklyn Navy Yard to the Atlantic Basin Terminal I can compare the landfill at Brooklyn Navy Yard to the landfill in Lower Manhattan and Governors Island I can compare the past uses of the Navy Yard to the present uses	Port Authority Lab, Water Quality Data Sheet, dry dock flip book, journal write
Station 2	7	I can describe the various jobs available at shipping ports I can analyze pilings for evidence of marine borers I can assemble a flip book	"
Station 3	8	I can complete water quality testing with my peer group	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Post	10	I can show the similarities and differences between the Brooklyn Navy Yards and the Brooklyn Marine Terminal	Comparing and contrasting historic maps, political cartoons and writings

Unit Overview	*Today we will visit two industrial waterfronts: The Port Authority's Atlantic Basin and the Brooklyn Navy Yard. As you learn about these two places think about the similarities and differences that you see. Why did these areas become and remain industrial (as opposed to recreational or commercial)?*		
Essential Question(s):			
Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.		
Content	Water Quality Testing Shipping Industry Standards Shipping Industry Security Naval History Navy Yards Past and Present Navy Yards Impact on NYC	**Skills**	Water Quality Testing Observation/Inference Journal Writing Security Training Historic Fact Find
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	**Port Authority of NY & NJ –** **container –** **containerization –** **Marsec –** **Dry dock –** **Stewardship –** **sustainability –** **Green building –** **LEED –**
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	VO MST

		Texts / Resources	Security Training Video Dry Dock pictures Water Quality Bag

Unit #: 13 Unit Title: Newtown Creek

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can analyze a Document Based Question and make inferences based upon its content I can observe primary source documents and record what I see I can analyze primary source documents to better understand the development of Newtown Creek	Ppt notes, DBQ group work DBQ individual work
HW	2	I can compare the former uses of Newtown Creek to the current ones and discuss environmental issues that reflect this usage	Reading Heartbeats in the Muck and questions
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5		
Station 1	6	I can analyze charts to describe how Newtown Creek has changed over time	Water Quality Data Sheet, Newtown Creek Lab, Chart Work, Map Work
Station 2	7	I can identify CSOs and SPEDES I can identify possible unchecked pollution issues along the shoreline of Newtown Creek.	"
Station 3	8	I can complete water quality testing with my peer group	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can use the same primary source documents to write a dbq essay about how the Newtown Creek has changed over the last 400 years	DBQ Essay

Unit Overview	*Today we will be exploring the Newtown Creek & you never know what you may see! We will be joined by staff from the U.S. Merchant Marine Academy at Kings Point. We will be helping out our local Hudson Riverkeeper by patrolling Newtown Creek and looking for possible pollution issues.*

Essential Question(s):			
Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.		
Content	Chart Work Map Work History of Newtown Creek Present Uses of Newtown Creek Boat Driving Basics Water Quality Comparison	**Skills**	Water Quality Testing Observation/Inference Journal Writing Basic Boat Handling Skills Chart work Map Work
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	creek – groundwater – aquifer – seepage – refinery – plume – SPDES – litigation – remediation – grassroots –
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	VO MBRP
		Texts / Resources	Charts, compasses, dividers, parallels, Water Quality Bag, Weights, Historic maps of Newtown Creek

Unit #: 14 Unit Title: Bronx River

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can draw the water cycle I can explain how water moves through a watershed	Water cycle, ppt notes,
HW	2	I can describe the biology of a squid	Reading and diagram
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5		
Station 1	6	I can describe one way that Rocking the Boat and other community organizations are restoring the Bronx River to its original state I can compare the Bronx River to the other industrial waterfronts we have visited	Water quality data sheet, Bronx River Lab
Station 2	7	I can I can row a 15 foot gig with a row in each hand	
Station 3	8	I can complete water quality testing with my peer group I can explain the importance of nutrient testing I can follow the directions and complete a nutrient test kit	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can use the watershed model to demonstrate how different types of pollution move through a watershed I can dissect a squid and describe its external and internal parts (happening in pre for some sections, post for others)	Watershed model activity sheet, squid dissection, squid homework

Unit Overview	*Today we will be traveling to the Bronx River. It's a long ride on the subway so we will be doing our independent reading AND reading an article about the Bronx River. When we arrive at the Bronx River we will meet some people that work for an organization called Rocking the Boat. With their help we will continue our investigation of charts and maps and, of course, Water Quality! Finally, we will row out on the Bronx River to see how the industry and restoration compares to Newtown Creek.*	
Essential Question(s):		
Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.	

Content	Rowing Whitehall Gigs Species Identification Restoration Chart Work Water Quality	**Skills**	Water Quality Testing Observation/Inference Journal Writing Single Oar Rowing Nutrient Testing Chart Work
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	water cycle – watershed – reservoir – effluent – primary productivity – nutrients – limiting nutrient – algal bloom – wading birds – diving birds –
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	MBRP VO
		Texts / Resources	Water Quality Bag Charts, dividers, parallels, compasses PFDs Nutrient Testing Kit

Unit #: 15 Unit Title: Gowanus Canal

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can analyze documents related to the Gowanus Canal and answer questions, write a paragraph, interpret data	4 Stations – Data Interpretation, Paragraph Writing, Short Answer Questions
HW	2	I can explain the historic uses, pollution of, and current uses/ pollution of the Gowanus Canal	Reading and questions
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5		
Stati	6	I can paddle a small skiff	Water Quality Data Sheet, Gowanus

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
on 1		I can safely embark and disembark from the shore I can identify the impact of CSOs on the Gowanus Canal ecosystem	Canal Lab
Station 2	7	I can compare the industrial uses and restoration of the Gowanus Canal to other sites we have visited I can label a map of the Gowanus Canal using my powers of observation	Water Quality Data Sheet, Gowanus Canal Lab
Station 3	8	I can complete water quality testing with my peer group I can complete nutrient testing with the help of my peers	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can consolidate and analyze the information that I collected at the Gowanus and consolidate it on a single map, labeling it appropriately	Gowanus Map

Unit Overview	*Today we will be traveling to the Gowanus Canal. We will start our day on land learning about another type of row boat built by Marine Systems Technology students. In the afternoon we will all go paddling on the canal in small boats, do water quality, and learn about the Clean Water Act.*		
Essential Question(s):			
Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.		
Content	Gowanus Canal Small Skiff Rowing Gowanus History EPA History Superfund Site History Clean Water Act	**Skills**	Water Quality Testing Observation/Inference Journal Writing Small boat handling EPA, CWA, Superfund knowledge

Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	urban – canal – bulkhead – CSO – bio-solid / sludge – stench – conservation – stewardship – biotic factors – abiotic factors –
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	VO MBRP MST
		Texts / Resources	Gowanus Historic Maps Small Boats PFDs Charts Readings – CWA, EPA, Superfund

Unit #: 16 Unit Title: Schooner Pioneer I

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can take notes and describe why we test for fecal coliform in the NY Harbor Estuary	Fecal Coliform Notes
HW	2	None	None
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5	I can describe where and why mechanical advantage is used on a ship I can compare the effectiveness of different hull types in terms of carrying heavy loads	
Station 1	6	I can tie standard boating knots I can use past nautical chart knowledge to plot a course	Square knot, figure 8 knot, bowline knot, Pioneer lab, wq data sheet, raise sails
Station 2	7	I can stand bow watch I can steer the boat with the help of the captain I can listen to the commands of the crew and be part of a team to raise sails	"
Station 3	8	I can complete water quality testing with my peer group	Water Quality Data Sheet

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can write a formal thank you letter to one of our partners	Formal thank you letter

Unit Overview	*Sailing season is upon us! This trip you will be sailing aboard the* Pioneer*, a very special historic ship that was built in 1885. Today you will learn the basics of how to sail the Pioneer. We will also focus on topics that are related to the Vessel Operations CTE Program.* ***Always be attentive and listen to instructions from the crew!***		
Essential Question(s):			
Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.		
Content	Advanced Knots Advanced Charts Advanced Navigation Raising Sails Bow Watch Steering the Ship	**Skills**	Water Quality Testing Observation/Inference Journal Writing Large boat handling skills Knots Charts Bow Watch Sail raising
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	**forward –** **aft –** **sail –** **mast –** **main mast –** **foremast –** **mainsail –** **foresail –** **staysails –** **boom –** **gaff –** **schooner –** **lines –** **halyard –** **sheet –**

Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	VO MST MBRP
		Texts / Resources	Charts Line

Unit #: 17 Unit Title: Schooner Pioneer II

Course: Harbor Class Duration of Unit: 2 Weeks

DAY	DAY	DAILY LEARNING TARGET	STUDENT WORK PRODUCT
Pre	1	I can be attentive to and take notes on CTE presentations	CTE presentations
HW	2	None	None
Vocab	3	I can record and memorize key terms that will be used throughout the year in Harbor Class	Vocabulary work
Prep	4	I can demonstrate that I am prepared to go out on a day long field experience	Gear check-off
Intro	5	I can compare the water quality parameters of surface and bottom water	
Station 1	6	I can work as a team to deploy a trawl net I can use a dichotomous key to identify fish of the NY Harbor	Pioneer Lab, WQ data sheet, trawling net and fish identification, raise sails, fecal coliform test
Station 2	7	I can listen to the commands of the crew and be part of a team to raise sails I can use past knowledge to identify phyto and zooplankton	"
Station 3	8	I can complete water quality testing with my peer group I can test for fecal coliform	Water Quality Data Sheet
Journal	9	I can relate my Harbor Class field experience to past learning experiences	Journal writing
Post	10	I can explain my top CTE choice in writing	CTE preference form

Unit Overview	*Good Morning, Crew! We are back sailing and you are almost finished with your freshman year. Today we are going to do our last round of water quality, go fishing with a trawl net and practice some more advanced knots. All station questions are four points each. Work hard and enjoy your last Harbor Class field experience. Anchors Away!!*

Essential Question(s):			
Common Core / NYS Content Standards	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.		
Content	Fish Identification Fish Trawl Water Quality Testing Plankton ID Sail Raising	**Skills**	Water Quality Testing Observation/Inference Journal Writing Plankton ID Raising Sails Trawl Net Fishing Harbor Species ID
Formative Assessments	Daily Check Off Vocabulary Check Subway Reading Check Do Now Check Off	**Key Vocabulary**	Leave a lane! – No Hands – Five Minutes!! – Water Quality bag – Favorite place to "Muster!" – Favorite school lunch item – Layers – Jacket – Drop the Line – Haul Away –
Summative Assessment	Lab Journal Writing	**Modifications / Extensions / CTE Focus**	VO MBRP MST Aquaculture
		Texts / Resources	Trawl Net Tanks Foul Weather Gear Water Quality Bag

Wk-Dy (lesson)	**Topics**	**Learning Targets**	**Activities**	Student Work Products + **HW**	**NYS CDOS Learning Standards**	**NYS Standards** for Mathematics, Science, and Technology	**Common Core Standards** W=Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6–12 R=Reading Standards for Literacy in Science and Technical Subjects 6–12
01-001 (a)	Intro. to Marine Biology	I can understand the importance and benefits of the MBRP.	Theory + Q&A	Program materials. **Create professional e-mail and obtain course materials by Monday**	Standard 1: Career Development Standard 3b: Career Majors		W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
01-002 (b)	Intro. to Marine Biology	I can distinguish Marine Biology from the science of Biology.	Comparison of Marine Biology and Biology	Venn diagram comparing biology and marine biology	Standard 1: Career Development Standard 3b: Career Majors	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
02-003 (a)	Project Management	I can list and describe the 4 main types of research projects.	Theory + Journal entries	List and description of the 4 main types of research projects.	Standard 3a: Universal Foundation Skills		W2d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
02-004 (b)	Project Management	I can describe the main lab and school safety procedures.	Lab safety	Matching of safety symbols with lab scenarios.	Standard 3a: Universal Foundation Skills		W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

02-005 (c)	Scientific Methods	I can use the scientific method to solve a problem. Part I	Scientific Methods Exercise	Hypothesis formulation scientific method stick (SMS).	Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
02-006 (d)	Scientific Methods	I can use the scientific method to solve a problem. Part II	Scientific Methods Exercise	Inquiry questions for SMS.	Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
02-007 (e)	Scientific Methods + GIS	I can describe the steps to writing a lab report.	Scientific Methods Exercise	Lab report for SMS that includes locality map generated using web based GIS technology (i.e. Google Maps/Earth).	Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	W8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
Alt.	Project, Career, and Financial Management	I can use career and financial management skills to build a **wind racer**.	Apply career and management skills learned earlier to building a wind racer.	[Wind racer budget]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
Alt.	Project, Career, and Financial Management	I can use career and financial management skills to build a **wind racer**.	Apply career and management skills learned earlier to building a wind racer.	Application of business function and financial and human resources to building a wind racer	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
Alt.	Project, Career, and Financial Management	I can use career and financial management skills to build a **wind racer**.	Apply career and management skills learned earlier to building a wind racer.	Wind racer	Standard 2: Integrated Learning Standard 3b: Career Majors		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or

							performing technical tasks, attending to special cases or exceptions defined in the text.
Alt.	Project, Career, and Financial Management	I can use career and financial management skills to build a **wind racer**.	Apply career and management skills learned earlier to building a wind racer.	Wind racer	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
Alt.	Project, Career, and Financial Management	I can race a **wind racer**.	Race the wind racers	Wind racer velocity and position data	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
Alt.	Project, Career, and Financial Management	I can trouble shoot and explain the limitations of a **wind racer**.	Trouble shoot and present limitations of the wind racers	Wind racer modifications	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		
03-008 (a)	Project Management	I can correctly format my research journal.	Procedures Lecture	Correctly formatted research journal.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-009 (b)	Technology	I can manage my digital information. Part I	Computer Information Technology	Properly created and named digital files.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-010 (c)	Technology	I can manage my digital information. Part II	Computer Information Technology	Navigate through Windows Explorer.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-011 (d)	Technology	I can describe the importance of and create a professional e-mail address.	Computer Information Technology	Creation of a professional e-mail address.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions

							defined in the text.
03-012 (e)	Lab Techniques	I can describe the difference between disinfecting and sterilizing.	Procedures Lecture	Journal entry contrasting sterilization and disinfection.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
04-013 (a)	Lab Techniques	I can disinfect research equipment. Part I	Disinfecting and Lab Techniques	Disinfecting Aquatic Ecosystem Model (AEM) parts.	Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
04-014 (b)	Lab Techniques	I can disinfect research equipment. Part II	Disinfecting and Lab Techniques	Removing chlorine from AEMs.	Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
04-015 (c)	Lab Techniques	I can disinfect research equipment. Part III	Disinfecting and Lab Techniques	Removing vinegar from AEMs.	Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-016 (a)	Introductory Science	I can describe the origin and attributes of the Universe.	Theory + Patterns Recognition	Development of a creation myth of the Universe.	Standard 1: Career Development Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	W2b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
05-017 (b)	Introductory Science	I can describe how patterns are found through the levels of organization.	Theory + Patterns Recognition	Relation of the levels of organization to careers in science.	Standard 1: Career Development Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.

05-018 (c)	Hydroponics	I can germinate seeds hydroponically. Part I	Hydroponics	Preparation of germinating substrates.	Standard 1: Career Development Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-019 (d)	Hydroponics	I can germinate seeds hydroponically. Part II	Hydroponics	Preparation of hydroponic germination tray.	Standard 1: Career Development Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-020 (e)	College Awareness	I can describe what I need to do in high school to graduate from college.	Independent reading and small group share	Summary using Active Note Taking strategies + notes from student comments	Standard 1: Career Development Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R9. Draw evidence from informational texts to support analysis, reflection, and research.
06-021 (a)	Introductory Science	I can explain how patterns inhabit nature.	Theory + Patterns Recognition	Creation of a pattern model.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
06-022 (b)	Introductory Science	I can explain how symmetry inhabits nature.	Theory Lecture	Creation of a model of symmetrical organism.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
06-023 (c)	Introductory Science	I can explain how matter makes patterns to create living things.	Theory Lecture	Description of the progression between elements and living things.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.

06-024 (d)	Introductory Science	I can explain how patterns are used to protect and support living things.	Theory Lecture	Comparison between the skeletons of various organisms.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R9. Draw evidence from informational texts to support analysis, reflection, and research.
07-025 (a)	Aquatic Chemistry	I can explain what pH is.	Theory Lecture	Explanation of how hydrogen and hydroxide ions affect pH.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R9. Draw evidence from informational texts to support analysis, reflection, and research.
07-026 (b)	Instrumentation	I can use a digital pH sensor.	pH Measurements with Digital Meters and Graphing of various solutions and locations	Correct use of a Hanna Combo Sensor for pH.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
07-027 (c)	Instrumentation	I can measure the pH of various solutions and locations.	pH Measurements with Digital Meters and Graphing of various solutions and locations	Measurement, recording, and graphing of the pH of various solutions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
07-028 (d)	Aquatic Chemistry	I can determine the buffering capacity of filtered water and seawater.	pH Measurements of filtered and sea water while adding a strong acid	Graphs of pH curves of different solutions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
07-029 (e)	Statistics	I can use graphs to find patterns and predict nature (MLP 01: figure of East vs. West side pH of GI).	Class analysis of graphs; (MLP 01: BONUS: creation of map using Google Earth for East vs. West side pH values @ GI).	Analysis of pH curves of different solutions (MLP 01: figure of East vs. West side pH of GI).	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to

							aiding comprehension.
08-030 (a)	Aquatic Chemistry	I can explain how electrical conductivity relates to plant nutrition.	Theory Lecture	Journal entry explaining relationship between EC and nutrient salts.	Standard 2: Integrated Learning	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R9. Draw evidence from informational texts to support analysis, reflection, and research.
08-031 (b)	College Awareness	I can prepare for college reading literature on college readiness.	Reading, Summarizing using Active Note Taking	Article summary using Active Note Taking strategies.	Standard 1: Career Development		R9. Draw evidence from informational texts to support analysis, reflection, and research.
08-032 (c)	Aquatic Chemistry	I can process pH data using averages, tables, and graphs.	Data Processing	Analysis of data.	Standard 1: Career Development Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R9. Draw evidence from informational texts to support analysis, reflection, and research.
08-033 (d)	Instrumentation	I can measure the electrical conductivity of a solution.	Instrumentation techniques	Correct use of Hanna Combo Sensor for EC.	Standard 1: Career Development Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
08-034 (e)	Instrumentation	I can adjust the nutrient content of a solution.	Instrumentation techniques	Adjusted nutrient solution for hydroponic seed germination.	Standard 1: Career Development Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
09-035 (a)	Ecosystem Ecology	I can explain how nutrients affect aquatic ecosystems.	Theory Lecture	Description of effects and solutions to excess nutrients in aquatic ecosystems.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R9. Draw evidence from informational texts to support analysis, reflection, and research.
09-036 (b)	Ecosystem Ecology	I can trace how nitrogen cycles through the environment.	Draw the path of N in an ecosystem.	Drawn path of N in an ecosystem.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R9. Draw evidence from informational texts to support analysis, reflection, and research.

09-037 (c)	Aquatic Ecosystem Modeling	I can begin building the foundation of an AEM.	Lab Techniques	Begin assembling AEM - substrates.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
09-038 (d)	Project Management	I can create a data table using Microsoft Word. Part I	Software Technology	Data table.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
09-039 (e)	Project Management	I can create a data table using Microsoft Word. Part II	Software Technology	Data table.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
10-040 (a)	Aquatic Chemistry	I can compare the nutrient content of filtered, HRE, and AEM water.	Nutrient Measurements and comparison between ammonia and nitrate levels in an Aquatic Ecosystem Model	Measure Buffering Capacity, Nitrites, Nitrates, and pH of AEM + preparation of a lab report written backwards.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
10-041 (b)	Aquatic Chemistry	I can compare the ammonia levels of filtered, HRE, and AEM water.	Nutrient Measurements and comparison between ammonia and nitrate levels in an Aquatic Ecosystem Model	Measure and record the ammonia levels of various solutions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
10-042 (c)	Aquatic Chemistry	I can monitor the relationship between ammonia and nitrates in an AEM. Part I	Nutrient Measurements and comparison between ammonia and nitrate levels in an Aquatic Ecosystem Model	Add ammonia + Nitrifying bacteria to AEM	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
11-043 (a)	Aquatic Chemistry	I can monitor the relationship between ammonia and nitrates in an AEM. Part II (MLP 02: graph ammonia vs. nitrite vs.	Nitrogen monitoring in AEM with Colorimetric Test Strips	Nitrogen curve in AEM. (Assign MLP 02)	Standard 2: Integrated Learning Standard 3a: Universal		R3. Follow precisely a complex multistep procedure when carrying out

		nitrate levels in the AEM).			Foundation Skills		experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
11-044 (b)	Aquatic Chemistry	I can trace the path of Carbon in an ecosystem.	Theory Lecture	Model path of C in an ecosystem.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
11-045 (c)	Aquatic Chemistry	I can explain how some nutrients are limiting factors for marine organisms.	Theory Lecture	List different nutrients in ecosystems.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
11-046 (d)	Aquatic Chemistry + Instrumentation	I can describe how phosphate cycles through an ecosystem.	Phosphate monitoring in AEM with Colorimetric Test Strips	Monitor and record the phosphate levels of various solutions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
11-047 (e)	Aquatic Chemistry + Instrumentation	I can monitor and adjust the Buffering Capacity of an AEM?	Add sodium bicarbonate to AEMs to increase buffering capacity and raise pH	Journal, monitor and adjust physical chemical properties.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
12-048 (a)	Project Management	I can begin to search for a research topic. Step 01 (MLP 03 – Search for 2 media sources for each of your 3 main topics, summarize them, and submit them in order of interest) – due week 17	Research Topic Search	Complete Step 01 of research process. (MLP 03 – Search for 2 media sources for each of your 3 main topics, summarize them, and submit them in order of interest) – due week 17	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		
12-049 (b)	Aquatic Chemistry	I can describe the origin of the hydrosphere.	Ecosystem Theory	Describe the origin of the hydrosphere.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 4: Students will understand and apply scientific concepts, principles,	W10. Write routinely over extended time frames (time for reflection and revision) and

						and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
12-050 (c)	Aquatic Chemistry	I can monitor the AEM.	Monitor AEM	Journal, monitor and adjust physical chemical properties.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		W2a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
13-051 (a)	Project Management	I can begin the project literature review. Step 02	Literature Review	Complete search query and find 6 sources, two for each of the three topics chosen in Step 01.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		R10. By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.
13-052 (b)	GIS	I can tour different marine ecosystems on Google Earth.	Ecosystem Theory and search using GE (discuss point, line, polygon attributes)	Venn diagram with different ecosystems (discussion of point, line, + polygon attributes).	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
13-053 (c)	Aquatic Ecology	I can trace the flow of matter and energy in an ecosystem.	Ecosystem Theory	Food web of marine organisms.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
13-054 (d)	Aquatic Chemistry	I can relate alkalinity and hardness to pH.	Lab Techniques with Colorimetric Test Strips	Alkalinity and hardness measurements of AEM.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
13-055 (e)	Aquatic Chemistry	I can monitor the AEM.	Monitor AEM	Journal, monitor and adjust physical chemical properties.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to

							special cases or exceptions defined in the text.
14-056 (a)	Technical Reading and Writing	I can describe the advantages of active technical reading.	Literature Review	Step 03 completion using ANT and APA style.	Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
14-057 (b)	Aquatic Chemistry	I can compare the salinity of filtered, HRE, and AEM water.	Comparison of salinity between different solutions	Monitor, record, and graph the salinities of various solutions.	Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
14-058 (c)	Instrumentation	I can relate the concepts of accuracy and precision to measurement.	Measure temperature of boiling and freezing water and relate concepts of accuracy and precision	Calibrate pH/EC Hanna Combo Meters.	Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
14-059 (d)	Instrumentation	I can explain the concept of calibration with standards for repeatability in measurement.	Use standards to calibrate pH sensor	Working definitions of accuracy, precision, calibration, and repeatability.	Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9–10 texts and topics*.
14-060 (e)	Aquatic Chemistry	I can monitor and add a primary producer to the AEM.	Monitor AEM	Journal, monitor and adjust physical chemical properties; add algae.	Standard 3a: Universal Foundation Skills		R7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
15-061 (a)	Technical Reading and Writing	I can summarize sources of my literature review. Step 03	Summarizing using Active Note Taking	Step 03 completion using ANT and APA style.	Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
15-062 (b)	Aquatic Ecology	I can describe the role of primary producers in an ecosystem	Ecosystem Theory	Journal entry explaining the role of algae in AEMs.	Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles,	W2a. Introduce a topic and organize ideas, concepts, and information to make

						and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
15-063 (c)	Instrumentation	I can create standards for pH.	Prepare pH standards	pH standard preparation.	Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
15-064 (d)	Instrumentation	I can calibrate a pH meter and test for instrument error.	Calibrate pH sensors	pH sensor calibration and instrument error testing graph.	Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
15-065 (e)	Aquatic Chemistry	I can monitor and add primary consumers to the AEM.	Monitor AEM	Journal, monitor and adjust physical chemical properties; add invertebrates (snails + shrimp).	Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
16-066 (a)	Data Management	I can graph my data using excel.	Graph data on MS Excel	Excel graphs of AEM physical/chemical parameters.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.	
16-067 (b)	Data Management	I can graph my data using excel.	Continue graphing and add graphs to a slide show	Excel graphs of AEM physical/chemical parameters.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and	

						trigonometry.	
16-068 (c)	Data Analysis	I can connect my data to the health of the AEM.	Data Analysis	Figures of the AEM data.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
16-069 (d)	Data Analysis	I can connect my data to the health of the AEM.	Data Analysis	Digital presentation of aspect of AEM.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
16-070 (e)	Aquatic Chemistry	I can monitor and describe maintenance procedures for the AEM.	Monitor AEM	Journal, monitor and adjust physical chemical properties.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		R7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
17-071 (a)	Presentation Skills	I can present the state of the health of my AEM and I can explain the role of primary consumers in an ecosystem.	Digital Presentations MLP 02: Analyze the relationship between ammonia, nitrite, and nitrate levels of an AEM	Digital presentation of an aspect of the AEM.	Standard 2: Integrated Learning Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
17-072 (b)	Presentation Skills	I can present the state of the health of my AEM and I can explain the role of primary consumers in an ecosystem.	Digital Presentations MLP 02: Analyze the relationship between ammonia, nitrite, and nitrate levels of an AEM	Digital presentation of an aspect of the AEM.	Standard 2: Integrated Learning Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
17-073 (c)	Project Management	I can present my top 3 media sources that relate to my topic of interest.	Step 02 – Literature review defense	Literature review and topic definition.	Standard 2: Integrated Learning Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
17-074 (d)	Aquatic Chemistry	I can monitor the AEM and prepare a schedule for maintenance during Regents week (MLP 04 – Prepare a diagnosis presentation of your AEM – due 1st week of semester 2)	Monitor AEM	Journal, monitor and adjust physical chemical properties (MLP 04)	Standard 2: Integrated Learning Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
18	Aquatic Chemistry (Regents Week)	I can monitor the AEM.	Lab Techniques	Journal, monitor and adjust physical chemical properties.	Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an

							equation) into words.

Grade 10 – Spring Term – INTRODUCTORY MARINE RESEARCH II

Wk-Dy (lesson)	Topics	Learning Targets	Activities	Student Work Products	NYS CDOS Learning Standards	NYS Standards	Common Core Standards
01-075 (a)	Presentation Skills	Present a diagnosis of your AEM	Peer presentations	Slide show of diagnosis of AEM	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		
01-076 (b)	Aquatic Chemistry	I can identify the role of DO and BOD in an ecosystem.	Mime the procedures of measuring DO using the Winkler Method of the AEM	Journal entry explaining role of DO and BOD in an ecosystem.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	
01-077 (c)	Aquatic Chemistry	I can practice the procedures for measuring DO.	Mime the procedures of measuring DO using the Winkler Method of the AEM	DO procedure practice.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
01-078 (d)	Aquatic Chemistry	I can monitor the AEM.	Monitor DO in AEM	AEM monitored	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
02-079 (a)	Aquatic Chemistry	I can monitor the DO in my AEM.	Monitor DO in AEM	DO monitored in AEM	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
02-080 (b)	Aquatic Chemistry	I can monitor the DO in my AEM.	Monitor DO in AEM	DO monitored in AEM	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking

						systems to satisfy human and environmental needs.	measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
02-081 (c)	Technical Reading and Writing	I can identify what a peer reviewed journal article (PRJA) is.	Tech. Read + Write Theory using Michael Judge's article on Perwinkles	Journal entry explaining what a peer reviewed journal article is.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	W8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
02-082 (d)	Technical Reading and Writing	I can effectively search for a journal article. Part I	Search for journal articles using internet search engines	One PRJA found using a search engine.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	W8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
02-083 (e)	Aquatic Chemistry	I can monitor and add secondary consumers to the AEM.	Add ecosystem components to AEM and monitor	Journal, monitor and adjust physical chemical properties; vertebrates and assassin snails added.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-084 (a)	Technical Reading and Writing	I can effectively search for a journal article. Part II (due week 7)	Search for journal articles using internet search engines	One journal article found using a search engine.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	W8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and

							following a standard format for citation.
03-085 (b)	Technical Reading and Writing	I can write the bibliography of a peer reviewed journal article.	Bibliography Preparation Using APA Style	Bibliography APA style of 3 PRJAs.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
03-086 (c)	Technical Reading and Writing	I can write the bibliography of a peer reviewed journal article.	Bibliography Preparation Using APA Style	Bibliography APA style of 3 PRJAs.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
03-087 (d)	Aquatic Chemistry	I can identify the nutritional needs of terrestrial plants in an AEM.	Plant nutrition theory	Journal entry identifying the nutritional needs of plants.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
03-088 (e)	Aquatic Chemistry	I can monitor the AEM and add magnesium sulfate for photosynthetic pigments. (Assign MLP 03. NYCSEF).	Monitor AEM and add magnesium sulfate	Journal, monitor and adjust physical chemical properties of AEM.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		R7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
04-089 (a)	Technical Reading and Writing	I can identify Active Note Taking (ANT) Skills.	Active Note Taking Skills Theory	Journal entry Identifying different active note taking skills.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		
04-090 (b)	Technical Reading and Writing	I can read the abstract and introduction of a PRJA.	Read the introduction to a PRJA (peer reviewed journal article)	ANT of abstract and introduction.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
04-091 (c)	Technical Reading and Writing	I can identify the project purpose of a PRJA.	Identify scientific problem of a PRJA	ANT of project purpose.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
04-092 (d)	Technical Reading and Writing	I can interpret journal article figures and captions. Part I	Analyze the results of a PRJA	Mark up of journal article figures.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

04-093 (e)	Aquatic Chemistry (NYCSEF weekend)	I can monitor the AEM.	Monitor AEM	Journal, monitor and adjust physical chemical properties of AEM.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-094 (a)	Presentation Skills	I can identify key strategic presentation skills demonstrated in NYCSEF.	Discuss NYCSEF projects and presentation skills	Class discussion of NYCSEF project and presentation strategies.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		
05-095 (b)	Technical Reading and Writing	I can interpret journal article figures and captions. Part II	PRJA figures and captions are to be marked up and translated to simpler language	Mark up of journal article captions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
05-096 (c)	Technical Reading and Writing	I can relate the results and conclusions of a PRJA.	Venn diagram to be completed relating the results and conclusions of a PRJA	Journal entry explaining the different settings of the scope.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		
05-097 (d)	Presentation Skills	I can prepare a slide show for the AEM. (MLP 04: Create a presentation of the state of the AEM)	AEM 2nd slide show presentation theory; (MLP 04: Create a presentation of the state of the AEM)	Journal entry on slide show presentation expectations. (MLP 04: Create a presentation of the state of the AEM)	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
05-098 (e)	Aquatic Chemistry	I can monitor the AEM.	Monitor AEM	Journal, monitor and adjust physical chemical properties.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
06-099 (a)	Technical Reading and Writing	I can summarize my project PRJA.	Summarize Project PRJA	Summary using ANT of PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
06-100 (b)	Microscopy	I can maintain a microscope.	Microscope maintenance and inspection	Cleaned microscopes + parts worksheet filled.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
06-101 (c)	Microscopy	I can describe the history of the microscope and identify its parts.	ID Microscope parts	Journal entry of history and parts of microscope.	Standard 2: Integrated Learning	Standard 4: Students will understand and apply	W2. Write informative/explanatory texts,

					Standard 3a: Universal Foundation Skills	scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	including the narration of historical events, scientific procedures/ experiments, or technical processes.
06-102 (d)	Microscopy	I can correctly use the different settings of a microscope.	Letter “e” lab	Drawings of letters in field of vision.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
06-103 (e)	Microscopy	I can view microorganisms in the AEM.	View microorganisms of AEM	Journal, monitor and adjust physical chemical properties.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
07-104 (a)	Technical Reading and Writing	I can summarize my project PRJA. (MLP 05 - I can find 4 up-to-date articles on my topic of interest and summarize them in my research journal – due week 16)	Summarize Project PRJA	Summary using ANT of PRJA. (MLP 05)	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
07-105 (b)	Microscopy	I can prepare dry and wet microscope samples.	Prepare wet and dry slides	Wet and dry slides prepared.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
07-106 (c)	Microscopy	I can record results of microorganisms of the AEM using a microscope.	Microscope observations of AEM algae and recorded on microscopy paper	Microorganisms recorded on microscopy data sheets.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
07-107 (d)	Microscopy	I can record results of microorganisms of the AEM using a microscope.	Microscope observations of AEM algae and recorded on microscopy paper	Microorganisms recorded on microscopy data sheets.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

07-108 (e)	Microscopy	I can view microorganisms in the AEM. (MLP 04 due: Create a presentation of the state of the AEM).	View microorganisms of AEM	Drawing of organisms in field of vision + ID if possible.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
08-109 (a)	Presentation Skills	I can review my AEM (MLP 04) slide show for deficiencies and practice my presentation.	Review and practice AEM presentation (MLP 04) using small group rotations	AEM 2nd presentation review and practice.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
08-110 (b)	Presentation Skills	I can review my AEM (MLP 04) slide show for deficiencies and practice my presentation.	Review and practice AEM presentation (MLP 04) using small group rotations	AEM 2nd presentation review and practice.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
08-111 (c)	Presentation Skills	I can review my AEM (MLP 04) slide show for deficiencies and practice my presentation.	Review and practice AEM presentation (MLP 04) using small group rotations	AEM 2nd presentation review and practice.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
08-112 (d)	Technical Reading and Writing	I can prepare a lab report for the AEM.	AEM lab report writing.	AEM lab report draft.	Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
08-113 (e)	Technical Reading and Writing	I can prepare a lab report for the AEM.	AEM lab report writing.	AEM lab report draft.	Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
09-114 (a)	Technical Reading and Writing	I can prepare a lab report for the AEM.	AEM lab report writing.	AEM lab report draft.	Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
09-115 (b)	Technical Reading and Writing	I can prepare a lab report for the AEM.	AEM lab report writing.	AEM lab report draft.	Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
09-116 (c)	Technical Reading and Writing	I can prepare a lab report for the AEM.	AEM lab report writing.	AEM lab report draft.	Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of

							historical events, scientific procedures/ experiments, or technical processes.
09-117 (d)	Technical Reading and Writing (Good Friday – no School or day 5)	I can identify the required components of a PRJA slide show presentation. ---------- (After school in preparation of Spring Break) I can transfer an AEM to a larger holding tank and harvest basil.	Review PRJA slide show requirements; Place organisms into larger holding tanks and disinfect smaller tanks; Harvest basil.	Journal entry for PRJA slide show requirements. ------- Placement of all AEM organisms and substrates into larger holding tank in preparation for Spring Break.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		
10-118 (a)	Presentation Skills (week after Spring Break)	I can present my AEM results to an audience.	Present AEMs – audience uses ANT and judges using scoring sheet	AEM Digital Presentation, students use ANT to take notes, and student score sheets.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		
10-119 (b)	Presentation Skills (week after Spring Break)	I can present my AEM results to an audience.	Present AEMs – audience uses ANT and judges using scoring sheet	AEM Digital Presentation, students use ANT to take notes, and student score sheets.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		
10-120 (c)	Systematics	I can use a dichotomous key to identify filamentous green algae.	Use a dichotomous key to identify the filamentous green algae	Identification of filamentous green algae.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
10-121 (d)	Systematics	I can use a dichotomous key to identify filamentous green algae.	Use a dichotomous key to identify the filamentous green algae	Identification of filamentous green algae.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
10-122 (e)	Zoology	I can explain aspects of the biology and ecology of a squid.	Students who hand in a first draft of PRJA slide show summary dissect squid	Dissection of a squid.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
11-123 (a)	Presentation Skills	I can present and use constructive criticism to update a digital presentation of a PRJA.	Round robin presentations and group critique	Digital presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance

							on any one source and following a standard format for citation. W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
11-124 (b)	Presentation Skills	I can present and use constructive criticism to update a digital presentation of a PRJA.	Round robin presentations and group critique	Digital presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
11-125 (c)	Presentation Skills	I can present and use constructive criticism to update a digital presentation of a PRJA.	Round robin presentations and group critique	Digital presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
11-126 (d)	Technical Reading + Writing	I can relate the methods of a PRJA to the results and conclusions.	Flow diagram	Completed flow diagram comparing relationship between methods, results, and conclusions.	Standard 2: Integrated Learning Standard 3a: Universal		W2. Write informative/explanatory texts, including the narration of

					Foundation Skills		historical events, scientific procedures/ experiments, or technical processes.
11-127 (e)	Technical Reading + Writing	I can describe how the analysis is related to the literature review of a PRJA. - (MLP 05: Create a simple marine food web of the AEM) - (Lab tech - organize and maintain an inventory of AEM sampling equipment.)	Review the relationship between the literature review and the analysis of a journal article (MLP 05: Create a simple marine food web of the AEM)	Venn Diagram comparing Analysis and literature review of a PRJA. (MLP 05: Create a simple marine food web of the AEM).	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
12-128 (a)	Presentation Skills	I can present and use constructive criticism to update a digital presentation of a PRJA.	Round robin presentations and group critique	Digital presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
12-129 (b)	Presentation Skills	I can present and use constructive criticism to update a digital presentation of a PRJA.	Round robin presentations and group critique	Digital presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
12-130 (c)	Presentation Skills	I can present and use constructive criticism to update a digital presentation of a PRJA.	Round robin presentations and group critique	Digital presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
12-131 (d)	Presentation Skills	I can present and use constructive criticism to update a digital presentation of a PRJA.	Round robin presentations and group critique	Digital presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
12-132 (e)	Presentation Skills	I can present and use constructive criticism to update a digital presentation of a PRJA.	Round robin presentations and group critique	Digital presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
13-133 (a)	Presentation Skills	I can prepare a poster board presentation of a PRJA.	Poster board preparation	Poster board presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
13-134 (b)	Presentation Skills	I can prepare a poster board presentation of a PRJA.	Poster board preparation	Poster board presentation of a PRJA.	Standard 2: Integrated Learning		W2. Write informative/explanatory texts,

					Standard 3a: Universal Foundation Skills		including the narration of historical events, scientific procedures/ experiments, or technical processes.
13-135 (c)	Presentation Skills	I can prepare a poster board presentation of a PRJA.	Poster board preparation	Poster board presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
13-136 (d)	Presentation Skills	I can prepare a poster board presentation of a PRJA.	Poster board preparation	Poster board presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
13-137 (e)	Presentation Skills	I can prepare a poster board presentation of a PRJA.	Poster board preparation and presentation (present in hallway)	Poster board presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
14-138 (a)	Presentation Skills	I can present a poster board presentation of a PRJA. (film presentations)	Poster board preparation and presentation (present in hallway)	Poster board presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
14-139 (b)	Presentation Skills	I can present a poster board presentation of a PRJA. (film presentations)	Poster board preparation and presentation (present in hallway)	Poster board presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
14-140 (c)	Presentation Skills	I can present a poster board presentation of a PRJA. (film presentations)	Poster board preparation and presentation (present in hallway)	Poster board presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
14-141 (d)	Presentation Skills	I can present a poster board presentation of a PRJA. (film presentations)	Poster board preparation and presentation (present in hallway)	Poster board presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
14-142 (e)	Presentation Skills	I can present a poster board presentation of a PRJA.	Poster board preparation and presentation (present in hallway)	Poster board presentation of a PRJA.	Standard 2: Integrated Learning		W6. Use technology, including the Internet, to produce,

		(film presentations)			Standard 3a: Universal Foundation Skills		publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
15-143 (a)	Presentation Skills	I can present a poster board presentation of a PRJA. (film presentations)	Poster board preparation and presentation (present in hallway)	Poster board presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
15-144 (b)	Presentation Skills	I can present a poster board presentation of a PRJA. (film presentations)	Poster board preparation and presentation (present in hallway)	Poster board presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
15-145 (c)	NYHS Science and Engineering Fair	I can present a poster board presentation of a PRJA at a high school science and engineering fair. (film presentations)	Poster board presentation in hallway	Poster board presentation of a PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
15-146 (d)	NYHS Science and Engineering Fair	I can debrief from a high school science and engineering fair. (film reactions)	Review score sheets	Score sheet reviews, journaling, and video documentation.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
16-147 (a1)	Project Management	I can review the experimental design matrix.	Review Experimental Design Matrix with examples of a plant experiment	Experimental design matrix reviewed and filled out for plant experiments.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
16-147 (a2)	Project Management	I can apply an experimental design matrix to a PRJA.	Apply the Experimental Design Matrix to the PRJA – Achievement of 100% Removal of Oil from Feathers…	Experimental design matrix filled out for PRJA.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
16-147 (a3)	Project Management	I can review 4 up-to-date articles on my topic of interest.	Internet search query for journal articles	Literature review.	Standard 2: Integrated Learning		R7. Integrate and evaluate multiple sources of

					Standard 3a: Universal Foundation Skills		information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
16-148 (b)	Project Management	I can review the summaries of 4 up-to-date articles on my topic of interest.	Review summaries for journal articles in journal notebooks	Literature review.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
16-149 (c)	Project Management	I can describe the project formulation hierarchy.	Project formulation theory - Step 04	Fill out Step 04.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
16-150 (d)	Project Management	I can describe the project formulation hierarchy.	Project formulation theory - Step 04	. Fill out Step 04.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
17-151 (a)	Project Management	I can list potential project advisors and mentors for my project of interest – STEP 03a.	Create a list of topic experts – Step 05	Fill out Step 05	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
17-152 (b)	Project Management	I can create a proper e-mail to contact project advisors.	E-mail creation for advisors	Contact with advisors to answer project questions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
17-153 (c)	Project Management	I can contact advisors regarding my topic of interest.	Contact advisors	Contact with advisors to answer project questions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize

							multiple sources on the subject, demonstrating understanding of the subject under investigation.
17-154 (d)	Project Management	I can contact advisors regarding my topic of interest.	Contact advisors	Contact with advisors to answer project questions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
17-155 (e)	Project Management	I can contact advisors regarding my topic of interest.	Contact advisors	Contact with advisors to answer project questions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
18-156 (a)	Project Management	I can contact advisors regarding my topic of interest.	Contact advisors	Contact with advisors to answer project questions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
18-157 (b-d)	Lab/Field Procedures	I can inventory and organize my water quality supplies. (Set ISLs in Pier 101. Ropes to be left over the summer for succession studies and zoology during 11th grade)	Lab/Field procedures	Research lab prepared for summer research.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		

Grade 10 - 11 – Summer Marine Biology Research Program - Intermediate Research Methods*

Week	Topics	Learning Targets	Activities	Student Work Products	NYS CDOS Learning Standards	NYS Standards	Common Core Standards
1	Project Management	I can design a data storage system. I can collect and process project data.	Design, collect and process project data.	Designed, collected and processed project data.	Standard 1: Career Development Standard 3b: Career Majors		W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated

							question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
2	Project Management	I can collect and process project data.	Collect and process project data.	Collected and processed project data.	Standard 1: Career Development Standard 3b: Career Majors		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
3	Project Management	I can collect and process project data.	Collect and process project data.	Collected and processed project data.	Standard 1: Career Development Standard 3b: Career Majors		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
4	Project Management	I can collect and process project data.	Collect and process project data.	Collected and processed project data.	Standard 1: Career Development Standard 3b: Career Majors		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
5	Project Management	I can collect and process project data.	Collect and process project data.	Collected and processed project data.	Standard 1: Career Development Standard 3b: Career Majors		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
6	Project Management	Present project data.	Present project data.	Present project data.	Present project data.		

**10th graders will get theory in the morning and then work with 11th and 12th graders on research projects for the rest of the day.*

Grade 11 – Fall Term – Intermediate Marine Research I

Wk-Dy (lesson)	Topics	Learning Targets	Activities	Student Work Products	NYS CDOS Learning Standards	NYS Standards	Common Core Standards
01-01 (a)	Intro to Research	I can review the value and expectations of the MBRP	**Give out materials list MLP 01 due next week.**	Class materials; review class syllabus	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		
01-01	Presentation Skills	I can present my summer research/internship experience.	Project/internship presentations	Project/internship (slide show) presentations.	Standard 3a: Universal Foundation Skills	Standard 2: Students will access, generate, process, and	

(b)					Standard 3b: Career Majors	transfer information using appropriate technologies.	
01-01 (c-d)	Intro to Research	I can present my summer research/internship experience.	Project/internship presentations; **Step 3a due week 3**	Project/internship (slide show) presentations.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
02-02 (a-b)	Technical Reading + Writing	I can describe in 2 sentences each PRJA I summarized over the summer.	PRJA class presentations	PRJA presentations	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
02-02 (c)	Lab/Field Safety (OSHA)	I can describe lab and field safety procedures.	Safety chart and safety symbol comparison; safety training; create and review an MBRP emergency action plan	Emergency Action Plan; Safety chart	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
02-02 (d)	Lab/Field Safety (OSHA)	I can practice lab and field safety procedures.	Practice safety training, communication, and an emergency situation	Emergency scenario completion	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
02-03 (a)	UHS	I can describe the UHS program, materials needed, and determine my eligibility to apply for college credit. (MLP 06 - Literature review slide show and 1st research report draft due weeks 5 + 6) (Step 03a due next week)	UHS and course syllabus slide show presentation; **Give out UHS course syllabus; Have students prepare a data sheet for next week** (MLP 06 - Literature review slide show and 1st research report draft due weeks 5 + 6) (Step 03a due next week)	Journal entry (MLP 06 - Literature review slide show and 1st research report draft due weeks 5 + 6) (Step 03a due next week)	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		
02-03 (b)	Project Management	I can describe the project management STEPS. (MLP 06 - Literature review slide show due weeks 5 + 6) (Step 03a due next week)	Project management chronogram and STEPS slide show (MLP 06 - Literature review slide show due weeks 5 + 6) (Step 03a due next week)	Journal entry (MLP 06 - Literature review slide show due weeks 5 + 6) (Step 03a due next week)	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
02-03 (c)	Project Management	I can properly keep a calendar, theory notebook, research journal, + portfolio. (MLP 06 - Literature review slide show due weeks 5 + 6) (Step 03a due next week)	Calendar, theory notebook, research journal, and portfolio slide show (MLP 06 - Literature review slide show due weeks 5 + 6) (Step 03a due next week)	Journal entry (MLP 06 - Literature review slide show due weeks 5 + 6) (Step 03a due next week)	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

02-03 (d)	Water Quality	I can sample water from the HRE and take basic water quality measurements.	-Sample HRE water and measure temperature and salinity from west side	Temperature and salinity measurements of HRE-GI, west side	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-04 (a)	Project Management	I can define a list of potential mentors for my project – STEP 05.	Fill out Advisor/Mentor lists – STEP 5; Advanced students fill out flow charts and materials lists	Advisor/Mentor lists – STEP 05	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
03-04 (b)	Project Management	I can define a project design chart – STEP 06.	Begin developing a project design chart	Project design chart – STEP 06	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
03-04 (c)	Project Management	I can describe the importance and requirements of the Project Conferences (review Project Conference form). **Project Conferences**	Fill out Project Conference form **Project Conferences**	Project Conference form filled out **Project Conferences**	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
03-04 (d)	Water Quality	I can sample basic water quality measurements and survey benthic organisms.	Sample HRE water for temperature and salinity and check on Invertebrate Sampling Lines (ISL) from Pier 101	Temperature and salinity measurements of HRE-GI	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-05 (a)	Project Management	I can describe the importance of using a chronogram for a project.	Creating a chronogram	Project chronogram as table or Gantt chart	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry

							when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
03-05 (b)	Project Management	I can create a research plan and chronogram for my project – STEP 00	Creating a research plan + chronogram – STEP 00	Project chronogram as table or Gantt chart – STEP 00	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
03-05 (c-d)	Project Management	I can manage my project during independent study. **Project Conferences**	Independent study **Project Conferences**	Start Project Research Plan draft **Project Conferences**	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
04-06 (a-b)	Project Management	01. I can define procedures and materials needed for my project – STEPS 07-08.	Prepare flow chart + materials - STEPS 07-08	Flow charts and materials lists started - STEPS 07-08	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
04-06 (c-d)	GIS	I can create a rangeland assessment for Governor's Island and my project locality – STEP 03f.	Locate GI, define coordinates, calculate area, measure perimeter of NYHS, and export a map of GI using GE; Prepare a map of the research location using Google Earth	GI + study area map	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		
04-07 (a)	Career and Financial Management	I can create a budget for project materials.	Prepare project materials budget	Project materials budget **Project Research Plan draft**	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
04-07 (b)	Project Management	I can create a data table.	Prepare a data table	Data table filled	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	W2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
04-07 (c-d)	Water Quality	I can compare samples of basic physical-chemical parameters for quality control.	Sample HRE water and measure temperature, salinity, and full gamma of nutrients of Pier 101 by two different groups to compare data and control for quality	Physical-chemical measurements of HRE-GI at Pier 101	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-08 (a-b)	Technical Reading and Writing	I can write the justification and the introduction of my project.	Write the justification and introduction	Project justification and introduction completed **Project Research Plan draft**	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address	W2. Write informative/explanatory texts, including the narration of historical events, scientific

						real-life problems and make informed decisions.	procedures/ experiments, or technical processes.
05-08 (c)	Marine Botany	I can describe the main types of marine algae and explain their ecological role.	Marine Algae theory	Journal entry	Standard 2: Integrated Learning	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
05-08 (d)	Marine Botany	I can identify marine algae growing around GI.	Observe macroscopic algae growing on ISL and benthic rocks around GI beach	Marine algae identification	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
05-09 (a)	Presentation Skills	I can present a draft of my project literature review.	**Literature slide show**	**Literature slide show**	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
05-09 (b)	Plankton + GIS	I can explain how plankton is the basis of marine food webs around the world.	Fill in map of major upwelling centers around the world and worksheet with different plankton	Upwelling map and major forms of plankton	Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
05-09 (c)	Water Quality + Plankton	I can sample for water physical-chemical parameters and plankton.	Sample physical-chemical parameters, enterococcus, and phytoplankton at Pier 101	Samples of different types of plankton	Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-09 (d)	Plankton	I can identify plankton samples.	Observe plankton samples under the microscope and incubate enterococcus samples (take pictures of quantitrays)	Field of view drawings and tally of plankton	Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	
Alt.	Systematics	I can explain why organisms are identified?	Create an ID key for cyanobacteria	Journal entry explaining difference between classification and identification.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

						ideas in science.	
Alt.	Systematics	I can create a dichotomous key to identify aquatic organisms.	Create an ID key for cyanobacteria	ID key for cyanobacteria.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
Alt.	Systematics	I can create a dichotomous key to identify aquatic organisms.	Finish up identification keys	ID key for cyanobacteria.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
Alt.	Systematics	I can create a dichotomous key to identify aquatic organisms.	Finish up identification keys	ID key for cyanobacteria.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
Alt.	Systematics	I can use a dichotomous key to identify filamentous green algae in an AEM	Use a dichotomous key for species identification	Identification of 6 marine organisms.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
06-10 (a)	Water Quality	I can describe the role of biological indicators (Enterococcus) of water quality.	Water quality theory and analysis of quantitrays for MPN (CSOs, swimming, rain, etc.)	Journal entry	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
06-10 (b)	Zooplankton	I can distinguish the main zooplanktonic components.	Observe micrographs of zooplanktonic larvae and dinoflagellate anatomy worksheet	Dinoflagellate anatomy worksheet	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
06-10	Presentation Skills	I can present a draft of my project literature review.	**Literature slide show** (MLP 07 – 2nd research report	**Literature slide show** (MLP 07 – 2nd research report draft	Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking	W7. Conduct short as well as more sustained research

(c-d)			draft due week 9)	due week 9)	Standard 3b: Career Majors	skills of mathematics, science, and technology to address real-life problems and make informed decisions.	projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
06-11 (a)	GIS	I can read a bathometric chart.	Create a color-coded bathymetric chart for GI	**1st draft of written report due** (Title page, table of contents, introduction, and background information)**;** Color-coded bathymetric chart of GI	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	
06-11 (b-c)	GIS	I can create a bathometric chart off of Pier 101.	Create a color-coded bathymetric chart off of Pier 101	Color-coded bathymetric chart off of Pier 101	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		
06-11 (d)	Water Quality	I can sample for water physical-chemical and biological parameters.	Sample physical-chemical parameters enterococcus at east vs. west sides of GI	Samples of water quality parameters	Standard 3a: Universal Foundation Skills		
07-12 (a-b)	Project Management	I can manage my project during independent study. **Project Conferences**	Independent study (students evaluate 1st drafts) **Project Conferences**	Project formulation (student evaluations of 1st drafts) **Project Research Plan draft** **Project Conferences**	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
07-12 (c-d)	GIS	I can compare the relationship between contour lines and landscape features.	Add topographic overlays over maps of Fort Tryon Park and Tayrona National Park (Colombia) to compare with actual landscape	Maps of Fort Tryon Park and Tayrona National Park with topographic information, point feature with lat./lon., and elevation data	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	
07-13 (a-d)	GIS **(Day Trip)**	I can ground proof geographical features of a map with GPS and create way points.	Visit/hike Fort Tryon park and ground proof map features	Ground proofed maps produced in class	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		
08-14 (a)	Invertebrate Zoology	I can describe the anatomy, physiology, and ecological significance of the phylum Porifera.	Poriferan theory	Completed species fiche of poriferans	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by

						environment and recognize the historical development of ideas in science.	paraphrasing them in simpler but still accurate terms.
08-14 (b)	Invertebrate Zoology	I can describe the anatomy, physiology, and ecology of organisms in the phylum Cnidaria + Ctenophora.	Cnidarian and ctenophoran ecological theory	Journal entry contrasting the ecological roles of cnidarians, ctenophores, and poriferans	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
08-14 (c-d)	Invertebrate Zoology	I can monitor larval recruitment on an Invertebrate Sampling Line.	Monitor ISLs	ISLs monitored	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
08-15 (a)	Project Management	I can write the materials and procedures chapters of my research project.	Write a materials list and procedures for research projects	Materials lists + procedures for project; 2nd	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
08-15 (b)	Project Management	I can manage my project during independent study. **Project Conferences**	Independent study **Project Conferences**	Project formulation **Project Conferences**	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
08-15 (c-d)	Water Quality	I can sample for water physical-chemical and biological parameters.	Sample physical-chemical parameters enterococcus at east vs. west sides of GI (Set crab trap at Pier 101 or buy crabs from fish market.)	Samples of water quality parameters	Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
09-16 (a)	Invertebrate Zoology	I can identify a mollusk using an online dichotomous key.	Use an online dichotomous key to identify *P. corneus*	Journal entry describing use of key to identify species	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or

						the historical development of ideas in science.	exceptions defined in the text.
09-16 (b)	Invertebrate Zoology	I can describe the anatomy and physiology, and behavior of the phylum Molluska.	Study the anatomy, physiology, and behavior of *Planorbarius corneus* (MBB) (MLP 08 – 3rd research report and 1st poster board draft due week 12)	Completed species fiche of mollusks (MLP 08 – 3rd research report and 1st poster board draft due week 12)	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
09-16 (c)	Invertebrate Zoology	I can use a cladogram to describe the evolutionary relationship between the phylum Arthropoda and Molluska.	Read cladograms of mollusks and arthropods	Journal entry describing the evolutionary relationship between arthropods and mollusks	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
09-16 (d)	Invertebrate Zoology	I can study the behavior of hermit crabs (phylum Arthropoda).	Study the behavior of exposed hermit crabs (MBB)	Behavioral chart of hermit crabs	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
09-17 (a-b)	Project Management	I can organize and picture data (tables, graphs, captions, labels, and titles).	Create possible scenarios of data tables to use for student projects along with hypothetical graphs.	Project data tables and stats	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
09-17 (c-d)	Water Quality	I can sample for water physical-chemical and biological parameters.	Sample physical-chemical parameters enterococcus at east vs. west sides of GI	Samples of water quality parameters	Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
10-18 (a-b)	Invertebrate Zoology	I can describe the anatomy, physiology, and ecology of the phylum Echinodermata.	Present a digital presentation; Read cladograms of echinoderms;	**Project Research Plan draft** (edits included, locality map, project design chart, vocabulary section)**;** Completed species fiche of Echinodermata	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

10-18 (c-d)	Invertebrate Zoology	I can describe the evolutionary relationships between the phylum Echinodermata and other invertebrates.	Read cladograms of echinoderms and other invertebrates	Diagrams of specimens of Echinodermata.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
11-19 (a-b)	Invertebrate Zoology	I can describe the anatomy, physiology, and ecology of the phylum Urochordata.	Present a digital presentation; Read cladograms of echinoderms;	Diagrams of specimens of Urochordata.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
11-19 (c-d)	Quantitative Ecology	I can sample ISLs for benthic organisms.	Sample ISLs from Pier 101 (Set fish traps)	ISL sample data	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
12-20 (a-d)	Project Management	I can manage my project during independent study. (Students with data organize results and work on analysis chapter) **Project Conferences**	Independent study (Results and analysis preparation) **Project Conferences**	Project formulation (Data results - written paragraphs and graphs) **Project Research Plan draft** **Project Conferences**	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
12-21 (a)	Ichthyology	I can describe the anatomy, physiology, and ecology of the class Agnatha.	Read cladograms of Agnatha	Species fiche for the typical agnathan	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
12-21 (b)	Ichthyology	I can describe the anatomy of the class chondricthyes.	Read cladogram of chondrichthyes	Species fiche for the typical chondrichthian.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
12-21 (c)	Ichthyology	I can describe the anatomy, physiology, and ecology of bony fishes (nekton).	Theory of bony fishes [MLP 09 – 4th (final) research report and 2nd poster board draft	[MLP 09 – 4th (final) research report and 2nd poster board draft due week 15]	Standard 2: Integrated Learning Standard 3a: Universal	Standard 4: Students will understand and apply scientific concepts, principles,	R2. Determine the central ideas or conclusions of a text; summarize complex concepts,

			due week 15]		Foundation Skills Standard 3b: Career Majors	and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
12-21 (d)	Ichthyology	I can describe the phylogeny of bony fishes.	Phylogeny of bony fishes	**3rd draft of written report due** (results, analysis, conclusions, bibliography, suggestions for improvement, suggestions for future research, abstract, figures)**;** **1st Poster board draft due** Journal entry for bony fishes	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
13-22 (a-b)	Statistics	I can describe the terms probability and statistics (Add Magnussen, 1996, 1997).	[Describe different scenarios that require probability and statistics]	[Journal entry describing the relationship between probability and statistics]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
13-22 (c-d)	Statistics	I can define the statistical outcomes of my project.	define the statistical outcomes and statistical tests you will use to create and support your data	Lab journal and portfolio formatted; Project design chart filled	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
13-23 (a)	Statistics	I can compare the use of measures of central tendency with the normal distribution and dispersion graphs to describe data.	Measure students leg lengths and apply measures of central tendency; Compare heights of girls vs. boys in class with average bar graphs and dispersion graphs on excel	Measures of central tendency calculated to class leg lengths; Bar and dispersion graphs of class boy vs. girl heights	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
13-23 (b-c)	Statistics	I can analyze data using Measures of Central Tendency, whiskers and quartiles, box plots using excel.	Use Microsoft Excel to calculate MCT, whiskers and quartiles, and box plots of data sets; Mentor search	MCT, whiskers and quartiles, and box plots creation of data sets.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 3: Students will understand mathematics and become mathematically confident by communicating	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated

						and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.	question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
13-23 (d)	Water Quality	I can sample for water physical-chemical and biological parameters.	Sample physical-chemical parameters enterococcus at east vs. west sides of GI	Samples of water quality parameters	Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
14-24 (a)	Statistics	I can define and estimate the probability of a sampling space.	Define the probability of the project sample space	Application of statistical theory to projects	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
14-24 (b)	Statistics	I can analyze data using linear regression.	Apply lineal regression to student leg length vs. height and dissolved oxygen and temperature	linear regression of example data	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
14-24 (c-d)	Project Management	I can manage my project during independent study. **Project Conferences**	Independent study (Students work on research paper drafts) **Project Conferences**	**FINAL Project Research Plan draft;** Project formulation (Students work on research paper drafts) **Project Conferences**	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
14-25 (a)	Statistics	I can describe the relationship between a probability distribution, standard deviation, uncertainty, and variance.	calculate bell curve based on student heights; calculate variance of student heights	Creation of bell curve based on student leg length data; calculation of variance with student height data	Standard 2: Integrated Learning Standard 3a: Universal	Standard 3: Students will understand mathematics and become mathematically	W7. Conduct short as well as more sustained research projects to answer a question

					Foundation Skills	confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.	(including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
14-25 (b)	Statistics	I can analyze data using a t-test and a chi square test and define the statistical test I will use for my project.	Apply t-test to CO2 data in NYHS classroom with + w/out students	linear regression of example data	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.	W7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
14-25 (c)	Technical Reading and Writing	I can write the analysis of results of my research paper.	Write a analysis of research paper	Project analysis	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
14-25 (d)	Technical Reading and Writing	I can write the conclusions and finish formatting my research project.	Prepare conclusions, annexes and suggestions	Finalizing annexes, suggestions for improvement, and suggestions for future research	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.

15-26 (a-d)	Presentation Skills	I can prepare a basic poster presentation	Prepare poster board; Practice presentations	Poster board presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
15-27 (a-c)	Presentation Skills	I can prepare a basic poster presentation	Prepare poster board; Practice presentations **4th (final) draft of written report due**	Poster board presentation; Final research paper due;	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
15-27 (d)	Water Quality	I can sample for water physical-chemical and biological parameters.	Sample physical-chemical parameters enterococcus at east vs. west sides of GI	Samples of water quality parameters	Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
16	Presentation Skills **(Christmas Break)**	I can prepare a basic poster presentation	Prepare poster board	Poster board presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
17-28 (a)	Project Management	I can prepare a basic poster presentation.	Prepare poster board; Mentor search	Project preparation; Poster draft due	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
17-28 (b-d)	Project Management	I can present a basic poster presentation. (Will count as midterm.)	Present poster board; Mentor search	Project presentations; Poster draft due	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		
17-29 (a-b)	Project Management	I can prepare a resume and personal statement.	Prepare resume and personal statement	Poster draft due; Resumes and personal statements completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		
17-29 (c-d)	Water Quality	I can sample for water physical-chemical and biological parameters.	Sample physical-chemical parameters enterococcus at east vs. west sides of GI	Samples of water quality parameters	Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
18	(Regents Week)	(Regents Week)	(Regents Week)	(Regents Week)	(Regents Week)		

Grade 11 – Spring Term – Intermediate Marine Research II

Wk-Dy (lesson)	Topics	Learning Targets	Activities	Student Work Products	NYS CDOS Learning Standards	NYS Standards	Common Core Standards

01-30 (a)	Project Management	I can properly keep a lab journal + portfolio	Format Research Journal	Formatted research journal and portfolio	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
01-30 (b)	Project Management	I can manage my project.	Update chronogram and revise sampling activities	Updated chronograms	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
01-30 (c-d)	Project Management	I can define an experimental and observational design – Step 06.	Project design definition and review of sampling methods	Project design chart	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
01-31 (a)	Career and Financial Management	I can identify basic features of economic systems and analyze major features of the U. S. economic system. Part I	- Questions to be answered by every economic system - Production and distribution decisions (circular flow) in a market-oriented Economy - Choices	[Journal entry describing the basic features of economic systems and major features of the U. S. economic system]	Standard 2: Integrated Learning Standard 3b: Career Majors		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
01-31 (b)	Career and Financial Management	I can identify basic features of economic systems and analyze major features of the U. S. economic system. Part II	- Factors affecting economic systems and employment - Sociological, economic, and technological issues - Effect of technology on the labor market and the economy	[Journal entry describing the basic features of economic systems and major features of the U. S. economic system]	Standard 2: Integrated Learning Standard 3b: Career Majors		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
02-32 (a)	Career and Financial Management	I can compare and contrast the operation of different business structures on business organization, business functions, and resource management. Part I	How business is organized – Discuss the advantages and disadvantages of each type of Organization	[Venn diagram of different business structures]	Standard 2: Integrated Learning Standard 3b: Career Majors		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
02-32 (b)	Career and Financial Management	I can compare and contrast the operation of different business structures on business organization, business functions, and resource management. Part II	How business functions – Discuss the functioning within the formal and informal codes of Organizations; How business apply financial and human resources – Compare and contrast the elements of time and materials to carry out business activities	[Venn diagram comparing and contrasting elements of time and materials in business activity]	Standard 2: Integrated Learning Standard 3b: Career Majors		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

02-33 (a)	Career and Financial Management	I can assess and analyze personal talents, values, and interests as they relate to a future career. Part I	Complete career interest and personality indicator assessments; Align personal characteristics and learning styles with the requirements of different career clusters	[Career and personality indicator assessment]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
02-33 (b-c)	Career and Financial Management	I can assess and analyze personal talents, values, and interests as they relate to a future career. Part II	Career plan – create and implement a plan including the required steps to transition from education/training to a career	[Career Plan]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
02-33 (d)	Water Quality	I can sample for water physical-chemical and biological parameters.	Sample physical-chemical parameters enterococcus at east vs. west sides of GI	Samples of water quality parameters	Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
03-34 (a-c)	Career and Financial Management	I can locate current information to direct the search for a career.	- Research employment opportunities - Gather information about skills assessed by state/national/private testing to certify competencies to enter the workforce Maintain an organized record of your job search information/resources	[Career skills and job search lists]	Standard 2: Integrated Learning Standard 3b: Career Majors		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
03-35 (a-c)	Career and Financial Management	I can prepare materials to demonstrate individual qualifications in the career search/acquisition process	- Complete a resume, cover letter, and job application	Cover letter, resume, and job application	Standard 2: Integrated Learning Standard 3b: Career Majors		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
03-35 (d)	Project Management	I can present a basic poster presentation. (Before NYCSEF.)	Present poster board	Project presentations	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
04-36 (a-b)	Career and Financial Management	I can develop skills in presentation and procedures to secure a position	- Job interview preparation - Follow-up – use appropriate forms of communication	[Job interview pointers]	Standard 2: Integrated Learning Standard 3b: Career Majors		
04-36 (c-d)	Career and Financial Management	I can develop skills in presentation and procedures to secure a position	- Participate in mock or actual interviews - Job selection – deciding on the job	[Mock interviews]	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		
05-37 (a-b)	Career and Financial Management	I can recognize the relationships between job search, selection, and the current state of the economy. Part I	- Relate current labor market information to employment opportunities, salaries, and work characteristics - Study traditional and nontraditional career options for men and women - Recognize the trend towards a more	[Journal entry on labor market trends]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information

			diverse population and workforce				presented in a text by paraphrasing them in simpler but still accurate terms.
05-38 (a-c)	Career and Financial Management	I can recognize the relationships between job search, selection, and the current state of the economy. Part II	- Analyze rising entrepreneurship opportunities - Study alternative types of employment	[Journal entry on alternative employment opportunities]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
05-38 (d)	Water Quality	I can sample for water physical-chemical and biological parameters.	Sample physical-chemical parameters enterococcus at east vs. west sides of GI	Samples of water quality parameters	Standard 3a: Universal Foundation Skills		
06-39 (a-b)	Career and Financial Management	I can assess and analyze personal talents, values, and interests as they relate to a future career. Part III	Career plan – create and implement a plan including the required steps to transition from education/training to a career	Life goals sketched	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
07-40 (a-c)	Career and Financial Management	I can assess and analyze personal talents, values, and interests as they relate to a future career. Part IV	Career plan – create and implement a plan including the required steps to transition from education/training to a career	Career plan created	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
08-041 (a-b)	Career and Financial Management	I can recognize skills needed for success in a chosen career and how it relates to work performance to achieve individual success in the workplace.	- Personal qualities - Interpersonal skills	[Journal entry on personal qualities and interpersonal skills]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
08-41 (c-d)	Career and Financial Management	I can appreciate how a good beginning is needed for success on the job.	- Complete required forms - Become familiar with working conditions	[Employment form filled]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
08-42 (a-b)	Career and Financial Management	I can describe shared responsibility between businesses and employees.	- Physical and mental health - Interdependent relationships	[Journal entry on interdependent relationships]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information

							presented in a text by paraphrasing them in simpler but still accurate terms.
08-42 (c-d)	Water Quality	I can sample for water physical-chemical and biological parameters.	Sample physical-chemical parameters enterococcus at east vs. west sides of GI	Samples of water quality parameters	Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
09-43 (a-b)	Career and Financial Management	I can determine the importance of time management to success on the job.	- Practice determining the elements of time to successfully carry out a planned activity - Compare and contrast the effects of efficient and inefficient time management on the completion of life tasks and workplace activities - Implement an effective schedule for organizing activities	[Organizational schedule for activities]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
09-43 (c-d)	Career and Financial Management	I can define Workplace laws and regulations.	- Review standard labor laws and regulations - Explore hiring and employment termination practices	[Journal entry for hiring and employment termination practices]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
10-44 (a-b)	Career and Financial Management	I can describe Role of labor unions and/or professional organizations.	- Overview of labor unions - Overview of professional organizations	[Journal entry regarding labor unions]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
10-44 (c-d)	Project, Career, and Financial Management	I can use project, career, and financial management skills to solve a water contamination mystery problem.	Apply career and management skills learned earlier to solve a water contamination mystery problem.	[Solution for water contamination exercise]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
10-45 (a-b)	Career and Financial Management	I can compare, contrast, and evaluate services provided by financial Institutions. Part I	- Checking Account - Savings Plan	[Journal entry regarding checking accounts]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
10-45 (c-d)	Water Quality	I can sample for water physical-chemical and biological parameters.	Sample physical-chemical parameters enterococcus at east vs. west sides of GI	Samples of water quality parameters	Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to

							special cases or exceptions defined in the text.
11-46 (a-b)	Career and Financial Management	I can compare, contrast, and evaluate services provided by financial Institutions. Part II	- Investigate and evaluate various forms of investments - Developing a personal budget	[Personal budget]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
11-46 (c-d)	Project, Career, and Financial Management	I can use project, career, and financial management skills to solve a water contamination mystery problem.	Apply career and management skills learned earlier to solve a water contamination mystery problem.	[Solution for water contamination exercise]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
11-47 (a-b)	Career and Financial Management	I can explain the role of government taxation and its effect on consumers and producers. Part I	- Provide examples of how individuals pay for public goods and services through taxes and fees - Analyze how taxes and tax policy affect individuals and institutions	[Journal entry regarding taxes and tax policy]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
11-47 (c-d)	Project, Career, and Financial Management	I can use project, career, and financial management skills to solve a water contamination mystery problem.	Apply career and management skills learned earlier to solve a water contamination mystery problem.	[Solution for water contamination exercise]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
12-48 (a-b)	Career and Financial Management	I can explain the role of government taxation and its effect on consumers and producers. Part II	Tax reporting	[Journal entry regarding taxes and tax policy]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
12-48 (c-d)	Project, Career, and Financial Management	I can use project, career, and financial management skills to solve a water contamination mystery problem.	Apply career and management skills learned earlier to solve a water contamination mystery problem.	[Solution for water contamination exercise]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
12-49 (a-b)	Career and Financial Management	I can understand the necessity of establishing and maintaining credit in today's society	- Sources and types of credit - Establishing credit	[Journal entry on types of credit]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

12-49 (c-d)	Water Quality	I can sample for water physical-chemical and biological parameters.	Sample physical-chemical parameters enterococcus at east vs. west sides of GI	Samples of water quality parameters	Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
13-50 (a-b)	Career and Financial Management	I can understand the necessity of establishing and maintaining credit in today's society	- Cost of credit - Legal aspects of different forms of credit	[Journal entry on maintaining credit]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
13-50 (c-d)	Presentation Skills	I can prepare a poster board presentation of my project.	Poster board preparation and presentation (present in hallway)	Poster board presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
13-51 (a-b)	Career and Financial Management	I can describe Credit Purchasing	- Product information - Alternative methods of financing a purchase using credit	[Journal entry on credit purchasing]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
13-51 (c-d)	Presentation Skills	I can prepare a poster board presentation of my project.	Poster board preparation and presentation (present in hallway)	Poster board presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
14-52 (a-b)	Career and Financial Management	I can define the function and role of Insurance	- Determine risk, risk tolerance, and loss prevention - Examine types of insurance associated with different types of risk - Understand consequences of not carrying insurance	[Journal entry on risk and risk tolerance]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
14-52 (c-d)	Presentation Skills	I can prepare a poster board presentation of my project.	Poster board preparation and presentation (present in hallway)	Poster board presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	
14-53 (a-b)	Career and Financial Management	I can describe consumer protection laws and agencies	- Identify legislation that regulates consumer credit and electronic credit transactions - Discuss consumer protection legislation	[Journal entry on legislation that regulates consumer credit]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
14-53 (c-d)	Presentation Skills	I can prepare and present a poster board presentation of my project.	Poster board preparation and presentation (present in hallway)	Poster board presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.	

15-54 (a-b)	Career and Financial Management	I can describe consumer protection laws and agencies	- Investigate sales fraud and identify remedies - Describe assistance provided by private and public protection agencies - Compare and contrast consumer protection in e-commerce as provided by the United States	[Journal entry on sales fraud]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
15-54 (c-d)	Presentation Skills	I can prepare and present a poster board presentation of my project.	Poster board preparation and presentation (present in hallway)	Poster board presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
15-55 (a-d)	NYHS Symposium	I can present a poster board presentation of my project at a high school science and engineering fair. (film presentations)	Poster board presentation	Poster board presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
16-56 (a-b)	Project Management	I can list potential project advisors and mentors for my project of interest – STEP 03a.	Create a list of topic experts – STEP 03a	STEP 03a	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
16-56 (c-d)	Water Quality	I can sample for water physical-chemical and biological parameters.	Sample physical-chemical parameters enterococcus at east vs. west sides of GI	Samples of water quality parameters	Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
16-57 (a-b)	Project Management	I can create a proper e-mail to contact project advisors.	E-mail creation for advisors	Contact with advisors to answer project questions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
16-57 (c-d)	Project Management	I can contact advisors regarding my topic of interest.	Contact advisors	Contact with advisors to answer project questions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
17-58 (a-b)	Marine Ecology	I can prepare Invertebrate Sampling Lines (ISLs) - Baggywrinkles	Prepare ISLs	ISLs prepared	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

17-58 (c-d)	Marine Ecology	I can install ISLs – Baggywrinkles.	Install ISLs	ISLs Installed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
17-59 (a-d)	Project Management	I can contact advisors regarding my topic of interest.	Contact advisors	Contact with advisors to answer project questions.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
18-60 (a-d)	Lab/Field Procedures	I can inventory and organize my sampling supplies. (Set ISLs in Pier 101. Ropes to be left over the summer for succession studies and zoology during 11th grade)	Lab/Field procedures	Research lab prepared for summer research.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
18	(Regents Week)	(Regents Week)	(Regents Week)	(Regents Week)	(Regents Week)		

Grade 11 - 12 – Summer Marine Biology Research Program - Advanced Research Methods *

Week	Topics	Learning Targets	Activities	Student Work Products	NYS CDOS Learning Standards	NYS Standards	Common Core Standards
1	Project Management	01. I can design a data storage system. 02. I can collect and process project data.	Design, collect and process project data.	Designed, collected and processed project data.	Standard 1: Career Development Standard 3b: Career Majors		
2	Project Management	I can collect and process project data.	Collect and process project data.	Collected and processed project data.	Standard 1: Career Development Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
3	Project Management	I can collect and process project data.	Collect and process project data.	Collected and processed project data.	Standard 1: Career Development Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
4	Project Management	I can collect and process project data.	Collect and process project data.	Collected and processed project data.	Standard 1: Career Development Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science,	R3. Follow precisely a complex multistep procedure when carrying out experiments,

						and technology to address real-life problems and make informed decisions.	taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
5	Project Management	I can collect and process project data.	Collect and process project data.	Collected and processed project data.	Standard 1: Career Development Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
6	Project Management	Present project data.	Present project data.	Present project data.	Present project data.		

**11th and 12th graders will work on collecting data for their research projects. This semester will also count for their Internship experience.*

Grade 12 – Fall Term – Advanced Marine Research I

Wk-Dy (lesson)	Topics	Learning Targets	Activities	Student Work Products	NYS CDOS Learning Standards	NYS Standards	Common Core Standards
01-01 (a-d)	Presentation Skills	I can present my summer research/internship experience.	Project/internship presentations	Project/internship (slide show) presentations.	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		
02-02 (a-b)	Technical Reading + Writing	I can describe in 2 sentences each PRJA I summarized over the summer.	PRJA class presentations	PRJA presentations	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		
02-02 (c-d)	Project Management	I can update and present my long-term research project status.	Update chronogram and schedule for projects.	Updated research plan, chronograms, and sampling schedules	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		
02-03 (a)	UHS	I can describe the UHS program, materials needed, and determine my eligibility to apply for college credit. (MLP 06 - Literature review slide show and 1st research report draft due weeks 5 + 6)	UHS and course syllabus slide show presentation; (MLP 06 - Literature review slide show and 1st research report draft due weeks 5 + 6)	Journal entry (MLP 06 - Literature review slide show and 1st research report draft due weeks 5 + 6)	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		
02-03 (b)	Project Management	I can properly keep a calendar, theory notebook, research journal, + portfolio. (MLP 06 - Literature review slide show due weeks 5 + 6) (Step 03a due next week)	Calendar, theory notebook, research journal, and portfolio slide show (MLP 06 - Literature review slide show due weeks 5 + 6) (Step 03a due next week)	Journal entry (MLP 06 - Literature review slide show due weeks 5 + 6) (Step 03a due next week)	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
02-03 (c)	STEM GIS - L1 + Career and Financial Management	01a. I can describe what geospatial technology is, its uses in STEM, and career pathways involved.	GIS independent thinking exercise	Independent Thinking Exercise on basic geospatial technology, STEM uses, and careers	Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
02-03 (d)	STEM GIS - L2 +	01b. I can identify geospatial careers in STEM.	Career pathways in alternative energy	Alternative energy career pathways exercise	Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use,	R3. Follow precisely a complex multistep procedure when carrying out experiments,

	Career and Financial Management					and evaluate products and systems to satisfy human and environmental needs.	taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-04 (a)	STEM GIS - L3	I can identify which alternative energies are abundant in my area.	Basic ArcGIS skills such as: opening an existing map, navigating data frames, expanding layers, *etc*.	Data of alternative energy attributes at the national, regional, and local level from existing maps	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-04 (b-d)	Marine Ecology	I can practice phytosociological methods of percent cover to measure a model coral reef.	Measure percentage cover of a model coral reef	[Data sheets with percent cover data and analysis of these. Add PRIMER LESSONS to this data]	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-05 (a)	STEM GIS - L4	I can determine which green spaces we can preserve in our community.	Basic ArcGIS skills such as: adding and editing data layers, using zooming techniques, selecting tabular data, *etc*. based on water and wetland resource GIS data of New Paltz, N.Y.	Basic map manipulation for water and wetlands resources of New Paltz, N.Y.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-05 (b)	STEM GIS - L5	I can identify strategic localities for biodiesel fuel development.	Basic ArcGIS skills such as: Creating an address locator, geocoding addresses, creating reports in ArcMap, *etc*. based on energy conservation and biofuels	Reports on energy conservation and biofuels using ArcMap	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-05 (c)	STEM GIS - L6	I can use geospatial technology for conservation biology.	Basic ArcGIS skills such as: Creating a map, creating shape files, editing symbology, *etc*. based on conservation biology	Map with a buffer zone for bald eagle and endangered plant protection	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-05 (d)	Project Management	I can collect project data. **Project Conferences**	Collect project data **Project Conferences**	Project data. **Project Conferences**	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
04-06 (a)	Ecology	I can describe the distribution of aquatic communities in N.Y.S.	List of NYS communities using NY Natural Heritage Program http://www.acris.nynhp.org/	Tidal River classification	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler

							but still accurate terms.
04-06 (b)	GIS	I can use GIS to define the Hudson River watershed and study fluvial processes of the Hudson River.	Identify tributaries and associated lakes of the HR using GE and ArcGIS	Map of the HR watershed with geographical features	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
04-06 (c)	GIS	I can use GE to explore shoreline processes.	Use GIS to explore shoreline processes of NYC and Long Island.	Map of the HR watershed with geographical and erosion/deposition features	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
04-06 (d)	Project Management	I can collect project data. **Project Conferences**	Collect project data **Project Conferences**	Project data. **Project Conferences**	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
04-07 (a)	STEM GIS - L7	I can use geospatial data to calculate a biomass potential.	Basic ArcGIS skills such as: Merging shapefiles in ArcMap, clipping shapefiles in ArcToolBox, adjusting a shapefiles transparency, etc based on the assessment of woody biomass potential	Map showing the potential biomass territory of a wooded area	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
04-07 (b)	STEM GIS - L8	I can evaluate funding potential for watersheds using GIS.	Basic ArcGIS skills such as: Creating a map from scratch, exporting a data layer, editing layer properties, *etc*. based on watershed ecology	Map depicting a segment of a creek that has been polluted in order to use as a tool for its cleanup.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
04-07 (c)	STEM - L9	I can use geospatial data to create, restore, enhance, and preserve a wetland.	Basic ArcGIS skills such as: using bookmarks, arranging layers in ArcMap, adding imagery, *etc*. based on wetland ecology management and wetland management	Map depicting the best place to build a new facility in a wetland and looking for a specific plot for a company selling wetland credits	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
04-07 (d)	Water Quality	I can prepare materials for sampling physical-chemical and biological parameters across Buttermilk Channel.	Prepare sampling materials	Sampling materials prepared	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or

							exceptions defined in the text.
05-08 (a-d)	Water Quality **(With Vessel Ops)**	I can sample physical-chemical and biological parameters across Buttermilk Channel.	Sample Buttermilk Channel (various depths physical-chemical sampling; surface sampling of enterococcus; plankton sampling on way back)	Buttermilk Channel sampled	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-09 (a)	STEM GIS - L10	I can create a carbon map of the US.	Basic ArcGIS skills such as: editing map layout information, loading an animation file, creating animation in ArcMap based on carbon mapping	Animated map of carbon to be viewed outside of ArcMap	Standard 2: Integrated Learning Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-09 (b)	Fundamentals of Geospatial Technology - L1	I can explain the basics of ArcGIS.	Use the basic functions of ArcGIS	Basic functionality of ArcGIS reviewed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-09 (c)	Fundamentals of Geospatial Technology - L2	I can explain the basics of Global Positioning Systems.	Use a GPS to get 3 waypoints, sketch a map of the study area, and answer the analysis questions	Waypoints, map, and analysis of study area	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-09 (d)	Project Management	I can collect project data.	Collect project data	Project data.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
06-10 (a-b)	Fundamentals of Geospatial Technology - L3	I can explain the basics of remote sensing.	Edit a raster map to practice remote sensing techniques	Polygon map of La Playa Community College	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
06-10 (c)	Vertebrate Zoology	I can compare and contrast mammalian body forms and evolutionary relationships.	Marine mammal anatomy and phylogeny theory	Journal entry regarding anatomy of various mammalian body forms	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

						ideas in science.	
06-10 (d)	Vertebrate Zoology	I can describe the various marine birds around GI	Take a tour of GI and ID marine birds	ID marine birds on worksheet	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
06-11 (a-b)	Fundamentals of Geospatial Technology - L4	I can explain the basics of surveying technology.	Create a map of the research lab	Scale and attribute map of the MBRP lab	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
06-11 (c-d)	Fundamentals of Geospatial Technology - L5	I can explain the combination of different geospatial technologies.	Create a map using all the components of geospatial technology on ArcGIS	Exported map project	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
07-12 (a-d)	Vertebrate Zoology **(AMNH)**	I can explore the evolutionary relationships of marine vertebrates	Visit hall of Marine Life	Phylogeny of marine vertebrates defined on phylogenic tree	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
07-13 (a)	GIS Project Management - L1	I can plan for a GIS project.	Perform a Stakeholder Analysis	Stakeholder analysis list and Lesson Review questions	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
07-13 (b)	GIS Project Management - L2	I can describe the implementation of a GIS project.	Perform a Data Needs Exercise	Data Needs and Possible Sources exercise complete; Lesson Review questions completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
07-13 (c-d)	Project Management	I can collect project data. **Project Conferences**	Collect project data **Project Conferences**	Project data. **Project Conferences**	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

08-14 (a-b)	GIS Project Management - L3	I can explain the presentation of a GIS project.	Project Presentation Community Forum Exercise to communicate findings of a GIS project	Proposed media list to communicate findings of a GIS project; Lesson Review questions completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
08-14 (c-d)	Marine Ecology	I can describe the ecology of the benthos of the continental shelf and littoral sediments (Barnes, 2004).	Documentary of benthos ecology	Journal entry of theory	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
08-15 (a)	Introduction to GIS Concepts - L1	I can describe the history of mapping.	Map Categorization Exercise; Lesson Review; HW: Cartography Timeline exercise	Categorized maps and Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	
08-15 (b)	Introduction to GIS Concepts - L2	I can explain coordinate systems and their relation to location.	Absolute Location Exercise	Locations converted from DD to DMS and vice versa; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
08-15 (c)	Marine Ecology	I can describe the ecology of salt-marshes, mangroves, and sea-grass beds (Barnes, 2004).	Theory Lesson	ANT of Lesson	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
08-15 (d)	Water Quality	I can prepare materials for sampling physical-chemical and biological parameters across Buttermilk Channel.	Prepare sampling materials	Sampling materials prepared	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
09-16 (a-d)	Water Quality **(With Vessel Ops)**	I can sample physical-chemical and biological parameters across Buttermilk Channel.	Sample Buttermilk Channel (various depths physical-chemical sampling; surface sampling of enterococcus; plankton sampling on way back)	Buttermilk Channel sampled	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
09-17 (a)	Introduction to GIS Concepts - L3	I can define map projections.	Map Projections Exercise	2D representation of a 3D globe; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal	Standard 5: Students will apply technological knowledge and skills to design, construct, use,	R2. Determine the central ideas or conclusions of a text; summarize complex concepts,

					Foundation Skills Standard 3b: Career Majors	and evaluate products and systems to satisfy human and environmental needs.	processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
09-17 (b)	Introduction to GIS Concepts - L4	I can describe the role of map coordinate systems in GIS.	Map Coordinate Systems Exercise	UTM map read and scale determined using UTM Corner Grid Reader; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
09-17 (extra)	Introduction to GIS Concepts - L5	I can describe the role of scale in GIS.	Map Scale Exercise	Scales of various maps determined; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
09-17 (c)	Introduction to GIS Concepts - L6	I can define the various map types and other map essentials.	Various map type activity	Various map type characteristics determined; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
09-17 (d)	Introduction to GIS Concepts - L7	I can review the science of Geographic Information Systems.	GIS Fundamentals & Geographic Relationships activity	Completed GIS fundamentals and relationships questions; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
10-18 (a-d)	Marine Ecology **(HRP)**	I can describe the ecology of rocky shores and kelp forests (Barnes, 2004).	Ecology of rocky shores – Harlem River Park (Dudley *et. al.*, 2012)	Rocky shore characterization	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
11-19 (a)	Introduction to remote sensing concepts in GIS - L1	I can relate remote sensing with aerial photography.	Aerial photo exercise from USGS website	Local image downloaded from USGS and specific information attached	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
11-19 (b)	Introduction to remote sensing concepts in GIS - L2	I can build data layers from aerial photographs.	Build data layers from aerial photography	Map with data layers on a transparency; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or

							exceptions defined in the text.
11-19 (c)	Introduction to remote sensing concepts in GIS - L3	I can relate remote sensing to satellite imagery.	Classify Remote Sensing & Satellite Imagery	Remote Sensing & Satellite Imagery classified; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
11-19 (d)	Introduction to remote sensing concepts in GIS - L4	I can identify geographic features using imagery.	Locate features using 2 different types of grids of Washington, DC	Features of located	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
12-20 (a-b)	Project Management	I can synthesize and analyze project data during independent study. **Project Conferences**	Analyze project data **Project Conferences**	Project data analyzed **Project Conferences**	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
12-20 (c-d)	Marine Ecology	I can describe the ecology of coral reefs (Barnes, 2004) and identify coral reef formations around the world using GIS.	Characterize a coral ecosystem model	Graphs and analysis of percent coral cover of principal benthic components	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
12-21 (a-d)	Water Quality **(Vessel Ops)**	I can sample physical-chemical and biological parameters across Buttermilk Channel.	Sample Buttermilk Channel (various depths physical-chemical sampling; surface sampling of enterococcus; plankton sampling on way back)	Buttermilk Channel sampled	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
13-22 (a-b)	Introduction to GPS technology in GIS - L1	I can describe and use GPS technology in GIS.	Survey the basic functionality of a GPS receiver	GPS data collection and waypoints; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
13-22 (c-d)	Introduction to GPS technology in GIS - L2	I can practice the use of geocaching in GIS.	Geocache with a GPS at GI	Geocaching localities found	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

13-23 (a)	Understanding spatial data in GIS - L1	I can explain the basics of ArcMAP.	Practice basic ArcMap functionality such as: launching a map, navigating a map display, identifying features, and vector vs. raster data in identifying data	Basic ArcMap functionality practiced and completion of ArcMap Lesson Review	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
13-23 (b)	Understanding spatial data in GIS - L2	I can navigate through ArcMAP.	Continue practicing basic ArcMap functionality	Navigating ArcMap worksheet completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
13-23 (c)	Understanding spatial data in GIS - L3	I can explain the basics of ArcCatalog.	Practice basic ArcCatalog functionality such as: launching ArcCatalog, viewing data contents, previewing data, and viewing metadata among others	Basic ArcCatalog functionality practiced and completion of ArcCatalog Lesson Review	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
13-23 (d)	Understanding spatial data in GIS - L4	I can navigate through ArCatalog.	Continue practicing basic ArcCatalog functionality	Navigating ArcCatalog worksheet completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
14-24 (a)	I can manage a data inventory in GIS - L(1)1	I can plan a GIS project.	Complete the Project Planning Exercise	Completed Problem Identification Statement, Stakeholder Analysis, Project Objective & Project Title	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	
14-24 (b-c)	I can manage a data inventory in GIS - L(1)2	I can display geospatial data.	Create a map display of the community inventory of Atlanta, GA and a layout of this base map	Layout and map display of the community inventory of Atlanta, GA; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
14-24 (d)	I can manage a data inventory in GIS - L(2)1	I can manage geospatial data.	Manage data from an existing map such as using non-spatial data, selecting features by attribute, selecting features by location, labeling features interactively, among others	Map layout with chosen managed data; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
14-25 (a-b)	I can manage a data inventory in GIS - L(2)2	I can present a GIS project (exercise 01).	Present a project in GIS	GIS project presentation	Standard 2: Integrated Learning Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address	W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in

						real-life problems and make informed decisions.	response to ongoing feedback, including new arguments or information.
14-25 (c-d)	Project Management	I can synthesize and analyze project data during independent study. **Project Conferences**	Analyze project data **Project Conferences**	Project data analyzed **Project Conferences**	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
15-26 (a-b)	GIS	**MIDTERM (Practice for Final)**	GIS introduction midterm	GIS introduction midterm	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		
15-26 (c-d)	Presentation Skills	I can prepare a basic poster presentation and format the written report	Prepare poster board; Practice presentations	Poster board presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
15-27 (a-d)	Presentation Skills	I can prepare a basic poster presentation	Prepare poster board; Practice presentations **4th (final) draft of written report due**	Poster board presentation; Final research paper due; **4th (final) draft of written report due**	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
16	Presentation Skills **(Christmas Break)**	I can prepare a basic poster presentation	Prepare poster board	Poster board presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
17-28 (a-d)	Project Management	I can prepare a basic poster presentation.	Prepare poster board; Mentor search	Project preparation; Poster draft due	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
17-29 (a-d)	Project Management	I can present a basic poster presentation.	Present poster board; Mentor search	Project presentations; Poster draft due	Standard 2: Integrated Learning		W6. Use technology, including the Internet, to produce,

		(Will count as midterm.)			Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
18	(Regents Week)	(Regents Week)	(Regents Week)	(Regents Week)	(Regents Week)		

Grade 12 – Spring Term – Advanced Marine Research II

Wk-Dy (lesson)	Topics	Learning Targets	Activities	Student Work Products	NYS CDOS Learning Standards	NYS Standards	Common Core Standards
01-30 (a-b)	I can manage a data inventory in GIS - L3	I can create geospatial data.	Create geospatial data	Shapefiles created with feature symbology; Lesson Review completed	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
01-30 (c-d)	I can manage a data inventory in GIS - L(4)1	I can analyze geospatial data.	Explore advanced selection methods by using Select by Attribute and Select by Location using ArcToolbox	Map layout with buffer zone; Lesson Review completed	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
01-31 (a-b)	I can manage a data inventory in GIS - L(4)2	I can present a GIS project (exercise 02).	Present a project in GIS	GIS project presentation	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
01-31 (c-d)	I can manage a data inventory in GIS - L5	I can prepare geospatial data.	Prepare geospatial imagery for use in ArcGIS	Map with prepared geospatial imagery; Lesson Review completed	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
02-32 (a-b)	Planning and building a local inventory in GIS - L1	I can plan to build a local inventory.	Begin building a data inventory of Lower Manhattan and GI	Map with local data inventory	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
02-32 (c-d)	Planning and building a local inventory in GIS -	I can create a local data inventory.	Continue building a data inventory of Lower Manhattan and GI	Map with local data inventory	Standard 2: Integrated Learning Standard 3a: Universal	Standard 5: Students will apply technological knowledge and skills to design, construct, use,	R3. Follow precisely a complex multistep procedure when carrying out experiments,

	L2				Foundation Skills	and evaluate products and systems to satisfy human and environmental needs.	taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
02-033 (a-b)	Planning and building a local inventory in GIS - L3	I can create a geodatabase.	Build a file geodatabase	File geodatabase of local geospatial data	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
02-33 (c-d)	Planning and building a local inventory in GIS - L4	I can present a project (exercise 03).	Present a project in GIS	GIS project presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
03-34 (a-b)	Demographic & economic data analysis techniques in GIS - L1	I can display geospatial data.	Use advanced tools to implement and display data using ArcGIS	Map of the manufacturing population in Rankin, MS; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-34 (c-d)	Demographic & economic data analysis techniques in GIS - L2	I can manage geospatial data.	Use advanced tools to manage geospatial data using ArcGIS	Map of population analysis of Rankin, MS; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-035 (a-b)	Demographic & economic data analysis techniques in GIS - L3	I can query geospatial data.	Use advanced tools to query geospatial data using ArcGIS	Map of optimum site locations for a business in Rankin, MS; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
03-35 (c-d)	Demographic & economic data analysis techniques in GIS - L4	I can symbolize geospatial data.	Explore elevation data and its correlation with flood zone data	Map of elevation and flood zones of Rankin, MS; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
04-36 (a)	Demographic & economic data analysis techniques in GIS - L5	I can create geospatial data.	Create a hyperlink to an image file from a map	Map of business locations in Florence, MS with a hyperlink to a satellite image; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or

							exceptions defined in the text.
04-36 (b)	Demographic & economic data analysis techniques in GIS - L6	I can plan and build a local data inventory.	Create a map of the different types of businesses in Lower Manhattan	Map of the locations of a particular business type in Lower Manhattan; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
04-36 (c-d)	Location-based analysis techniques in GIS - L(1)2	I can prepare a GIS project (exercise 04).	Complete a project plan	Problem identification statement completed, stakeholders identified, project objectives identified	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-37 (a)	Location-based analysis techniques in GIS - L(1)2	I can manage geospatial data with location-based analysis techniques.	Explore and analyze Calls for Service (CFS) data	Map of high risk areas for crime in Medford, NJ	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-37 (b)	Location-based analysis techniques in GIS - L(1)3	I can present a project (exercise 04).	Present a project in GIS	GIS project presentation; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
05-37 (c-d)	Location-based analysis techniques in GIS - L2	I can create and edit geospatial data.	Use advanced tools to create and edit geospatial data using ArcGIS	Map of parcel changes in Medford, NJ; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-38 (a-b)	Location-based analysis techniques in GIS - L3	I can model geospatial data.	Create an model of analysis in ArcToolbox	Model and map for high risk areas of Medford, NJ; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
05-38 (c-d)	Location-based analysis techniques in GIS - L4	I can plan and build a local data inventory with location-based analysis techniques.	Plan and build a local data inventory	Map of areas of highest risk of crime or emergency activity	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

06-39 (a-d)	Data collection methods and techniques in GIS - L1	I can explain advanced coordinate systems and projections concepts.	Use advanced tools to study coordinate systems and projections in ArcGIS	Coordinate Systems and Projections activity log; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
07-40 (a)	Data collection methods and techniques in GIS - L2	I can create new data by digitizing imagery.	Create new geospatial data by digitizing imagery using AcrGIS	Map of a digitized school campus; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
07-40 (b)	Data collection methods and techniques in GIS - L(3)1	I can collect geospatial data using GPS.	Using advanced GIS tools and GPS to collect geospatial data	Map of GPS collected data	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
07-40 (c)	Data collection methods and techniques in GIS – L(3)2	I can keep a GPS recoding log.	Continue using advanced GIS tools and GPS to collect geospatial data	GPS point log worksheet; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
08-41 (a-b)	Experiments in skills applications using GIS - L1	I can study a historical preservation case using GIS.	Create a map of a historical preservation case study	Map of a historical preservation case study	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
08-41 (c-d)	Experiments in skills applications using GIS - L2	I can study a real estate case using GIS.	Create a map of a real estate case study	Map of a real estate case study	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
08-42 (a-d)	Experiments in skills applications using GIS – L3	I can study a community comparison case using GIS.	Create a map of a community comparison case study	Map of a community comparison case study	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
09-43 (a-b)	Application in surface analysis using GIS - L(1)1	I can map distance.	Measure map distance using Spatial Analyst in ArcGIS	Map of distances using Spatial Analyst	Standard 2: Integrated Learning Standard 3a: Universal	Standard 5: Students will apply technological knowledge and skills to design, construct, use,	R3. Follow precisely a complex multistep procedure when carrying out experiments,

					Foundation Skills	and evaluate products and systems to satisfy human and environmental needs.	taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
09-43 (c-d)	Application in surface analysis using GIS - L(1)2	I can complete an enrichment exercise in mapping distance.	Measure map distance using the Cost Distance Method in ArcGIS	Map of distances using the Cost Distance Method; Lesson Review completed	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
10-44 (a-d)	Application in surface analysis using GIS - L(2)1	I can map density.	Map density using Spatial Analyst in ArcGIS	Map comparing the kernel vs. point density methods	Standard 1: Career Development Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
10-45 (a-d)	Application in surface analysis using GIS - L(2)2	I can complete an enrichment exercise mapping density.	Continue mapping density using Spatial Analyst in ArcGIS	Map of density of NYS; Lesson Review completed	Standard 1: Career Development Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
11-46 (a-b)	Application in surface analysis using GIS - L(3)1	I can interpolate geospatial data.	Map an elevation surface using different interpolation methods in Spatial Analyst	Map comparing the Inverse Distance Weighted, Spline, and Kriging methods	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
11-46 (c-d)	Application in surface analysis using GIS - L(3)2	I can complete an enrichment exercise in interpolating geospatial data.	Map an elevation surface using different interpolation methods in Spatial Analyst	Map comparing the Inverse Distance Weighted, Spline, and Kriging methods; Lesson Review completed	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
11-47 (a-b)	Application in surface analysis using GIS - L(4)1	I can analyze surface data.	Analyze surfaces using different methods in Spatial Analyst	Map comparing the Aspect, Contour, Curvature, Cut/Fill, Hillshade, Slope, and Viewshed methods	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
11-47 (c-d)	Application in surface analysis using GIS - L(4)2	I can complete an enrichment exercise in analyzing surface geospatial data.	Analyze surfaces using different methods in Spatial Analyst	Map comparing the Aspect, Contour, Curvature, Cut/Fill, Hillshade, Slope, and Viewshed methods; Lesson Review completed	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or

							exceptions defined in the text.
12-48 (a-d)	Application in surface analysis using GIS - L(5)1	I can create grid statistics.	Create grid statistics for raster data	Map comparing cell, neighborhood, and zonal statistics	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
12-49 (a-d)	Application in surface analysis using GIS - L(5)2	I can complete an enrichment exercise creating grid statistics.	Create grid statistics for raster data	Map comparing cell, neighborhood, and zonal statistics; Lesson Review completed	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
13-50 (a-b)	Application in surface analysis using GIS - L(6)1	I can apply my GIS skills towards a spatial analysis project (exercise 05).	Complete a project plan	Problem identification statement completed, stakeholders identified, project objectives identified	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
13-50 (c-d)	Application in surface analysis using GIS - L(6)2	I can exercise planning my project.	Use the Raster Calculator to clip data to a defined extent and query land use to determine sensitive areas	Map created using Raster Calculator with land use and sensitive areas	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
13-51 (a-d)	Application in surface analysis using GIS - L(5)2	I can create a professional map to present my GIS project.	Create a professional map to present a project	Professional map created of Land use and sensitive areas; Lesson Review completed	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
14-52 (a-d)	Application in surface analysis using GIS - L(5)2	I can create a professional map to present my GIS project.	Create a professional map to present a project	Professional map created of Land use and sensitive areas; Lesson Review completed	Standard 3a: Universal Foundation Skills Standard 3b: Career Majors	Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.	R3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
14-53 (a-d)	GIS	**FINAL EXAM**	**FINAL EXAM**	**FINAL EXAM**	**FINAL EXAM**		
15-54 (a-d)	Presentation Skills	I can prepare and present a poster board presentation of my project.	Poster board preparation and presentation (present in hallway)	Poster board presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills	Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make	W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback,

						informed decisions.	including new arguments or information.
15-55 (a-d)	NYHS Science and Engineering Fair	I can present a poster board presentation of my project at a high school science and engineering fair. (film presentations)	Poster board presentation	Poster board presentation	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
16-56 (a-d)	Technical Reading + Writing	I can format a research report into a journal article format.	Format research monograph using journal article parameters.	Formatted articles	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
16-57 (a-d)	Technical Reading + Writing	I can format a research report into a journal article format.	Format research monograph using journal article parameters.	Formatted articles	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		W6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
17-58 (a-d)	Technical Reading + Writing	I can proof read and edit journal articles.	Proof read other students' journal articles.	Articles proof read	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
17-59 (a-d)	SUBMIT ARTICLE	Submit final journal articles.	Final Journal articles.	Final Journal articles	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills		R7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
18-60 (a-d)	Lab/Field Procedures	I can inventory and organize my research supplies.	Lab/Field procedures	Research lab prepared for summer research.	Standard 2: Integrated Learning Standard 3a: Universal Foundation Skills Standard 3b: Career Majors		
18	(Regents Week)	(Regents Week)	(Regents Week)	(Regents Week)	(Regents Week)		

Rubric to Evaluate Student Progress at Internship

Internship	Exemplary 5-4	Meets Proficiency 3-2	Below Proficiency 1-0	Score	Weighting	Total Score
Performance						
Introduction	Meets and/or exceeds all criteria for proficiency	Articulates the relevance of own academic study and choices that have led to a specific area of inquiry; explains in what way the internship experience was expected to extend and refine the student's undergraduate education and personal development	Fails to meet proficiency criteria			
Setting		Describes the internship setting, role, and responsibilities; provides evidence of internship experience				
Integrative Learning		Shows evidence of applying diverse skills and knowledge areas across diverse real-world situations				
Self Knowledge and Growth		Describes personal identity, values, and ethics and how the self has shifted as a result of the internship experience; indicates tolerance for ambiguity; and identifies the link between one's self development and the area being studied (subject, issue, etc.)				
Civic identity and Commitment		Describes what student has learned about self from internship experiences, and how these learning experiences have influenced the sense of civic identity and commitment				
Writing Quality						
Logical Organization		Paper is formatted properly; includes all required sections; connections between sections, paragraphs, and sentences are consistently fluid and clear				
Writing quality: awareness of self as a writer and needs of audience		Writer demonstrates a sense of "writer's identity" that promotes reader engagement through insight and self-awareness; writer demonstrates a sense of the readers' needs and expectations and attempts to engage readers on those terms				
References		Sources are disparate (from self; courses, readings, interviews) but identified accurately				
Mechanics		Accurate punctuation and spelling are used throughout the paper				

SOUTHERN OREGON UNIVERSITY

Capstone Criteria and Assessment Resource
Created by Kay M. Sagmiller
Contributors: David Carter, Anne Chambers, Anne Connors, Andy Dungen, David Oline, Dee Perez, Dan Rubenson

http://leap.aacu.org/toolkit/wp-content/files_mf/internshiprubric.pdf

THE URBAN ASSEMBLY
New York
HARBOR
SCHOOL

Work Site Learning Plan

Student Intern: [redacted] Date: [redacted]

The following work site learning plan provides a description of each component of the work experience:

Tasks student will perform:

Student will: Read peer review journal articles; perform scientific field work; collect ecological data on the Asian Shore Crab; enter data into database; process data using Microsoft Excel.

Skills required:

Field safety; technical Reading; Microsoft Office; basic computer skills; water quality monitoring - salinity, temperature and tide.

Work environment (schedule of rotation through major departments):

Fieldwork twice a week at various localities; labwork three times through December 2013 at Manhattan College.

Work processes, technology, and equipment student will use or observe:

Project Management skills; teamwork; Microsoft Excel; Refractometer; caliper; Metric System Measurements.

Safety precautions:

Water safety: use lifevest when entering water deeper than one's waist; gloves for handling crabs and other sharp marine organisms or objects; buddy system at all times when conducting fieldwork; care in handling instruments, including rinsing in filtered water and wiping with lens paper after use.

Dress code and behavior:

Dress code: old clothes that may be damaged, watershoes/boots, protective gloves, hat; Insect Repellant and sunscreen as needed

Behavior: appropriate, professional conduct; care in handling instruments and marine organisms; focused and productive use of time.

Additional comments:

Be punctual to field site and meetings; carry emergency contact information; it is recommended to have water-proof pouches for cell-phone, wallet, keys etc. Carry a bottle of water/beverage and snack when conducting field work.

Student Name (print): [redacted]

Student Signature: [redacted] Date: [redacted]

Mentor Name (print): [redacted]

Mentor Signature: [redacted] Date: [redacted]

Employer Name (print): [redacted]

Employer Signature: [redacted] Date: [redacted]

Parent Name (print): [redacted]

Parent Signature: [redacted] Date: [redacted]

Skill	Rating Scale 3 Above Average 2 Average 1 Below Average			Date Evaluated	Instructors Initials
	3	2	1		
Basic Information Technology + Statistics Skills:					
Turning on and shutting down a computer correctly	✓			Sept 15 '11	
Naming digital files	✓			Sept 30 '11	
Creating and naming digital folders	✓			Oct 5 '11	
Organizing a USB thumb drive	✓			Oct 5 '11	
Data table creation		✓		Nov 30 '11	
Basic statistics (digitizing data on to Microsoft Excel, central tendency)		✓		Jan 20 '12	
Digitizing data on to Microsoft Word		✓		Feb 18 '12	
Search queries on the internet	✓			Apr 05 '12	
Google Earth – Basic functionality*	✓			May 12 '12	
Intermediate Information Technology + Statistics Skills:					
Graphing in Microsoft Excel		✓		Oct 01 '12	
Experimental design (problem definition, hypothesis/null hypothesis formulation, objective definition, variable definition, controls, constants, assumptions, limitations, replicating, pseudoreplicating, task definition, materials definition, protocol definition)		✓		Nov 15 '12	
Intermediate statistics (probability, regression analysis, correlations)		✓		Dec 12 '12	
Boolian logic for internet search engines			✓	Jan 30 '13	
Google Earth – Intermediate functionality*	✓			Feb 21 '13	
ArcGIS – Basic and Intermediate functionality		✓		Mar 18 '13	
Phylogenetic Tree software			✓	April 20 '13	
Bluetooth technology for remote data transfer - telemetry		✓		May 30 '13	
Advanced Information Technology + Statistics Skills:					
Parametric Statistics (error types, t-test, Chi square test, ANOVA, ANCOVA)					
ArcGIS software – Advanced functionality for geographic information processing					
Primer + Permanova applications for non-parametric ecological statistics					
Spip4q application for automated instrument data retrieval					
Hyperterminal application for remote instrument communication					
Radio technology for remote data transfer - telemetry					
Cell phone technology for remote data transfer - telemetry					

Skill	Rating Scale 3 Above Average 2 Average 1 Below Average			Date Evaluated	Instructors Initials
	3	2	1		
Basic Instrumentation Skills:					
	✓			Nov 15 '11	
Maintaining Test Strips	✓			Jan 20 '12	
Using a calibrated stop watch	✓			May 12 '12	
Using a calibrated thermometer					
Intermediate Instrumentation Skills:					
	✓				
Preparing pH standards	✓			Oct 05 '12	
Calibrating pH sensor	✓			Dec 14 '12	
Maintaining an Electrical Conductivity probe	✓			Feb 20 '13	
Measuring mass with a digital balance	✓			Mar 15 '13	
Advanced Instrumentation Skills:					
Maintaining optical probes (*e.g.* dissolved oxygen, chlorophyll)					
RS232 Communication protocol with sensor					
Replacing probes on meters					
Replacing filters for CO2 detection					
Calibrating a LICOR CO2 sensor					
Running a MetOne Particulates sensor					
Running a Magee Scientific Aetholometer Black Carbon sensor					

Skill	Rating Scale 3 Above Average 2 Average 1 Below Average			Date Evaluated	Instructors Initials
	3	2	1		
Basic Chemical Analysis Skills:					
Measuring ammonia concentration using Aquacheck colorimetric test	✓			Oct 1. '11	
Measuring pH using Aquacheck colorimetric test	✓			Oct 20 '11	
Measuring nitrite concentration using Aquacheck colorimetric test	✓			Dec 15 '11	
Measuring nitrate concentration using Aquacheck colorimetric test	✓			Dec 15 '11	
Measuring buffering capacity using Aquacheck colorimetric test	✓			Mar 10 '12	
Measuring phosphate concentration using Aquacheck colorimetric test	✓			Mar 10 '12	
Measuring hardness using Hach colorimetric test	✓			April 5 '12	
Measuring alkalinity using Aquacheck colorimetric test	✓			June 5 '12	
Measuring temperature with a calibrated thermometer	✓			June 5 '12	
Intermediate Chemical Analysis Skills					
Measuring salinity with a refractometer	✓			Oct 5 '12	
Measuring pH with a conductivity probe	✓			Nov 15 '12	
Measuring electrical conductivity with a conductivity probe	✓			Jan 10 '13	
Measuring turbidity with a turbidity tube or Secchi disk	✓			Jan 10 '13	
Measuring current with meter tape, floating device, and chronometer	✓			Mar 1 '13	
Adjusting pH levels of a solution	✓			Mar 15 '13	
Adjusting nutrient levels (hydroponics germination)	✓			May 10 '13	
Advanced Chemical Analysis Skills					
Measuring dissolved oxygen using the Azide modified Winkler Method					
Measuring enterococcus using Enterolert					
Measuring nutrients using photometer					
Measuring nutrients using a spectrophotometer					
Measuring dissolved oxygen using optical probe					
Measuring chlorophyll a using optical probe					

Skill	Rating Scale 3 Above Average 2 Average 1 Below Average			Date Evaluated	Instructors Initials
	3	2	1		
Basic Lab Skills:					
Measuring Length	✓			Sept 20 '11	
Measuring Volume	✓			Sept 20 '11	
Measuring Mass	✓			Oct 5 '11	
Germinating seeds hydroponically	✓			Dec 5 '11	
Substrate establishing (*i.e.* flourite, gravel, and/or sand)	✓			Feb 15 '12	
Aeration applications in biology experiments	✓			Feb 15 '12	
Building and maintaining a fresh water non-re-circulating aquatic ecosystem model	✓			May 5 '12	
Intermediate Lab Skills:					
Disinfecting with chlorine	✓			Oct 5 '12	
Initiating nitrification with ammonia and nitrifying bacteria	✓			Dec 10 '12	
Calculating simple solution concentrations (chemical + biological)		✓		Dec 10 '12	
Building a freshwater re-circulating aquatic ecosystem model	✓			Feb 15 '13	
Maintaining a freshwater re-circulating aquatic ecosystem model	✓			Mar 30 '13	
Neutralizing pH for waste water solutions	✓			April 20 '13	
Advanced Lab Skills:					
Sterilizing with pressure pot					
Calculating energy flow					
Building and installing manifold					
Building and maintaining a brackish and/or salt water aquatic ecosystem model					

Skill	Rating Scale 3 Above Average 2 Average 1 Below Average			Date Evaluated	Instructors Initials
	3	2	1		
Personal Characteristics:					
Relations with others (effectiveness in working with students, instructors, and others; cooperation; shows respect)	✓			Oct 30 '11	
Dependability (attendance, punctuality, adherence to schedules and deadlines; consistency and results; perseverance)		✓		Jan 15 '12	
Work Attitudes (willingness to learn; willingness to accept and profit from evaluation; enthusiasm; initiative; commitment; pride in work)		✓		Jan 15 '12	
Communication (listening, speaking, and nonverbal skills; effectiveness in communicating with students; teachers, and others)	✓			Mar 30 '12	
Personal Hygiene/Grooming (personal health care and cleanliness; dresses and maintains self appropriately)	✓			Mar 30 '12	
Job Seeking Techniques:					
Apply information about self and job opportunities in career decision making		✓		Nov 15 '12	
Write a resume		✓		Nov 15 '12	
Prepare a job application form	✓			Nov 15 '12	
Write letters of application and acceptance		✓		Jan 20 '13	
Arrange for personal references		✓		Feb 10 '13	
Apply job search techniques (online job search)	✓			Mar 30 '13	
Arrange a job interview	✓			Mar 30 '13	
Apply job interview techniques		✓		Apr 20 '13	
Evaluate job offers (actual or simulated)	✓			May 20 '13	
Entrepreneurship Awareness:					
Describe five characteristics of a free enterprise economic system (ownership of property, profit motive, risk taking, competition, supply and demand)					
Describe five characteristics of a planned economic system (communal ownership, basic human services provided, communal decision-making, requirements-based, rational resource distribution)					
Name four forms of business ownership (sole proprietorship, partnership, corporation, cooperative)					
Describe advantages and disadvantages of small business ownership					
Identify steps necessary to start a business (evaluate need, site selection, marketing plan, financial plan, management plan)					
Identify personal traits of the entrepreneur (versatility, aspirations, energy, integrity, adaptability, *etc.*)					

HUDSON RIVER
FOUNDATION

17 Battery Place
Suite 915
New York, NY 10004

212-HUDSONR
212-483-7667
(Fax) 212-924-8325
www.hudsonriver.org

Mauricio Gonzalez
UA New York Harbor School
Battery Maritime Building
10 South Street
Slip 7
New York, NY 10004

Dear Mauricio Gonzalez,

I have reviewed and endorse the use of the NOCTI instrument for assessment in the area of Natural Resources and the Digital Quest instrument for assessment in the STARS Geospatial Technician Certification. These instruments align themselves with the Marine Biology Research program of study at the Urban Assembly New York Harbor School.

Sincerely,

James Lodge

a xylem brand

Mauricio Gonzalez
UA New York Harbor School
Battery Maritime Building
10 South Street
Slip 7
New York, NY 10004

Dear Mauricio Gonzalez,

I have reviewed and endorse the use of the NOCTI instrument for assessment in the area of Natural Resources and the Digital Quest instrument for assessment in the STARS Geospatial Technician Certification. These instruments align themselves with the Marine Biology Research program of study at the Urban Assembly New York Harbor School.

Sincerely,

Barrett Gaylord
Northeast Representative
72 Neperan Rd Ste 1S
Tarrytown, NY 10591
O: +1 914.909.2921 M: +1 914.260.6085
bgaylord@ysi.com

National Center for
Secure & Resilient Maritime Commerce
DEPARTMENT OF HOMELAND SECURITY NATIONAL CENTER OF EXCELLENCE

April 12, 2012

Mauricio Gonzalez
UA New York Harbor School
Battery Maritime Building
10 South Street
Slip 7
New York, NY 10004

Dear Mauricio,

I have reviewed and endorse the use of the NOCTI instrument for assessment in the area of Natural Resources and the Digital Quest instrument for assessment in the STARS Geospatial Technician Certification. These instruments align themselves with the Marine Biology Research program of study at the Urban Assembly New York Harbor School.

Sincerely,

Dr. Philip Orton

Post-Doctoral Research Associate
Stevens Institute of Technology
Castle Point on Hudson
613 Babbio Center
Hoboken, NJ 07030

Tuesday, April 24, 2012

Mauricio Gonzalez
UA New York Harbor School
Battery Maritime Building
10 South Street
Slip 7
New York, NY 10004

Dear Mauricio Gonzalez,

I have reviewed and endorse the use of the NOCTI instrument for assessment in the area of Natural Resources and the Digital Quest instrument for assessment in the STARS Geospatial Technician Certification. These instruments seem to align with the Marine Biology Research program of study at the Urban Assembly New York Harbor School. Getting in high school such a focused orientation to the ways of thinking in a discipline and important concepts and skills on which practitioners rely is extremely useful in building a career track and getting a job interview with a similarly focused organization.

Sincerely,

Charlie Fitzpatrick

Charlie Fitzpatrick
Esri Education Manager
2001 15th St N #1403
Arlington, VA 22201 USA
v: 651-994-0823 x.8349
c: 651-323-7280
f: 909-793-5953
e: cfitzpatrick@esri.com
http://edcommunity.esri.com

PORTUS OPTIMUS, INC.

April 10, 2012

Mauricio Gonzalez
UA New York Harbor School
Battery Maritime Building
10 South Street
Slip 7
New York, NY 10004

Dear Mauricio Gonzalez,

I have reviewed and endorse the use of the NOCTI instrument for assessment in the area of Natural Resources and the Digital Quest instrument for assessment in the STARS Geospatial Technician Certification. These instruments align themselves with the Marine Biology Research program of study at the Urban Assembly New York Harbor School.

Sincerely,

Matthew Leahey, CEO
Portus Optimus, Inc.

November 28, 2011

Ms. Holly Carson
Florida Department of Economic Opportunity

Re: Digital Quest SPACE Certification and EIGS

The Enterprise for Innovative Geospatial Solutions is a partnership of over 50 nationally-known geospatial companies and research organizations. EIGS is a successful 12-year program of the Magnolia Business Alliance and is the highest rated of ten business clusters in the nation funded by the 2011-2012 US Small Business Administration Regional Innovative Clusters initiative.

One of our member companies, Digital Quest, has developed the SPACE certification that receives our full backing and sponsorship. The SPACE certification verifies the entry-level geospatial user skills that our companies regard as essential. As our member company, we support Digital Quest's testing instrument, administering, and review of examinations as a member and representative of the EIGS. The resulting certification is signed and authenticated by Digital Quest and backed by the EIGS.

Our members consider this certification a critical, emerging industry standard and hope to see it continue to grow nationwide. If you have any questions about our organization please do not hesitate to contact me directly.

Sincerely,

Craig A Harvey, GISP
President/CEO, Magnolia Business Alliance
13131 Highway 603, Suite 208,
Bay Saint Louis, MS 39520
(228) 242-0015 Office
(228) 342-8395 Cell
(228) 242-0013 Fax
charvey@magnolia-ba.biz
http://www.magnolia-ba.biz

Roger Williams University

One Old Ferry Road, Bristol, Rhode Island 02809-2921
401.253.1040 • 800.458.7144 • www.rwu.edu

MEMORANDUM OF UNDERSTANDING
between
ROGER WILLIAMS UNIVERSITY
Bristol, Rhode Island
and
THE URBAN ASSEMBLY NEW YORK HARBOR SCHOOL
Governors Island, New York

This document defines the mutually agreed upon terms through which students enrolled in the Aquaculture and Marine Biology Research Programs of Study at The Urban Assembly New York Harbor School (NYHS) can transition to the Roger Williams University (RWU) Marine and Natural Sciences Program.

- Faculty of RWU's Marine and Natural Science Program agree to provide on-going scientific expertise and support to the NYHS Faculty in the form of periodic NYHS program reviews, membership on the NYHS Professional Advisory Committee, and/or other avenues of exchange as mutually agreed upon.

- The following applies to NYHS students enrolled in the three-year NYHS Aquaculture or Marine Biology Research Programs of Study:

  a) Annually, two senior-level NYHS students in the Aquaculture Program of Study and two senior-level NYHS students in the Marine Biology Research Program of Study will be invited to formally present their senior projects to students and faculty in the RWU Aquaculture and Marine Biology Programs. This will provide NYHS students with a forum to discuss their research efforts and to exchange ideas with RWU faculty and students. Unless otherwise stipulated, these presentations will be web-based and scheduled to coincide with RWU undergraduate research presentations that are held on a regular basis. The NYHS students will be selected by representatives from both NYHS and RWU.

  b) Annually, one outstanding junior-level NYHS student in the Aquaculture or Marine Biology Research Program of Study will be invited to participate in RWU's Marine Biology camp held each summer at the RWU Bristol campus. The NYHS student will be selected by representatives from both NYHS and RWU. The fee to attend the summer camp program will be waived for the selected participant. This provision is subject to RWU conducting the Marine Biology camp in any given summer.

  c) NYHS students attending RWU and enrolled in RWU's Marine and Natural Science Program that have successfully completed the three year NYHS Aquaculture Program of Study will be eligible to challenge select RWU Aquaculture and Aquarium Science courses (BIO 345 - Aquaculture; AQS 262 - Aquarium System Design) via a RWU challenge exam and receive the corresponding college credits for that course upon satisfactory completion of the exam. The challenge exam will include a portfolio presentation and the exam fee will be waived for NYHS students.

  d) NYHS students attending RWU and enrolled in RWU's Marine and Natural Science Program that have successfully completed the three year NYHS Marine Biology Research Program of Study will be eligible to challenge select RWU Environmental Science and Marine Biology courses (NATSC 204 - Principles of Oceanography; BIO 204 - Introduction to Marine Biology) via a RWU challenge exam and receive the corresponding college credits for that course upon satisfactory completion of the exam. The challenge exam will include a portfolio presentation and the exam fee will be waived for NYHS students.

  e) Outstanding students completing the NYHS Aquaculture or Marine Biology Research Program of Study who have been admitted to RWU will be considered for a number of RWU scholarships.

This Memorandum will be periodically evaluated and reviewed by RWU and NYHS for the purpose of making any necessary refinements and modifications.

RWU's and NYHS's relationship to each other shall be that of independent contractors. Nothing contained in this Memorandum shall make the employees of one party the employees of the other. Each party shall be responsible for managing the affairs of its own respective entity, and in the conduct of their business and in the performance of their respective obligations under this Memorandum each party shall comply with all applicable statutes, ordinances, rules, regulations and licensing requirements of any and all federal, state, and municipal authorities. In addition, each party shall maintain customary, appropriate and, if necessary by law, required levels of insurance (general liability; property & automobile; workers' compensation) during the term of this Memorandum.

The parties shall perform their respective obligations hereunder without regard to the race, color, religion, national or ethnic origin, age, sex, sexual orientation, gender expression or identity, disability, veteran status, or any other legally protected basis of any employee, student or representative.

This Memorandum shall become effective October 1, 2012 and shall be applicable to the NYHS graduating class of 2013 and subsequent classes. This Memorandum may be terminated at any time: a) upon the mutual agreement of both parties; or, b) by either party upon sixty (60) days prior written notice to the other party. Unless otherwise agreed upon, and if notice of termination is provided during either the Fall or Spring RWU academic semesters, the effective date of the termination shall be the last day of such Fall or Spring RWU academic semester.

IN WITNESS WHEREOF, both parties have caused this Memorandum of Understanding to be executed by their respective, duly authorized representatives.

THE URBAN ASSEMBLY NEW YORK HARBOR SCHOOL

By: Edward Biedermann

Name: Edward Biedermann

Title: Principal

Date: 9/21/2012

By:

Name: Peter Malinowski

Title: Aquaculture Program Director

Date: 9/21/12

By:

Name: Mauricio Gonzalez

Title: Marine Biology Research Program Director

Date: 09.21.2012

ROGER WILLIAMS UNIVERSITY

By:

Name: Andrew A. Workman, Ph.D.

Title: Provost and Senior Vice President

Date: 10/2/12

By:

Name: Lonnie J. Guralnick

Title: Interim Dean

Date: 10/2/12

By: Lynn M Fawthrop

Name: Lynn M. Fawthrop

Title: SVP of Enrollment Management & Retention

Date: 10/5/12

RWU OGC REVIEWED 9/27/12

ARTICULATION AGREEMENT

Between

Manhattan College

And

Urban Assembly New York Harbor School (NYHS)
Marine Biology Research Program (MBRP)

We have entered into this Agreement of intent to work together to enhance educational and career opportunities in order to promote seamless, non-duplicative instruction that benefits students, schools, and the community at large.

Developed through secondary and postsecondary school administrative and instructor course review and collaboration, this Agreement gives 6 college credits towards a college degree for the following courses of study to students fulfilling the criteria as stipulated per programs:

BIOL 310 OR BIOL 311 - Research in Biology (3 credits)
AND
3 Free Elective Credits

EDWARD BIEDERMANN Edward Biedermann
Secondary School Official's Name

PRINCIPAL, I.A. 12/18/2012
Title/Date

Constantine E. Theodosiou
Postsecondary School Official's Name

Dean of Science 12/5/12
Title/Date

This agreement is effective as of December 5th, 2012 until either party decides to dissolve it according to established guidelines as determined by the Marine Biology Research Program and Manhattan College.

See Appendix A: Course List – for the list of courses available for college credit under *terms of agreement within each program of study and the list of competencies required for each.*
See Appendix B: Articulation Agreement Competencies – for the courses and competencies the student must complete satisfactorily.
See Appendix C: Application/Verification Form – for the secondary school verification of successful competency attainment.
See Appendix D: Responsibilities

Note: This agreement is between these two schools and is valid for these two institutions only. Courses awarded college credit, through this agreement, are unique to these institutions. No assurance is given that college credit awarded through this agreement will transfer to any other postsecondary institution.

NYHS/NYCDOE Official's Initials: _____ Manhattan College Official's Initials: _____

Appendix A: Course List

For a student to obtain 6 college credits for courses articulated within this program, the student must meet the following criteria:

S/he completes at least 6 college credits in the UHS-SUNY Albany Science Research classes offered at the NYHS in the MBRP.

S/he enrolls at Manhattan College and takes a second class in research (e.g., BIOL 310, 311, 410,411).

S/he transfers the 6 SUNY Albany Science Research Credits awarded in the MBRP to Manhattan College.

The student and the student's program instructor submit the required forms and applications to Manhattan College within the deadlines as determined in the University's Policy and Procedure Manual.

Each student meeting the above criteria can be awarded up to 6 college credit hours of which includes one free elective course and 3 additional credits at Manhattan College for the following articulated courses within this program of study:

Course Number	**Course Title**	**Credits**
BIOL 310 / 311	Research in Biology	3
	Elective Course	3

To know each party's responsibilities under terms of this agreement, please see Appendix D: *Responsibilities*.

Important: In order that the college maintains quality and can assure that quality, it is the college's right to waive courses (or not) as it sees fit. The Office of the Dean is responsible to certify Research in Biology credit after the completion of a second class in research

Please note that all agreements, college credit granted, student promotion, and other decisions are subordinate to the master agreement:

Articulation Agreement between Manhattan College and UA New York Harbor School

Note: This agreement is between these two schools and is valid for these two institutions only. Courses awarded college credit, through this agreement, are unique to these institutions. No assurance is given that college credit awarded through this agreement will transfer to any other postsecondary institution.

Appendix B: Articulation Agreement Competencies

In order for the student to receive credit for this course/these courses at Manhattan College, the following additional competencies are expected:

The requirements of this course as stipulated by Manhattan College are as follows:

1. Attend all regularly scheduled classes.
2. Participate at a level appropriate to present year of course, in the school's annual symposium.
3. Commit to 240 or more hours per school year (September to June) for their research work (this includes class time, assessment meetings, and all out of class time spent on the research).
4. Maintain a laboratory notebook/journal of all research related work starting at beginning of entry into research course.
5. Maintain a comprehensive portfolio of all research work.
6. Present research at all stages of the work, at all available venues and competitions.
7. Maintain regular, demonstrable contact with a mentor once one is obtained.
8. Develop quarterly chronograms, an end of year abstract, an annual reflection and an assessment of goals.

It is mandatory for all students to attend the NYHS research symposium/fair/exposition and present a poster of an article read, their work to date, and their findings. In addition to the posters, all research students will present a PowerPoint talk on their research findings.

Specific course requirements and Projected Dates

The requirements of this course include a minimum of ten hours of outside independent research in every two week cycle during the school year as well as a commitment to a minimum of 90 hours during the sophomore and junior summers. These hours must be documented in a Research Journal, which must be brought to class for each independent session. In addition, other requirements include: at least 4 research paper drafts, the developing of quarterly chronograms, 3 poster board drafts, and 2 Power Point presentations for eligible students. Students will be required to present their work both in class and at third party competitions. Each year it is required to enter 3 or more competitions including the school's Research Fair. It is expected that students will have begun to explore a topic of interest and pursued a mentor during the Prerequisite class Introductory Marine Research in the 10th grade in accordance to a fixed chronogram (figure 1a).

Research Journals are due every two weeks at the individual student-teacher conference; drafts are due according to a fixed schedule (figure 01b); competition deadlines are posted as they become available, chronograms are due at the beginning and midpoint of each semester, the final research paper drafts are due either in January and June; and the end of year abstract, reflections and assessment of goals are due on the last day of class.

NYHS/NYCDOE Official's Initials: DB Manhattan College Official's Initials: CT

Figure 01a. Detailed chronogram of major due dates – 10th grade Prerequisite Course

Item	February				March				April				May				June		
WEEK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 article presentation			X	X	X	X	X												
Poster board drafts														X		X			
Mentor Search	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Final presentation																		X	

Figure 01b. Detailed chronogram of major due dates for College Credit Research Classes

Item	September				October				November				December				January		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Mentor Search	X	X	X	X	X	o	o	o	o	o	o	o							
Formulation	X	X	X	X	X	o	o	o	o	o	o	o	o	o	o	o	o	o	o
IRB – Results	X	X	X	X	X	o	o	o	o	o	o	o	o	o	o	o	o	o	o
5 article presentation			X	X	X	X	X												
Analysis of results or Literature Review	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Written/Slide Show Draft						X													
Written/Slide Show Draft									X										
Written/Slide Show Draft												X							
Final drafts															X				
Poster board drafts												X		X		X			
Final presentation																		X	

Figure 01c. Detailed chronogram of major due dates - continued (o = prolonged schedule)

Item	February				March				April				May				June		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Mentor Search	X	X	X	X	X	X	X												
Formulation	X	X	X	X	X	X	X	X	X	X	X	X							
IRB – Results								X	X	X	X	X	X	X	X	X	X	X	X
Analysis of results													X	X	X	X	X	X	X
Written/Slide Show Draft					X														
Written/Slide Show Draft									X										
Written/Slide Show Draft												X							
Final draft															X				
Poster board drafts							X			X		X		X					
Final presentation															X				

NYHS/NYCDOE Official's Initials: DB Manhattan College Official's Initials: CT

Grading Scheme

Grading will be based on the following components: Research Project (*i.e.* research plan, final drafts, grading sheet), Tech. Read + Write (*i.e.* journal, drafts), Lab/Field Work, Applied Statistics, Conferences and Applications, and Presentations (*i.e.* articles, research fairs). ***Full* participation in the local symposium will account for 20 percent (figure 03) of the final grade, in lieu of a final exam as follows:**

Sophomores will participate in the full symposium and each will produce and present a poster based on a previous peer reviewed article in his/her field.

Juniors will participate in the full symposium and each will produce and present a poster based on her/his own review of pertinent literature and any work done to date under the aegis of a mentor.

Seniors will present both a poster of their research findings and a slide show with a talk of their research findings.

Figure 02. Grading Scheme

Grade Scale	Grade Conversion	Grade Scale	Grade Conversion
93-100	A	73-76	C
90-92	A-	70-72	C-
87-89	B+	67-69	D+
83-86	B	63-66	D
80-82	B-	60-62	D-
77-79	C+	Grade < 60	E

Figure 03. Grading Components

Research Project (*i.e.* research plan, steps, + drafts)	**30 %**
Tech. Read + Write (*i.e.* PRJ article summaries, other summaries)	**05 %**
Research Journal + Portfolio	**10 %**
Lab + Field Work (*i.e.* theory + practice exercises, data collection)	**10 %**
Applied Statistics	**05 %**
Project Conferences	**05 %**
Applications + Forms (*i.e.* college, fair, summer programs, *etc.*)	**05 %**
Practice presentations (*i.e.* articles, drafts, judging sheets)	**10 %**
Final Presentation at local symposium	**20 %**

Attendance policy

Attendance is required at all sessions, unless the student is at their specific research site conducting their work IN WHICH CASE THEY MUST KEEP A DETAILED LOG SHEET WITH DATES, TIMES, AND MENTOR SIGNATURES. No more than 10 absences from the group sessions are allowed in the full year classes. Unexcused absences that occur on the day students are

assigned to present results will result in failure for that day. An unexcused absence from an individual research meeting results in reduction of points on your biweekly grading sheet.

Safety policy

Working in laboratories carries the potential for accidents. All students are expected to behave in a safe manner to prevent mishaps.

Standards of Academic Integrity

Manhattan College and MBRP expects all members of its community to conduct themselves in a manner befitting its tradition of honor and integrity. Members are expected to assist the College and MBRP by reporting suspected violations of academic integrity to appropriate faculty and/or administrative offices. Behavior that is detrimental to the College's and MBRP's role as educational institutions is unacceptable. Claims of ignorance, of unintentional error, or of academic or personal pressures are not sufficient reasons for violations of academic integrity.

The following are examples of the types of behaviors that are defined as academic dishonesty and are therefore unacceptable:

Plagiarism: Presenting as one's own work the work of another person. Plagiarism includes paraphrasing or summarizing without acknowledgment, submission of another student's work as one's own, the purchase of prepared research or completed papers or projects, and the unacknowledged use of research sources gathered by someone else; **Cheating on Examinations:** Giving or receiving unauthorized help before, during, or after an examination; **Multiple Submission:** Submitting substantial portions of the same work for credit more than once; **Sabotage:** Destroying, damaging, or stealing of another's work or working materials; **Unauthorized Collaboration:** Collaborating on projects, papers, or other academic exercises that is regarded as inappropriate by the instructor(s); **Falsification:** Misrepresenting material or fabricating information in an academic exercise or assignment; and **Bribery:** Offering or giving any article of value or service to an instructor in an attempt to receive a grade or other benefits not legitimately earned or not available to other students in the class. **Circumventing Security:** Users are prohibited from attempting to circumvent or subvert any system's security measures. Users are prohibited from using any computer program or device to intercept or decode passwords or similar access control information.

The violations listed above should be reported to the MBRP Director immediately. All parties involved will be directed accordingly.

Appendix C: Application/Verification Form For College Credit

To be completed by the student and the secondary school teacher for the student who has met the secondary school course and/or competency requirements.

Part 1-To be filled out by student:

Student's Name _____ Program _____

Student's Address _____

City _____ Zip Code _____

Teacher's Name _____ Date _____

SUNY Albany Course Number	Course Title	Credits
_____	_____	_____

Manhattan College Course Number	Course Title	Credits
_____	_____	_____

Part 2-To be filled out by instructor:

UA New York Harbor School

Academic Grade _____ Lab Grade (if applicable) _____

Industry/Post-secondary standard(s) met? YES NO Date_____ Not applicable _____

If YES, what standard(s)? _____

Comments

_____

_____

Verified by _____

Secondary School Instructor's Signature / Date

NYHS/NYCDOE Official's Initials: _____ Manhattan College Official's Initials: _____

Appendix D: Responsibilities

WHO	RESPONSIBILITIES
Secondary and Post-Secondary Administration	1. Complete and sign the Program/Course Articulation Agreement Form,
Secondary School Instructor	2. Identifies the course comparable to a college course, 3. Participates in Articulation Agreement development, 4. Explains the Articulated Program and various options to the student, 5. Verifies if the student has completed one or more articulated courses in the Program of Study and has achieved the necessary course competencies and performance levels, 6. Completes the *Application/Verification Form* and submits it to the college granting articulated credit by the required date, 7. Inform students of fee due dates for the college courses being taken, 8. Gives a copy of the *Application/Verification Form* to the student and files a copy with the high school counselor or identified "go-to" person for the student's permanent record, 9. Clearly advises students on all options and ramifications of withdrawing from the course,
High School Counselor or Designee	10. Notifies instructors of the Articulation Agreements and Programs, 11. Helps with students getting on board, 12. Assists instructors and students with the process by getting and supplying materials to enable and support the instructor in doing his/her part, 13. Talks with parents as needed, 14. Maintains a copy of each *Application/Verification Form* in the student's permanent file, 15. Maintains file with all articulation agreements, 16. Collects data on all students at the school site,

High School Student	17. Notifies the appropriate person at the secondary school of his/her intent, 18. Fills out all required hard copy/web forms, including Part 1, the *Application/Verification Form*, 19. Demonstrates course competency at the approved proficiency level, 20. Applies to the college for admittance in a timely fashion and submits transcripts along with the application, 21. Has the instructor complete Part 2 of the *Application/Verification Form* and submit it to the college granting articulated credit, 22. Matriculates at the college within the time frame delineated within the Articulation Agreement,
College Instructor	23. Collaborates with the high school instructor on curriculum-level review, 24. Signs approval for articulation credit as needed,
College Advisor	25. Maintains a copy of the *Application/Verification Form* in the student's academic advising file,
College Registrar	26. Review and records the articulated credit on the student's transcript upon notification that all criteria have been met.

UNIVERSITY AT ALBANY
State University of New York

THE URBAN ASSEMBLY New York HARBOR SCHOOL

ARTICULATION AGREEMENT

Between

State University of New York at Albany

And

Urban Assembly New York Harbor School Science Research Program

We have entered into this Agreement of intent to work together to enhance educational and career opportunities in order to promote seamless, non-duplicative instruction that benefits students, schools, and the community at large.

Developed through secondary and postsecondary school administrative and instructor course review and collaboration, this Agreement gives college credit towards a college degree for the following courses of study to students fulfilling the criteria as stipulated per programs:

ACAS 109* - Intermediate Science Research (2 credits, July - August) - Juniors
ACAS 110 - Intermediate Methods of Research (4 credits, September - June) - Juniors
ACAS 209* - Advanced Science Research (2 credits, July - August) - Seniors
ACAS 210 - Advanced Methods of Research (4 credits, September - June) - Seniors

** Please note that ACAS 109 and ACAS 209 are offered only during the summer.*

Nathan Dudley Nathan Dudley

Secondary School Official's Printed Name + Signature

Principal 1/31/12

Title/Date

DEBERNEE J. PRIVOTT

Postsecondary School Official's Printed Name + Signature

ASSOCIATE DIRECTOR FOR ADMINISTRATION 2/6/12

Title/Date

This agreement is effective as of June 06th, 2012 until either party decides to dissolve it according to established guidelines as stipulated in the Science Research Program's Curriculum and the University in the High School Program's Policy and Procedures Manual.

See Appendix A: Course List – for the list of courses available for college credit under *terms of agreement within each program of study and the list of competencies required for each.*
See Appendix B: Articulation Agreement Competencies – for the courses and competencies the student must complete satisfactorily.
See Appendix C: Application/Verification Form – for the secondary school verification of successful competency attainment.
See Appendix D: Responsibilities
See Appendix E: Program and Course Description

Note: This agreement is between these two schools and is valid for these two institutions only. Courses awarded college credit, through this agreement, are unique to these institutions. No assurance is given that college credit awarded through this agreement will transfer to any other postsecondary institution.

NYHS/NYCDOE Official's Initials: ND SUNY Albany UHS Official's Initials:

Appendix A: Course List

For a student to obtain college credit for courses articulated within this program, the student must meet the following criteria:

S/he completes the high school articulated courses with a grade of 60 or better and meets all required competencies.

S/he passes required written and/or performance evaluations as noted in Appendix B: *Articulation Agreement Competencies*.

The student and the student's program instructor submit the required forms and applications to SUNY Albany within the deadlines as determined in the University in the High School Program Policy and Procedure Manual.

Each student meeting the above criteria can be awarded 2 or 4 college credit hours at the State University of New York at Albany for the following articulated courses within this program of study:

Course Number	Course Title	Credits	Grade
ACAS 109*	**Intermediate Science Research**	**2**	**Juniors**
ACAS 110	**Intermediate Methods of Research**	**4**	**Juniors**
ACAS 209*	**Advanced Science Research**	**2**	**Seniors**
ACAS 210	**Advanced Methods of Research**	**4**	**Seniors**

** Please note that ACAS 109 and ACAS 209 are offered only during the summer.*

To know each party's responsibilities under terms of this agreement, please see Appendix D: *Responsibilities*.

Important: In order that the college maintains quality and can assure that quality, it is the college's right to waive courses (or not) as it sees fit.

Please note that all agreements, college credit granted, student promotion, and other decisions are subordinate to the master agreement:
Articulation Agreement between State University of New York Albany and Urban Assembly New York Harbor School (NYHS)

Note: This agreement is between these two schools and is valid for these two institutions only. Courses awarded college credit, through this agreement, are unique to these institutions. No assurance is given that college credit awarded through this agreement will transfer to any other postsecondary institution.

Appendix B: Articulation Agreement Competencies

In order for the student to receive credit for this course/these courses at State University of New York Albany, the following additional competencies are expected:

The requirements of this course as stipulated by the Science Research Program at the University at Albany are as follows:

1. Attend all regularly scheduled classes (See attendance policy below).
2. Participate at a level appropriate to present year of course, in the school's annual symposium.
3. Commit to 240 or more hours per school year (September to June) for their research work (this includes class time, assessment meetings, and all out of class time spent on the research).
4. Summer research carries a commitment of a minimum 90 hours plus assessment time. These hours include full attendance at your local school symposium for each year that you are in the research course.
5. Maintain a laboratory notebook/journal of all research related work starting at beginning of entry into research course.
6. Maintain a comprehensive portfolio of all research work.
7. Present research at all stages of the work, at all available venues and competitions.
8. Maintain regular, demonstrable contact with a mentor once one is obtained.
9. Develop quarterly chronograms, an end of year abstract, an annual reflection and an assessment of goals.

It is mandatory for all students to attend our annual research symposium and present a poster of an article read, their work to date, and their findings. In addition to the posters, all research students will present a PowerPoint talk on their research findings.

Specific course requirements and Projected Dates

The requirements of this course include a minimum of 10 hours of outside independent research in every 2 week cycle during the school year as well as a commitment to a minimum of 90 hours during the rising junior and senior summers. These hours must be documented in a Research Journal, which must be brought to class for each independent session. In addition, other requirements include: 4 research paper drafts, the developing of quarterly chronograms, 3 poster board drafts, and 2 Power Point presentations for eligible students. Students will be required to present their work both in class and at competitions. Each year it is required to enter 3 or more competitions including the school's Research Fair. It is expected that students will have begun to explore a topic of interest and pursued a mentor during the prerequisite class Introductory Marine Research in the 10th grade in accordance to a fixed chronogram (figure 1a). Research Journals are due every 2 weeks at the individual student-teacher conference; drafts are due according to a fixed schedule (figure 01b); competition deadlines are posted as they become available, chronograms are due at the beginning and midpoint of each semester, the final research paper drafts are due either in January and June; and the end of year abstract, reflections and assessment of goals are due on the last day of class.

NYHS/NYCDOE Official's Initials: ND SUNY Albany UHS Official's Initials:

Figure 01a. Detailed chronogram of major due dates – 10th grade Prerequisite Course

Item	February				March				April				May				June		
WEEK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Mentor Search	>X	X	X	X	X	X	o	o	o	o	o	o	o	o	o	o	o	o	o
Formulation	>X	X	X	X	X	X	X												
5 article presentation			X	X	X	X	X												
IRB – Results				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Analysis of results													X	X	X	X	X	X	X
1st draft									X										
2nd draft													X						
Final draft																	X		
Poster board drafts														X		X			
Final presentation																		X	

Figure 01b. Detailed chronogram of major due dates – A CAS 110 + 210

Item	September				October				November				December				January		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Mentor Search	X	X	X	X	X	o	o	o	o	o	o	o							
Formulation	X	X	X	X	X	o	o	o	o	o	o	o	o	o	o	o	o	o	o
IRB – Results	X	X	X	X	X	o	o	o	o	o	o	o	o	o	o	o	o	o	o
5+ article presentation			X	X	X	X	X												
Analysis of results	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1st draft						X													
2nd draft									X										
3rd draft												X							
Final draft															X				
Poster board drafts												X		X					
Final presentation																		X	

Figure 01c. Detailed chronogram of major due dates – CAS 110 + 210 (o = prolonged schedule)

Item	February				March				April				May				June		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Mentor Search	>o	o	o	o	o	o	o												
Formulation	>o	o	o	o	o	o	o												
5 article presentation			X	X	X	X	X												
IRB – Results	>o	o	o	o	o	o	o	X	X	X	X	X	X	X	X	X	X	X	X
Analysis of results													X	X	X	X	X	X	X
1st draft					X														
2nd draft									X										
Final draft													X						
Poster board drafts												X		X					
Final presentation															X				

NYHS/NYCDOE Official's Initials: ND SUNY Albany UHS Official's Initials:

Grading Scheme

Grades are on an A-E scale and there are no S/U (pass/fail) options (figure 02). Grading will be based on the following components: Research Project (*i.e.* research plan, final drafts, grading sheet), Tech. Read + Write (*i.e.* journal, drafts), Lab/Field Work, Applied Statistics, Conferences and Applications, and Presentations (*i.e.* articles, research fairs). ***Full* participation in the local symposium will account for 20 percent (figure 03) of the final grade, in lieu of a final exam as follows:**

Sophomores will participate in the full symposium and each will produce and present a poster/slide show based on a previous peer reviewed article in his/her field.

Juniors will participate in the full symposium and each will produce and present a poster/slide show based on her/his own review of pertinent literature and any work done to date under the aegis of a mentor.

Seniors will present both a poster of their research findings and slide show with a talk of their research findings.

Figure 02. Grading Scheme

Grade Scale	Grade Conversion	Grade Scale	Grade Conversion
93-100	A	73-76	C
90-92	A-	70-72	C-
87-89	B+	67-69	D+
83-86	B	63-66	D
80-82	B-	60-62	D-
77-79	C+	Grade < 60	E

Figure 03. Grading Components

Research Project (*i.e.* research plan, final drafts, grading sheet)	**30 %**
Tech. Read + Write (*i.e.* journal, drafts)	**10 %**
Lab/Field Work	**10 %**
Applied Statistics	**10 %**
Student-Teacher Conferences and Applications	**10 %**
Practice presentations (*i.e.* articles + drafts)	**10 %**
Final Presentation at local symposium	**20 %**

Attendance policy

Attendance is required at all sessions, unless the student is at their specific research site conducting their work IN WHICH CASE THEY MUST KEEP A DETAILED LOG SHEET WITH DATES, TIMES, AND MENTOR SIGNATURES. No more than 10 absences from the group sessions are allowed in the full year classes. Unexcused absences that occur on the day students are assigned to present results will result in failure for that day. An unexcused absence from an individual research meeting results in reduction of points on your biweekly grading sheet.

Safety policy

Working in laboratories carries the potential for accidents. All students are expected to behave in a safe manner to prevent mishaps.

Standards of Academic Integrity

The University at Albany expects all members of its community to conduct themselves in a manner befitting its tradition of honor and integrity. Members are expected to assist the University by reporting suspected violations of academic integrity to appropriate faculty and/or administrative offices. Behavior that is detrimental to the University's role as an educational institution is unacceptable. Claims of ignorance, of unintentional error, or of academic or personal pressures are not sufficient reasons for violations of academic integrity.

The following are examples of the types of behaviors that are defined as academic dishonesty and are therefore unacceptable:

Plagiarism: Presenting as one's own work the work of another person. Plagiarism includes paraphrasing or summarizing without acknowledgment, submission of another student's work as one's own, the purchase of prepared research or completed papers or projects, and the unacknowledged use of research sources gathered by someone else; **Cheating on Examinations:** Giving or receiving unauthorized help before, during, or after an examination; **Multiple Submission:** Submitting substantial portions of the same work for credit more than once; **Sabotage:** Destroying, damaging, or stealing of another's work or working materials; **Unauthorized Collaboration:** Collaborating on projects, papers, or other academic exercises that is regarded as inappropriate by the instructor(s); **Falsification:** Misrepresenting material or fabricating information in an academic exercise or assignment; and **Bribery:** Offering or giving any article of value or service to an instructor in an attempt to receive a grade or other benefits not legitimately earned or not available to other students in the class. **Circumventing Security:** Users are prohibited from attempting to circumvent or subvert any system's security measures. Users are prohibited from using any computer program or device to intercept or decode passwords or similar access control information.

The violations listed above should be reported to the SUNY Albany University in the High School Program Office immediately. All parties involved will be directed accordingly.

Appendix C: Application/Verification Form For College Credit

NOTE: This section can be overridden by SUNY Albany – UHS's WEB Registration Application and mailed Application sent via mail according to SUNY Albany – UHS's Policy and Procedures Manual.

To be completed by the student and the secondary school teacher for the student who has met the secondary school course and/or competency requirements.

Part 1-To be filled out by student:

Student's Name _____ Program _____

Student's Address _____

City _____ Zip Code _____

Teacher's Name _____ Date _____

Course Number	Course Title	Credits
_____	_____	_____

Part 2-To be filled out by instructor:

UA New York Harbor School

Academic Grade _____ Lab Grade (if applicable) _____

Industry/Post-secondary standard(s) met? YES NO Date_____ Not applicable _____

If YES, what standard(s)? _____

Comments

_____

_____

Verified by _____

Secondary School Instructor's Signature / Date

NYHS/NYCDOE Official's Initials: ND SUNY Albany UHS Official's Initials:

Appendix D: Responsibilities

WHO	RESPONSIBILITIES
Secondary and Post-Secondary Administration	1. Complete and sign the Program/Course Articulation Agreement Form,
Secondary School Instructor	2. Identifies the course comparable to a college course, 3. Participates in Articulation Agreement development, 4. Explains the Articulated Program and various options to the student, 5. Verifies if the student has completed one or more articulated courses in the Program of Study and has achieved the necessary course competencies and performance levels, 6. Completes the *Application/Verification Form* and submits it to the college granting articulated credit by the required date *or* Informs students of the Web Registration Application due dates and Application/Registration form due dates that are mailed from SUNY Albany - UHS, 7. Inform students of fee due dates for the college courses being taken, 8. Gives a copy of the *Application/Verification Form* to the student and files a copy with the high school counselor or identified "go-to" person for the student's permanent record *or* require that student prints out two copies of Web Registration Application Confirmation Pages for student's own files and High school permanent record file, 9. Clearly advises students on all options and ramifications of withdrawing from the course and other course details,
High School Counselor or Designee	10. Notifies instructors of the Articulation Agreements and Programs, 11. Helps with students getting on board, 12. Assists instructors and students with the process by getting and supplying materials to enable and support the instructor in doing his/her part, 13. Talks with parents as needed, 14. Maintains a copy of each *Application/Verification Form* or *Web Registration Application Confirmation* page in the student's permanent file,

	15. Maintains file with all articulation agreements, 16. Sends letter to student, if required, stating terms and conditions of articulated credit award, 17. Monitor's student progress, as appropriate, to ascertain meeting criteria, 18. Collects data on all students at the school site,
High School Student	19. Notifies the appropriate person at the secondary school of his/her intent, 20. Fills out all required hard copy/web forms, including Part 1, the *Application/Verification Form* or on-line *Web Registration Application*, 21. Demonstrates course competency at the approved proficiency level, 22. Applies to the college for admittance in a timely fashion and submits transcripts along with the application, 23. Has the instructor complete Part 2 of the *Application/Verification Form* or *Web Registration Application* and submit it to the college granting articulated credit,
College Instructor/Liaison	24. Collaborates with the high school instructor on curriculum-level review,
University in the High School (UHS) Personnel	25. No additional procedures other than those already established and in practice by UHS will be required. Some of these procedures may be: 26. Notifies Registrar, if required, when credit is to be awarded,
College Registrar	27. No additional procedures other than those already established and in practice by UHS will be required. Some of these procedures may be: 28. Review and record the articulated credit on the student's transcript upon notification that all criteria have been met.

Appendix E: Program and Course Description

Introduction. The University in the High School Program offered by the State University of New York at Albany and fully articulated with the Urban Assembly New York Harbor School provides courses to students with the academic challenges of college-level curricula during their final year(s) of high school. As a "bridging" experience to college, UHS courses can help students begin to develop the skills and experience necessary for academic success in higher education. Enrollment in UHS courses may provide future opportunities to students, such as the ability to enroll in higher-level college courses or to complete a four-year degree in a shorter amount of time.

Upon successful completion of UHS course requirements, students will receive credit from the University at Albany for the courses in which they have enrolled and for which they have paid. These credits will form the basis of a permanent post-secondary academic record at the University at Albany. Credits obtained through the University at Albany may be eligible for transfer to colleges and universities throughout the country.

Specifically the Science Research Program is based on hands-on, problem-based learning strategies. Students will formulate and execute advanced research projects to address real-world problems (*e.g.* resource management, ecology, medicine, *etc*). In order to be successful students must be ambitious, be able to think outside the box, build their own knowledge base, and be able to work in a team.

Course Descriptions

A CAS 109 Intermediate Science Research (2 college credits)

Students will be introduced to research methods in the natural and social sciences by accessing scientific databases, by using on-line bibliographic search techniques, consulting doctoral-level research scholars, developing hypotheses and performing experiments to test them, and by writing research papers and making presentations at scientific symposia. It is expected that the students will have done many of these activities in the prerequisite high school course, and in this course emphasis is placed upon the formulation of hypotheses and initiation of experiments in consultation with mentors. Prerequisite(s): completion of the 10th grade Marine Biology Research class at the high-school level; permission of instructor. Offered summer session only.

A CAS 110 Intermediate Methods of Research (4 college credits)

Students will learn research methods by formulating projects in the natural and social sciences. Authentic data will be generated or accessed from on-line databases. Students will also perform exhaustive bibliographic searches, consult doctoral-level research scholars, develop hypotheses, and execute projects to test them. This course requires the submission of at least 4 research paper drafts, 3 poster board drafts, and 2 slide show presentation drafts. Students must submit their completed projects to 3 or more research fairs throughout the NYC region. It is also expected that prospective students will have done many of these activities in the prerequisite high school course, and in this course emphasis is placed upon obtaining meaningful results in consultation with mentors. Students are expected to invest at least five

(5) hours per week outside of class on their research work and must be enrolled throughout an entire academic year to obtain credit. Prerequisite: completion of the 10th grade Marine Biology Research course.

A CAS 209 Advanced Science Research (2 college credits)

Continuation of work undertaken in A CAS 109 or equivalent with emphasis placed upon the completion of experiments in consultation with mentors. Students will consult with their teachers as necessary, but will not meet in a formal classroom period. Prerequisite(s): satisfactory completion of A CAS 109 or completion of two years of an approved science research course at the high school level; permission of instructor; offered summer session only.

A CAS 210 Advanced Methods of Research (4 college credits)

Continuation of work undertaken in A CAS 110 or equivalent with emphasis placed upon the communication of results. This course requires the submission of at least 4 research paper drafts, 3 poster board drafts, and 2 power point presentation drafts. Students must submit their completed projects to 3 or more research fairs throughout the NYC region. Students are expected to spend at least three hours per week outside of class. Prerequisite(s): satisfactory completion of A CAS 110 or completion of two years of an approved science research course at the high school level; permission of instructor; students must be enrolled throughout an entire academic year to obtain credit.

Location and Meetings

A CAS 210 will meet Mondays and Wednesdays from 6th through 8th periods in room 320 unless previously warned. A CAS 110 will meet Tuesdays and Thursdays from 6th through 8th periods in room 320 unless previously warned. The class structure will be broken down into 3 components: Technical Reading and Writing, Applied Statistics, and Seminars of Project Formulation (figure 04). Every other week each student meets one on one in a conference with the instructor, where the student's progress in developing a research plan and carrying out a project is discussed and evaluated. In addition, new goals are formulated for the next session. In the seminar, students will be required to present their findings to their fellow classmates. In this environment they are critiqued on the content of their research, as well as their presentation skills. Project Formulation theory will be given during the Seminar class.

Figure 04. Class activity schedule for A CAS 110 + 210

Period	Monday	Tuesday	Wednesday	Thursday	Friday
6th	A CAS 210 Conferences/ Ind. Study	A CAS 110 Conferences/ Ind. Study	A CAS 210 Conferences/ Ind. Study	A CAS 110 Conferences/ Ind. Study	
7th	A CAS 210 Applied Statistics	A CAS 110 Applied Statistics	A CAS 210 Tech. Read + Write	A CAS 110 Tech. Read + Write	*Note: field work can override schedule.
8th	A CAS 210 Proj. Form.	A CAS 110 Proj. Form.	A CAS 210 Proj. Form.	A CAS 110 Proj. Form.	

COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK
LAMONT-DOHERTY EARTH OBSERVATORY

August 25, 2013

Mauricio Gonzalez
Marine Biology Research Program
Urban Assembly New York Harbor School
Battery Maritime Building
10 South Street
Slip 7
New York City, NY 10004

Dear Mr. Gonzalez,

I am a Research Scientist at the Lamont-Doherty Earth Observatory and the Program Director of our Secondary School Field Research Program. I have been working with the UA NY Harbor School since 2008; I sit on the school's CTE Advisory Committee, and am familiar with the CTE program generally and your Marine Biology Research Program in particular.

Since 2008 the Lamont-Doherty Earth Observatory has provided internship opportunities for Harbor School students. We have provided paid internships in the summer and unpaid, after-school positions during the school year. We have found that Harbor School students display strong interest in Earth and Environmental Science, Marine Biology, and in crossover issues between science and its social context. We expect that your Marine Biology Research Program will serve to increase the preparedness and enthusiasm of Harbor School students; we are happy to continue providing both paid and unpaid internships to your students.

Sincerely,

Dr. Robert Newton

DR. ROBERT NEWTON, RESEARCH SCIENTIST, PROGRAM DIRECTOR
P.O. BOX 1000 61 ROUTE 9W PALISADES, NEW YORK 10964-8000 USA
TEL 845-365-8686 FAX 845-365-8155 bnewton@ldeo.columbia.edu

RUTGERS
School of Public Affairs and Administration | Newark

Economic Development Research Group
Rutgers, The State University of New Jersey, Campus at Newark
111 Washington Street
Room 135
Newark, NJ 07102-1801

Dr. Deborah E. Ward
Associate Research Professor and Director
email: deward@rci.rutgers.edu
phone: 973-353-3881
cell: 917-224-2153

January 17, 2012

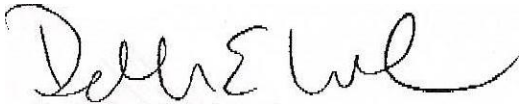
Mr. Mauricio Gonzalez
Marine Biology Research Program
Urban Assembly New York Harbor School
Battery Maritime Building
10 South Street, Slip 7
New York, NY 10004

Dear Mr. Gonzalez:

As the Director of the Economic Development Research Group (EDRG) at Rutgers University in Newark, NJ, I am pleased to provide internships to Harbor School students in support of your Marine Biology Research Program. I have worked with the NY Harbor School since 2009 and recently joined the school's CTE Professional Advisory Committee. I welcome the opportunity to partner on this project and to expand my collaboration with the Harbor School by working directly with your students.

As interns at EDRG, your students will have the opportunity to expand their research and critical writing skills as well as gain a broader knowledge about urban education. The internships will involve working with researchers on campus as well as participating in visits to Newark Public Schools sites. While after-school internships are unpaid, travel and meal allowances will be provided.

Sincerely,



Dr. Deborah E. Ward

MANHATTAN COLLEGE

BIOLOGY

January 30, 2012

Mauricio Gonzalez
Marine Biology Research Program
Urban Assembly New York Harbor School
Battery Maritime Building
10 South Street
Slip 7
New York, NY 10004

Dear Mauricio Gonzalez and UA New York Harbor School,

We are pleased to announce internship positions as *secondary-education summer research assistant* with the Biology Department, Manhattan College, 4513 Manhattan College Parkway, Riverdale, NY 10471 (www.manhattan.edu).

The qualifications for the position are:

Successful completion of ACAS 109 & ACAS 110
Ability to conduct field sampling under a range of weather conditions
Must be able to accept flexible work schedule dependent upon tidal cycles

Duties and responsibilities may include:

Maintain notebook of all observations
Data collection and entry into spreadsheets
Perform basic data calculations and graphical analyses

The period of this internship is June – August 2012. This is an unpaid position and requires 15-30 hours per week.

Sincerely,

Michael L. Judge, Ph.D.
Professor and Chairperson

4513 Manhattan College Parkway • Riverdale, NY 10471 • P: 718.862.7880 • F: 718.862.7946
michael.judge@manhattan.edu • www.manhattan.edu

ST. FRANCIS COLLEGE
THE SMALL COLLEGE OF BIG DREAMS

Department of Biology and Health Promotion

Kathleen A. Nolan, Ph.D.
Chair, Biology, Health Promotion, and
Health Care Management Dept.
718-489-5439
knolan@sfc.edu
October 21, 2013

To Whom it May Concern,

I am pleased to write a letter of recommendation for the Marine Biology Research Program's (MBRP) curriculum as molded by Mr. Mauricio Gonzalez. Mr. Gonzalez has provided the students with a rigorous academic curriculum, as well as many outside opportunities. Mr. Gonzalez has sent students to us to attend both our After-school Program that we co-host with the Brooklyn Bridge Park, and our Summer Science Academy for High School students. I have visited the school twice and found the students to be very engaged in learning. Many actively participated in discussions we held of various careers. Students in the field component tested water quality and explained what they were doing with ease. We also participated in discussions in December 2012 with other advisors on the best practices for conducting research projects with students.

Both Mr. Gonzalez and I have been involved with a program at Rutgers University in which students were able to examine and analyze sonar images of fish. Mr. Gonzalez also attended and made a presentation at the first Youth Education Seining or YES Symposium in March, 2013 at St. Francis College. I feel that the partnership that we have with the Harbor School has been invaluable to both our schools. Mr. Gonzalez, through his care and attention to detail, has really helped the students at Harbor School achieve through the Marine Biology Research Program.

Sincerely yours,

Kathleen A. Nolan, Ph.D.

Kathleen A. Nolan, Ph.D.

180 Remsen Street, Brooklyn Heights, New York 11201
(718) 489-5439 *Fax (718) 522-1274*
E-Mail: knolan@stfranciscollege.edu

Roger Williams University
Learning to Bridge the World

January 24, 2012

Mauricio Gonzalez
Marine Biology Research Program
Urban Assembly New York Harbor School
Battery Maritime Building
10 South Street, Slip 7
New York City, NY 10004

Dear Mr. Gonzalez,

It was a pleasure meeting you at the NY Harbor School Professional Advisory Committee (PAC) meeting last month, and to learn of the proposed NY State certification of the Marine Biology Research Program as a Career and Technical Education (CTE) Program.

In my capacity as a Professor of Marine Biology, I've thoroughly reviewed the scope and sequence of the proposed curriculum for the Marine Biology Research Program and can confirm that the curriculum aligns itself with the expectations of a college level course in the area of Natural Resources and Ecology. As a result, I am happy to endorse and support its use in the UA New York Harbor School's Marine Biology Research Program.

Sincerely,

Timothy M. Scott, Ph.D.
Professor of Marine Biology
Director, Center for Economic and Environmental Development

HUDSON RIVER
FOUNDATION

17 Battery Place
Suite 915
New York, NY 10004

212-HUDSONR
212-483-7667
(Fax) 212-924-8325
www.hudsonriver.org

January 20, 2012

Mauricio Gonzalez
Marine Biology Research Program
Urban Assembly New York Harbor School
Battery Maritime Building
10 South Street
Slip 7
New York, NY 10004

Dear Mr Gonzalez,

As you know, I am a project scientist at the Hudson River Foundation and I have been working with UA NY Harbor School staff and students for the last several years. This year I was asked to sit on the school's CTE Advisory Committee and have reviewed your proposed curriculum for the Marine Biology Research Program. I am writing to express my opinion that the curriculum is closely aligned with college-level coursework in Natural Resources, Ecology, and/or Field Research. I am happy to endorse the scope, sequence, and methods you have proposed for the Program.

Sincerely,

Jim Lodge
Hudson River Foundation

MANHATTAN COLLEGE

BIOLOGY

January 30, 2012

Mauricio Gonzalez
Marine Biology Research Program
Urban Assembly New York Harbor School
Battery Maritime Building
10 South Street
Slip 7
New York, NY 10004

Dear Mauricio Gonzalez and UA New York Harbor School,

I have reviewed your proposed curriculum scope and sequence for the Marine Biology Research Program currently looking for NY State certification approval as a Career and Technical Education Program. I confirm that the curriculum aligns itself with the goals of college level courses in the area of Ecology and Marine Biology. I therefore endorse and support its use in the UA New York Harbor School's Marine Biology Research Program.

Sincerely,

Michael L. Judge, Ph.D.
Professor and Chairperson

4513 Manhattan College Parkway • Riverdale, NY 10471 • P: 718.862.7880 • F: 718.862.7946
michael.judge@manhattan.edu • www.manhattan.edu

Sea Savers, Inc.

A NJ nonprofit Corporation

January 31, 2012

Mauricio Gonzalez
Marine Biology Research Program
Urban Assembly New York Harbor School
Battery Maritime Building
10 South Street
Slip 7
New York, NY 10004

Dear Mauricio Gonzalez and UA New York Harbor School,

I have reviewed your proposed curriculum scope and sequence for the Marine Biology Research Program currently looking for NY State certification approval as a Career and Technical Education Program. I confirm that the curriculum and the SPACE Certification assessment aligns with the expectations of a college level course in the area of Natural Resources, Ecology, and Geospatial Technology. I therefore endorse and support the curriculum and assessment's use its use in the UA New York Harbor School's Marine Biology Research Program.

Very truly yours,

Matthew Leahey, President
Master 100 Tons

COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK
LAMONT-DOHERTY EARTH OBSERVATORY

August 25, 2013

Mauricio Gonzalez
Marine Biology Research Program
Urban Assembly New York Harbor School
Battery Maritime Building
10 South Street
Slip 7
New York City, NY 10004

Dear Mr. Gonzalez,

I am a Research Scientist at the Lamont-Doherty Earth Observatory and the Program Director of our Secondary School Field Research Program. I have been working with the UA NY Harbor School since about 2007; I sit on the school's CTE Advisory Committee, and am familiar with the CTE program generally and your Marine Biology Research Program in particular. I have reviewed your scope and sequence, and have also worked closely with several of your students over the past couple of years. I am writing to confirm that the curriculum is closely aligned with college-level coursework in Natural Resources, Ecology, and/or Field Research. I am happy to endorse the scope, sequencing, and methods you have proposed for the Program.

Sincerely,

Bob Newton

Dr. Robert Newton

DR. ROBERT NEWTON, RESEARCH SCIENTIST, PROGRAM DIRECTOR
P.O. BOX 1000 61 ROUTE 9W PALISADES, NEW YORK 10964-8000 USA
TEL 845-365-8686 FAX 845-365-8155 bnewton@ldeo.columbia.edu

a xylem brand

11.13.11

Mauricio Gonzalez
Marine Biology Research Program
Urban Assembly New York Harbor School
Battery Maritime Building
10 South Street
Slip 7
New York, NY 10004

Dear Mauricio Gonzalez and UA New York Harbor School,

I have reviewed your proposed curriculum scope and sequence for the Marine Biology Research Program currently looking for NY State certification approval as a Career and Technical Education Program. I confirm that the curriculum aligns itself with the expectations of a college level course in the area of Natural Resources and Ecology. I therefore endorse and support its use in the UA New York Harbor School's Marine Biology Research Program.

Sincerely,

Barrett Gaylord
YSI, Inc.
Northeast Representative

AN URBAN ASSEMBLY SCHOOL
New York HARBOR SCHOOL

Science Research Project Conference Report

Bring a copy of the relevant Checkpoint List and your Project Data Book to all conferences.

Name _____ Date _____ Time _____

To Be Completed Before the Conference

*** Put post-it notes on the relevant portions of your Project Data Book.**
*** Be prepared to explain or answer questions about this work.**

1. ***Evidence that you have completed each of the tasks assigned during the last conference.**

2. ***List additional completed tasks beyond those assigned. Provide evidence that you have completed these additional tasks.**

3. ***Which items on the Checkpoint List do you feel you have accomplished?**

4. **What problems did you encounter with completing the assigned tasks? How did you seek solutions to these problems?**

5. **What problems do you still need help with? What questions do you have?**

6. **What would you like to discuss during this conference?**

7. **What tasks do you feel would be the most appropriate next steps to be accomplished before the next meeting?**

AN URBAN ASSEMBLY SCHOOL
New York HARBOR SCHOOL

Science Research Project Conference Report

To Be Completed During Conference

1. What advice or feedback did you receive during this conference?

2. What tasks do you plan on completing before the next conference?

Preparation for conference: __Excellent __Good __Average __Poor __Unacceptable

Participation in conference: __Excellent __Good __Average __Poor __Unacceptable

_____ _____

Student signature Teacher signature

Next conference date _____day _____ time _____

AN URBAN ASSEMBLY SCHOOL
New York HARBOR SCHOOL

BIWEEKLY ASSESSMENT OF STUDENT PERFORMANCE

STUDENT NAME:_____DATE:_____

"One of the best lessons that anyone can learn in life is how to use time wisely." William A. Irwin

"If there is no struggle, there is no progress." Frederick Douglas

SCORING KEY:
A = to an outstanding level (numerical value is 95)
B = to an adequate level (numerical level is 85)
C = to a less than adequate level (numerical value is 75)
D = to a dismal level (numerical value is 65)
F = not at all (numerical value is 0)
NA = not applicable to this assessment

+ and – may also be used to show the student's achievement level

During this cycle did the student:

1. do an appropriate amount of bibliographic research for articles and/or information and/or people, which is supported by documentation?

A B C D F NA

2. achieve appropriate advancements in the journal readings (i.e. progress from general to professional journal articles, or is reading more of the required types) that are clearly and sufficiently summarized?

A B C D F NA

3. demonstrate mature, scholarly, and exemplary attitudes and behaviors in and towards the research class (this includes personal neatness/organization and respect fro everyone and everything associated with the program)?

A B C D F NA

4. use time effectively; both in and out of class, demonstrating a clear focus on his/her research and/or other SR related work?

A B C D F NA

5. give a PowerPoint or poster presentation, write a paper or complete some other SR assignment in a professional manner with improved skills demonstrated?

A B C D F NA

AN URBAN ASSEMBLY SCHOOL
New York HARBOR SCHOOL

6. keep track of their research progress by documentation in their laboratory notebook and by keeping their portfolio current and updated, neatly organized with professionally completed records?

A B C D F NA

7. communicate with their mentor(s), or other professionals in a timely, responsible, and professional manner, with proper documentation?

A B C D F NA

8. meet established deadlines in a professional manner (i.e. assessments, goals, committee work, competition entries, PowerPoint presentations, posters, etc.)?

A B C D F NA

9. demonstrate independence, self-motivation, professionalism, timeliness and enthusiasm to further the progress of their research endeavor?

A B C D F NA

Failure to make an assessment is an automatic zero, with the exception of a legal absence. If an assessment is missed with a legal excuse, it is the student's responsibility to reschedule with the instructor.

It is the student's responsibility to reschedule with the instructor immediately upon the student's return. Failure to reschedule in a timely manner will be reflected in the assessment grade.

If an assessment must be rescheduled due to circumstances that the student could not foresee or control the student must reschedule at the very least 24 hours in advance. Last minute changes will be treated accordingly.

Overall Student Assessment: _____ Date:_____

_____ _____

Student's Signature **Teacher's Signature**

Modifications for Students with Special Needs

11. List modifications to the program to accommodate students with special needs.

Common Student Needs	Modifications
Extra time	Tutorial sessions will be scheduled
Small group instruction	Rosters will not exceed 20 students per class; detailed progress reports will be given; one-on-one meetings to go over progress reports will be scheduled on a biweekly basis
Test anxiety	Grades will be based primarily on alternative assessments such as written reports, lab work, presentation skills, interviews, etc.
Planning	Students will be required to create and update chronograms of project activities quaterly.
Home support	Parents will be required to sign a contract together with the research student promising to lend support at home. Mandatory parent meetings will be held to present program requirements.
Lack of materials	Students will be provided with some basic research materials such as lab notebooks and lab gear.
Mentors	Students will be required to search for mentors outside the program to help them with the completion of their projects.
English Language Learners	Materials will be translated to other languages

Curriculum Review

Industry or postsecondary partners must review course curriculum and attest to its alignment with industry expectations for skilled workers.

12. List the partner organizations who have signed letters of support, validating their approval of the program's content.

#	Partner Organization	Representative	Date
1	Lamont-Doherty Earth Observatory	Dr. Robert Newton	04.14.2012
2	Roger Williams University	Dr. Timothy Scott	01.24.2012
3	Yellow Springs Instruments	Mr. Barrett Gaylord	11.13.2011
4	Manhattan College	Dr. Michael Judge	01.30.2012
5	NYC Department of Education	Mr. James Hall	01.18.2012
6	Sea Savers Inc.	Mr. Matt Leahey	01.31.2012
7	Hudson River Foundation	Mr. Jim Lodge	01.20.2012
8			

End-of-Program Examination

13. Identify the end-of program examination.
The end of year evaluation will take various forms:
01) research report, 02) journal style article, 03) research portfolio, 04) project defense at science fair, 05) NOCTI exam on natural resource management, and 06) GIS SPACE certification exam.

14. How will the program prepare students for the end-of-program examination?
The Marine Biology Research Program will prepare students for the different forms of evaluation by:
    01) Research Report – Students will receive step-by-step guidance to complete a research project and communicate the various stages of this work orally and written throughout the three years of the program's duration,
    02) Journal style article – Students will learn technical reading and writing skills and the American Psychological Association style throughout the 3 years in the program to format a journal article of their research,
    03) Research portfolio – Students will be required to keep a portfolio of their research progress and exemplary work including drafts and literature summaries which will be evaluated 3 times during the academic year,
    04) Project defense – Students will be required to present their research work at various stages of development in order to gain the confidence required to present their project results in front of a professional audience,
    05) NOCTI exam – Students will be required to complete theory workshops, field work, and lab work that will convey the information required for the NOCTI exam on resource management,
    06) GIS SPACE certification – Students will be required to complete theory workshops, field work, and lab work that will convey the information required for the SPACE GIS STEM certification.

Postsecondary Pathways

15. How will the program prepare students for postsecondary pathways in education or industry?
The failure of our urban public schools to produce scientifically literate college bound teenagers reflecting city demographics is well known. Equally disturbing is the lack of representation and participation in STEM (Science, Technology, Engineering and Math) of ethnic groups who are over-represented below the poverty line. Our nations research institutions and private engineering firms increasingly look outside our borders to recruit and hire competent scientists. This program will focus on changing these trends and connect our youth to the skills and knowledge necessary to be competitive in college and enter the STEM fields. The vehicle for this transformation will be student-formulated, problem-based projects that aim to restore NYC's marine resources.
The Marine Biology Research Program is a 3 yr. program that will jump start high school students in core marine science topics employing hands-on, problem-based learning strategies. Students will begin by building and studying simple aquatic ecosystems; formulate experiments with these

systems; learn the biology, chemistry, physics, and ecology behind them; and apply basic instrumentation techniques to monitor them. Once these sets of “in house” skills have been mastered, the program will then shift students’ attention to the natural ecosystems around Governor’s Island through the formulation of projects around 3 main topics: oyster restoration, habitat characterization, and water quality monitoring with a student built and maintained network around the Hudson River Estuary. Students will learn how to formulate projects, submit professional reports, present at national and international research fairs (e.g. Intel Talent Search), and, ultimately, use their own data to propose resource management solutions to local government agencies. Upon satisfactory completion of this program students will also be eligible for 12 college credits and various certifications that will give them a competitive advantage when applying to college.

Work-Based Learning

16. To demonstrate alignment between classroom-based instruction and internship activities, list all work-based learning activities by course.

Grade	Term	Course	Knowledge	Skills	WBL Internships	Partner Organizations
9	Fall					
	Spring					
10	Fall	Introductory Marine Research I	Instrumentation; Invertebrate zoology Vertebrate zoology; Algae; Aquatic Biology, Chemistry, Physics, and Ecology	Designing, building, and maintaining model ecosystems; basic computing and search engine skills; ecological principles;	Professional visits from higher education	Manhattan College, Rutgers University, Columbia University, Dept. of Environmental Protection, Sea Savers Inc., Hudson River Foundation
	Spring	Introductory Marine Research II	Marine Biomes, population, community, and ecosystem ecology. Evolution.	Lab technology skills (i.e. dissection, bacteria culture, microphotography, cell staining,	Visits to industry and higher education events such as Open Houses, Science Society meetings, regional science fairs, etc.	New York Marine Sciences Consortium, New York City Science and Engineering Fair, Manhattan College, Rutgers University, Columbia University, Dept. of Environmental Protection, Sea Savers Inc., Hudson River Foundation
11	Fall	Intermediate Marine Research I	Project Management, Instrumentation	Technical reading and writing	Lab work at localities of higher education and industry with professional mentors. Presentations to industry and higher education events such as Open Houses, Science Society meetings, regional science fairs, etc.	Manhattan College, Rutgers University, Columbia University, Dept. of Environmental Protection, Sea Savers Inc., Hudson River Foundation, Stevens Institute of Technology, Roger Williams University
	Spring	Intermediate Marine Research II	Project Management, Instrumentation, data processing	Applied statistics and statistics software (*i.e.* R); project formulation, execution, and presentation;	Professional research directed by Industry/College professionals	Manhattan College, Rutgers University, Columbia University, Dept. of Environmental Protection, Sea Savers Inc., Hudson River Foundation, Stevens Institute of Technology, Roger Williams University
12	Fall	Advanced Marine Research I	Project Management, Instrumentation	Benthos sampling techniques	Professional research directed by Industry/College professionals	Manhattan College, Rutgers University, Columbia University, Dept. of Environmental Protection, Sea Savers Inc., Hudson River Foundation, Stevens Institute of Technology, Roger Williams University

	Spring	Advanced Marine Research II	Project Management, Instrumentation	Research conservation strategies and advocacy; Running and maintaining high tech physical-chemical data retrieval devices and telemetry.	Professional research directed by Industry/College professionals	Manhattan College, Rutgers University, Columbia University, Dept. of Environmental Protection, Sea Savers Inc., Hudson River Foundation, Stevens Institute of Technology, Roger Williams University

Work-Based Learning Coordinator

17. The work based learning coordinator is state-certified.

Coordinator: _____ Date of WBL Coordinator Certification: _____

Non-Internship, Work-Based Learning Activities

Work-based learning activities, other than internships, should be offered to students so that they can explore career options and develop job-readiness skills.

18. List all non-internship, work-based learning activities offered in each grade.

Grade	Term	WBL Activities
9	Fall	
	Spring	
10	Fall	Students will be exposed to professional role models from various higher education institutions and industry related to resource management that will visit the high school as guest lecturers. Students will be exposed to different career options in the sciences through career and college fairs. Students will be exposed to state-of-the-art technologies used in today's ever advancing world in the program.
	Spring	Students will visit the various higher education institutions and industry related to resource management to get a sense of the professional work environment. Students will visit regional science fairs to get a sense of exemplary academic work being done in the POS. Students will be exposed to different career options in the Sciences by going to conferences related to resource management.
11	Summer	Students will be given the opportunity to participate in a WBL internship at a post secondary Institution or Industry partner.
	Fall	Student will seek and find professional mentors to help them complete their long-term research projects; participate in open houses, conferences, and career fairs; be exposed to state-of-the-art technologies.
	Spring	Student will seek and find professional mentors to help them complete their long-term research projects; shadow mentors for work experience; be required to prepare a resume and update it accordingly.

12	Summer	Students will be given the opportunity to participate in a WBL internship at a post secondary Institution or Industry partner;
	Fall	Students will punch in and out of class; keep track of a check off list with tasks for the day, week, and month; fill out forms related to college and internship requirement; include a service learning component in their projects; and present project results in front of a panel of peers;
	Spring	Students will receive classes on tips and pointers of work ethic and other soft skills like punctuality, communication, and personal presentation. Students who have not taken the previous summer opportunities to be a part of an internship will be required to participate in one at a post secondary Institution or Industry partner.

WBL Advising

All students must be informed of the following aspects of work-based learning internships:

1. Participation requirements
2. Opportunities to learn about and apply for WBL internships
3. Orientation trainings
4. Work tasks and expectations
5. Performance evaluations

19. How will students be informed of aspects of the WBL internship program?

Participation Requirements: Special workshops during class hours will be held to inform students of the requisite of participating in an internship in order to receive CTE certification.
These requisites will also be announced in flyers and brochures along with letters sent home.

Internship Opportunities: There will be an internship open house held by the school and the instructor will also announce internship opportunities as they develop and become available throughout the year.

Orientation Trainings: Students will be trained on professional soft skills

Work Tasks and Expectations: A list of skills obtained in the program will be made available to Internship sites who will check-off the specifics required for their program. Internship sites will also generate a list of expectations. Both lists will be made available to the student who will apply.

Performance Evaluations: Students will be given a rubric based on the skills mentioned above before they begin work that will be used to evaluate their performance by the high school program director and the internship site director.

Site Visits Evaluations

The WBL Coordinator is responsible for conducting site visits to evaluate student progress, observe the work site, and monitor the host employer. Create standardized rubrics to use for each evaluation.

[ ] Rubric to evaluate student progress
[ ] Rubric to evaluate work site
[ ] Rubric to evaluate host employer

Host Employers

In consultation with host employers, the school should develop materials to support host employers.

[ ] Create a training plan for students
[ ] Develop a guidance packet about working with student interns
[ ] Organize an orientation session for host employers
[ ] Create an evaluation rubric of student performance for host employers

Culminating Internship Project

All students should complete a culminating internship project or other evaluation mechanism to assess student internship experiences.

20. Describe the culminating internship project.
    01) Internship project themes will be site specific or a continuation of the long term project the student is working on as part of their regular CTE course.
    02) Internship projects will require the following items:
        a. formulation of a problem,
        b. literature review and submission of journal article summaries,
        c. project design formulation,
        d. acquisition of quantitative and qualitative data,
        e. data analysis,
        f. submission of a written report,
        g. presentation of results to an appropriate audience (i.e. science fairs, student body, community organizations, etc.)
    03) Contingency plan for passing project along to another student.

Internship Modifications for Students with Special Needs

21. List modifications to the internship to accommodate students with special needs.

Common Student Needs	Modifications
Filling out applications	Help will be provided on a case by case basis by program director during soft skills workshops.
Social and interpersonal skills for interview	Help will be provided on a case by case basis by program director during soft skills workshops.
Understanding Job skills + articulating own attributes	Help will be provided on a case by case basis by program director during soft skills workshops.
Communicating effectively with co-workers and/or clients	Help will be provided on a case by case basis by program director during soft skills workshops.
Managing time	Create a daily or weekly schedule or chronogram
Keeping track of tasks	Write tasks on notepad and prioritize
Punctuality	Help will be provided on a case by case basis

Communication with Host Employers

Formal channels of communications must be in place for the host employer to collaborate with or give feedback to the school on the WBL activities.

22. Describe the formal channels of communication.
    01) Letters of articulation will be generated by the CTE program and signed by all participating parties.
    02) A point of contact person will be identified in the host employer organization.
    03) E-mails will be the main avenue of communication.
    04) Forms for evaluations of student progress will be provided to employer.
    05) List of personalized student skills will be provided to host employer.
    06) Routine visit to employer by program director will be scheduled to review worksite conditions.
    07) An orientation session will be set up for host employers and prospective interns.
    08) End of program surveys will be distributed to host employers on-line to evaluate the program overall.

Measuring Effectiveness

Both CTE-specific and school wide data must be used to determine program effectiveness.

24. Describe the metrics used to determine program effectiveness.
Students can summarize journal articles and write a literature review report using APA style.

Students can design a research project and write a research plan

Students can obtain data in the field or lab

Students can support results using statistical analyses

Students can present results in a written report, slide show presentation, and/or poster board session

Students can pass the end-of-program content specific exams

Students can use their work products to successfully interview and apply for college.

Students can be accepted to present at the New York City Science and Engineering Fair and the International Science and Engineering Fair.

Students can receive at least 2 college credits

Students can pass the SPACE examination for certification in Geographic Information Systems

Assigning CIP Codes

All CTE programs in New York are assigned CIP codes as well as students participating in those programs.

[ ] Verify all courses with the program sequence were assigned CIP codes in HSST/STARS.
[ ] Verify all students participating in the program were assigned CIP codes in HSST/STARS.

Assessments

27. Identify the formative and summative assessments used in each course.

Grade	Term	Course	Formative Assessments	Summative Assessments
9	Fall			
	Spring			
10	Fall	Introductory Marine Research I	Literature Review summaries, lab journal evaluations; portfolio evaluations; theory written quizzes; verbal quizzes;	lab reports
	Spring	Introductory Marine Research II	Literature Review summaries, lab journal evaluations; portfolio evaluations; ecology lab challenges	Final presentation on Journal article at science fair
11	Fall	Intermediate Marine Research I	Draft research papers; draft project presentations; project formulation benchmarks submitted (*e.g.* chronograms, literature review summaries, sampling schedules, etc.); ecology lab challenges	Final research paper
	Spring	Intermediate Marine Research II	Project formulation benchmarks submitted (*e.g.* chronograms, literature review summaries, sampling schedules, etc.); GIS lab challenges	Final project slide show presentation at science fair
12	Fall	Advanced Marine Research I	GIS lab challenges	Final research paper;
	Spring	Advanced Marine Research II	GIS project challenges	Final project slide show presentation at science fair; Internship project presentation; NOCTI exam; SPACE GIS exam

Industry-Approved Technical Assessments

An industry-approved technical assessment must be used to test student knowledge and technical skills at the end of the program. The exam must include written, performance-based, and project-based components.

28. Identify the industry-approved technical assessment used at the end of the program.

Assessment: Natural Resources Systems

Organization: NOCTI

Industry-Recognized Certification

Students who successfully pass the technical assessment must receive an industry-recognized certification, license, or credential.

29. Identify the industry-recognized certification awarded at the end of the program.

Certification: SPACE STEM

Organization: Digital Quest

Alternative Testing Strategies for Students with Special Needs

30. List modifications to testing used to accommodate students with special needs.

Common Student Needs	Modifications
Regulated Time	Extended Time
Student self reads exam	Exam read to student
Regular print	Enlarged print
Exam in English	Student uses dictionary and list of key words that are translated

Meetings with Partner Organizations

The school and its external partners meet annually or frequently to discuss and update the curriculum content based on industry trends and expectations.

#	Date	Meeting Topic	Participants
1	03.16.11	PAC meeting, internships, projects, agency contacts	Carter Craft, Don Chesley, Nina Zaine
2	06.03.11	Water quality, plankton (Mike Lavandowsky) Castle Point buoy coordinates	Don Chesley
3	07.06.11	Projects, water sampling, materials (Niskin Bottles)	Bob Newton
4	11.11.11	Specific lessons on calibration and repeatability issues with instruments. Calibrating a flow meter. Captain's license.	Matt Leahey, Philip Orton, and Don Chesley
5	12.14.11	PAC Meeting.	Matt Leahey, Mike Judge, Bob Newton, Tim Scott, Jim Hall, Jim Lodge, Barrett Gaylord, Deborah Ward, Beau Ranheim, Carter Craft, Philip Orton,
6	01.10.12	GIS curriculum edits and suggestions (sent over mail).	Jim Hall
7	01.24.12	Nutrient and Bacteria Sampling	Bob Newton, Kali McKee
8	03.15.12	Oyster Restoration, Econcrete, Water quality transects	Matt Leahey + Philip Orton
9	12.05.12	PAC meeting, internships, projects, agency contacts	Matt Leahey, Mike Judge, Tim Scott, Jim Hall, Jim Lodge, Ido Sella, Shimrit Perkol-Finkel, Bart Chezar, Thomas Lunke, Kathy Nolan,
10	02.10.13	Plastic vs. Plankton Project + Coast Guard training	Matt Leahey
11	02.20.13	Hudson River water quality monitoring network HRECOS	Philip Orton
12	04.05.13	Post Sandy and potential student research	Philip Orton
13	11.23.13	GIS equipment and resource start-up advice, internship possibilities, etc.	Jim Hall

Professional Visits to school

The school and its external partners meet frequently to present to the students as part of the WBL experience.

#	Date	Meeting Topic	Participants
1	12/20/2012	Measurement limitations.	Matt Leahey, Sea Savers Inc.
2	01/24/2012	Enterolert and Spectrophotometer training	Dr. Robert Newton, Columbia U.
3	02/10/2012	Econcrete method for increased larval recruitment in HRE.	Dr. Shimrit Perkol-Finkel, SeaArc Inc.
4	02/16/2012	Oyster Restoration and Education	Murray Fisher, NY Harbor Foundation
5	02/27/2012	Osprey Platforms	Bart Chezar,
6	04/24/2012	Using Radar to detect bird migration in NYC.	Dr. Alan Clark, Rutgers U.
7	03/06/2013	Econcrete – Benthic Invertebrate Sampling	Dr. Shimrit Perkol-Finkel, SeaArc Inc.
8	03/14/2013	Using Primer and Permanova for ecological statistics analysis	Dr. Shimrit Perkol-Finkel, SeaArc Inc.
9	04/04/2013	Water Pollution and water resources (school professional visit)	Matt Leahey and Coast Guard Auxiliary
10	04/10/2013	Marine Research and College Preparedness (professional school visit)	Mike Judge, Manhattan College
11	10/03/2013	Careers in STEM	Con Edison Team
12	10/23/2013	Careers and advantages in GIS	Jim Hall, DOE GIS Analyst

Conferences, College Open houses, Work Fairs

The school and its external partners meet annually or frequently to discuss and update the curriculum content based on industry trends and expectations.

#	Date	Meeting Topic	Participants
1	10/01/2011	Lamont-Doherty Open House	Columbia university
2	11/19/2011	Conference on Fish around HRE	College of St. Francis
3	02/29/2012	NYHS Internship Fair	Various
4	03/04/2012	High School Science and Engineering Fair	NYCSEF
5	04/27/2012	Sharks Conference	Kingsborough Community College
6	10/18/2012	40th Anniversary Clean Water Act	EPA
7	11/07/2012	Green Careers Fair	The Nature Conservancy
8	03/01-02/2013	Virtual Lab training	Black Rock Forest
9	03/10/13	Open House	American Museum of Natural History
10	03/15/2013	Seining in the HRE	St. Francis College
11	04/20-21/2013	Mammalian resource management	Black Rock Forest
12	04/25/2013	Water/Energy Nexus	ConEd
13	11/05/2013	2nd Annual STEM Career Day	Department of Education - Office of School Programs and Partnerships. Students
14	11/09/2013	2013 LEAF Green College and Career Fair	The Nature Conservancy

Articulation Agreements

Schools should create articulation agreements with a post-secondary institution that offers students a smooth transition from high school to advanced study. A copy is available for submission.

Institution	Terms of Agreement	Value-Added Benefit (e.g., college credit, waived tuition)	Date
SUNY Albany	See attached Articulation Agreement.	College Credit	
Manhattan College	See attached Articulation Agreement.	College Credit	
Roger Williams University	See attached Articulation Agreement.	College Credit	

Roles of Institutions

The school and the postsecondary institution have respective roles to clarify and carry out terms of student eligibility and processes so that qualified students may attain articulation agreements.

Institution	Institution's Roles	Harbor's Roles
SUNY Albany	See attached articulation agreements.	
Roger Williams University	See attached articulation agreements.	
Manhattan College	See attached articulation agreements.	

Record of Professional Development

The school and its external partners have engaged the instructors in professional development.

#	Date	Conference Topic	Sponsoring Organization
1	11/07/2011	University in the High School professional development	SUNY Albany
2	11/19/2011	Science Expo with topics in heavy metals.	St. Francis College
3	01/30/2012	Data driven instruction	NOAA
4	06/14 – 06/19/12	OSHA training	UFT – National Labor College
5	06/28/12	Sea level rise – Surface Elevation Tables	Lamont-Doherty Earth Observatory
6	03/01-02/2013	Virtual Lab training	Black Rock Forest
7	03/14/2013	Using Primer and Permanova for ecological statistics analysis	Dr. Shimrit Perkol-Finkel, SeaArc Inc.
8	04/09/2013	MWA 2013 Waterfront Conference	Metropolitan Waterfront Alliance
9	04/16/13	Running a Citizen Science Program – Writing a Quality Assurance Project Plan	EPA
10	11/02/13	Genetic Barcoding	Cold Spring Harbor – Urban Barcode Project

Validating Technical Assessment

Industry partners/experts must validate that the technical assessment is an appropriate instrument to evaluate student mastery of skills and competencies in the given CTE industry area. Letters of support should be available.

31. List the partner organizations who have signed letters of support, validating their approval of the program's technical assessment.

#	Partner Organization	Representative	Date
1	Jim Lodge	Hudson River Foundation	04.09.2012
2	Matt Leahey	Sea Savers Inc.	04.11.2012
3	Barrett Gaylord	YSI Inc.	04.09.2012
4	Philip Orton	Stevens Institute	04.12.2012
5	Charlie Fitzpatrick	ESRI	04.24.2012
6	Craig Harvey	EIGS	11.28.2011

The school and its industry and postsecondary partners have a process to confirm annually that the technical assessment is a valid instrument to use to test students completing the CTE program.

32. Describe the process to confirm test validity.

Test data will be made available to PAC members yearly to determine the success of the evaluation. Data will be broken up into the following categories:

01) Percentage that sat for exam from total in roster
02) Percentage that passed the exam from those that sat for it
03) Attendance percentage and pass percentage
04) Percentage of questions successfully answered by topic

PAC members and CTE staff will determine if the test needs to be modified completely or in part.