

# Unit III: Project Management

Mr. M. González

Marine Biologist

# Do Now

- Recall the scientific method stick.
- Make a list of the order with which you logically figured out how it works.
- What came to your mind as the strings were pulled?

What are research projects?

# What you experienced...

- ...is called curiosity
- ...is a problem
- ...is something to be solved
- ...*is the birth of science*

What are research projects?

# H.W.

- AEM draft due first day of next school week.
  - All chapters of a lab report need to be included.
- Print 6 general articles on the internet related to your topic
  - Due in two days

The background of the slide features a dark blue field with several sets of concentric circles in a lighter blue shade. These circles are arranged in a way that they overlap, creating a complex, web-like pattern that fills the entire background.

# What are research projects?

Mr. Mauricio Gonzalez

What are research projects?

# Objective

- I can distinguish between the different types of research projects.

What are research projects?

# Have you ever worked on a project?

- If you have you've done *research*.
- In research you explain things.
- These “things” are called “problems” or **scientific problems**.



What are research projects?

# Have you ever worked on a project?

- Apply facts and skills you've learned from all academic subjects and *common sense*.
- Often research uses the **Scientific Method**.
- In this class you will create a research project.





# How is a project completed?

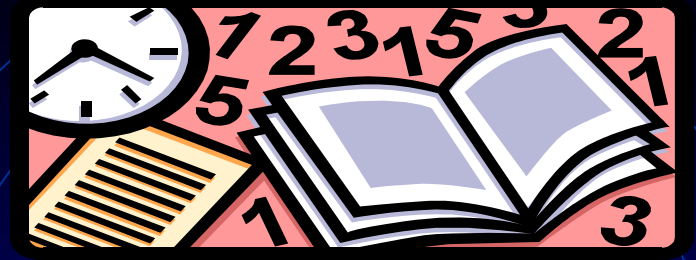
## Project Overview:

01. Formulate or create a project (outline)
02. Perform project (record data & repeat)
03. Write research paper (analyze + compare)
04. Prepare and present project to others



What are research projects?

# Due Dates?



- Make sure to keep due dates.
- Become familiar with the **master chronogram**



## Marine Biology/Science Research Chronogram

Figure 05a. Detailed chronogram of major due dates – 10<sup>th</sup> 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	X	X	X	X	X	X	X	X	X	X	X	X	X
Choose Topic	>X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6 General Articles	>X	X	X	X	X	X	X	X											
1 PRJ Article		X	X	X	X	X	X												
Article Summary					X	X	X	X	X	X									
1 <sup>st</sup> Draft Slide Show							X												
2 <sup>nd</sup> Draft Slide Show								X											
1 <sup>st</sup> Draft Poster Board										X									
2 <sup>nd</sup> Draft Poster Board												X							
Final Presentation															X				
3 Design Matrices																X	X	X	

What are research projects?

# What are the different types of research projects?

1. **Experiments** (use controls + replicates)
2. **Observational** (no controls but replicates yes)
3. **Design** (engineering / software)
4. **Secondary research**



What are research projects?

# 01 . What is an experiment?

- In an experiment you attempt to test a hypothesis.
- **Control** as many **variables** as possible
- Change only one **variable** at a time to see if it is the cause of change.

# 01 . What is an experiment?

- What is the best solid substrate to use for germinating and growing chive seeds?



What are research projects?

## 02 . What is an observational project?

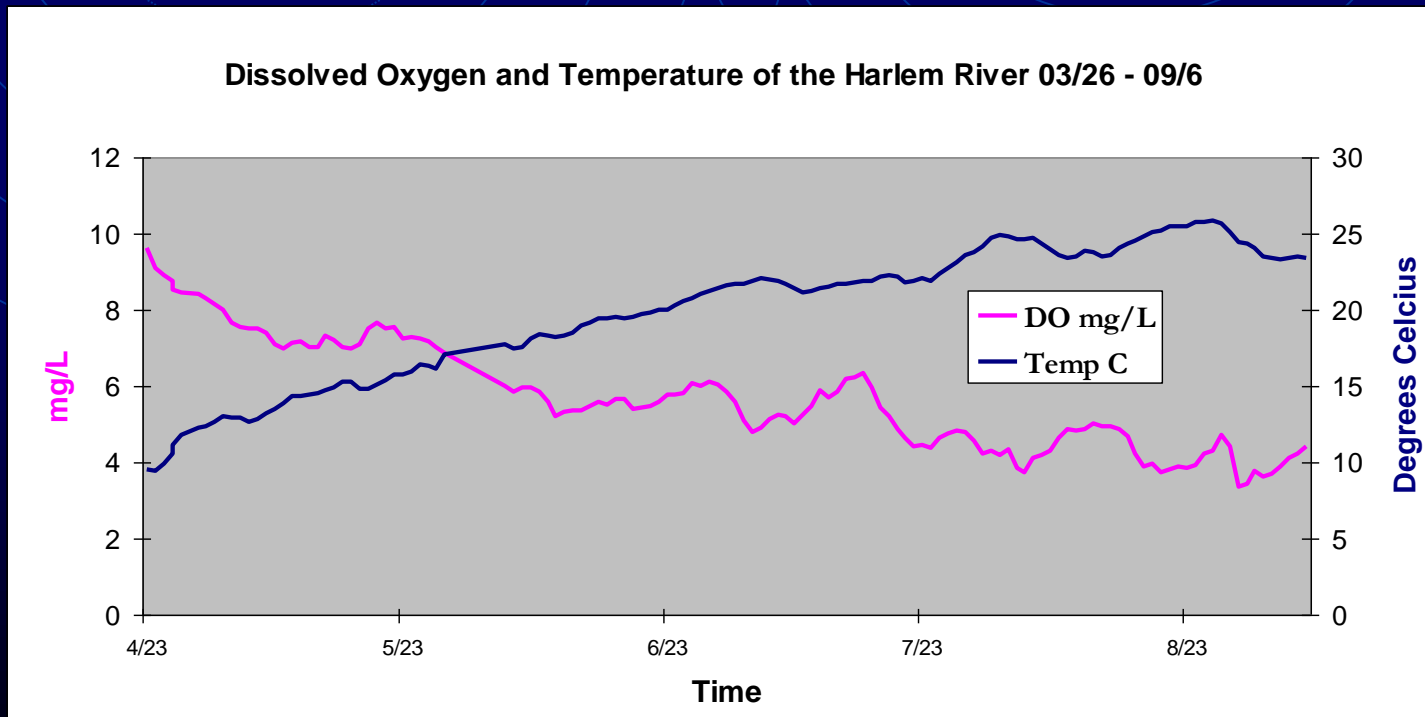
- Field work projects are often observational
- Cannot control variables in environment
- Data of many different variables are obtained
- Purpose is to try to find patterns



What are research projects?

## 02 . What is an observational project?

- For example, how are water oxygen levels and water temperature related in the Harlem River throughout the year?





# Combining Lab and Field Work

Example: Compare the DNA of aquatic organisms found in different NYC parks (*e.g.* Central Park, Highbridge Park, Prospect Park, NYBG), *etc.*

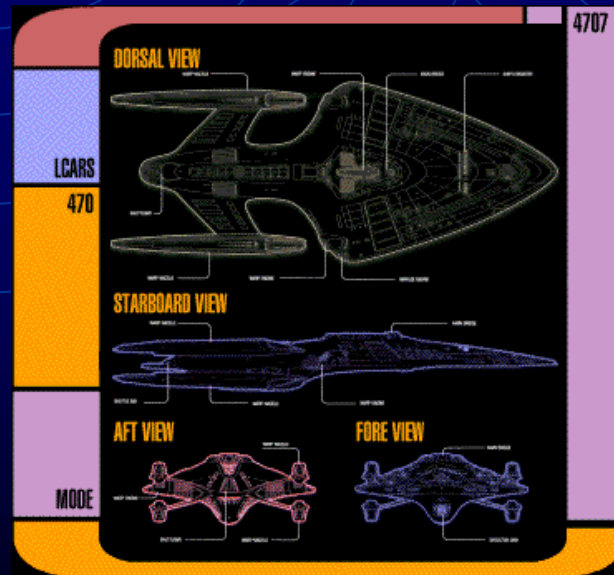


What are research projects?

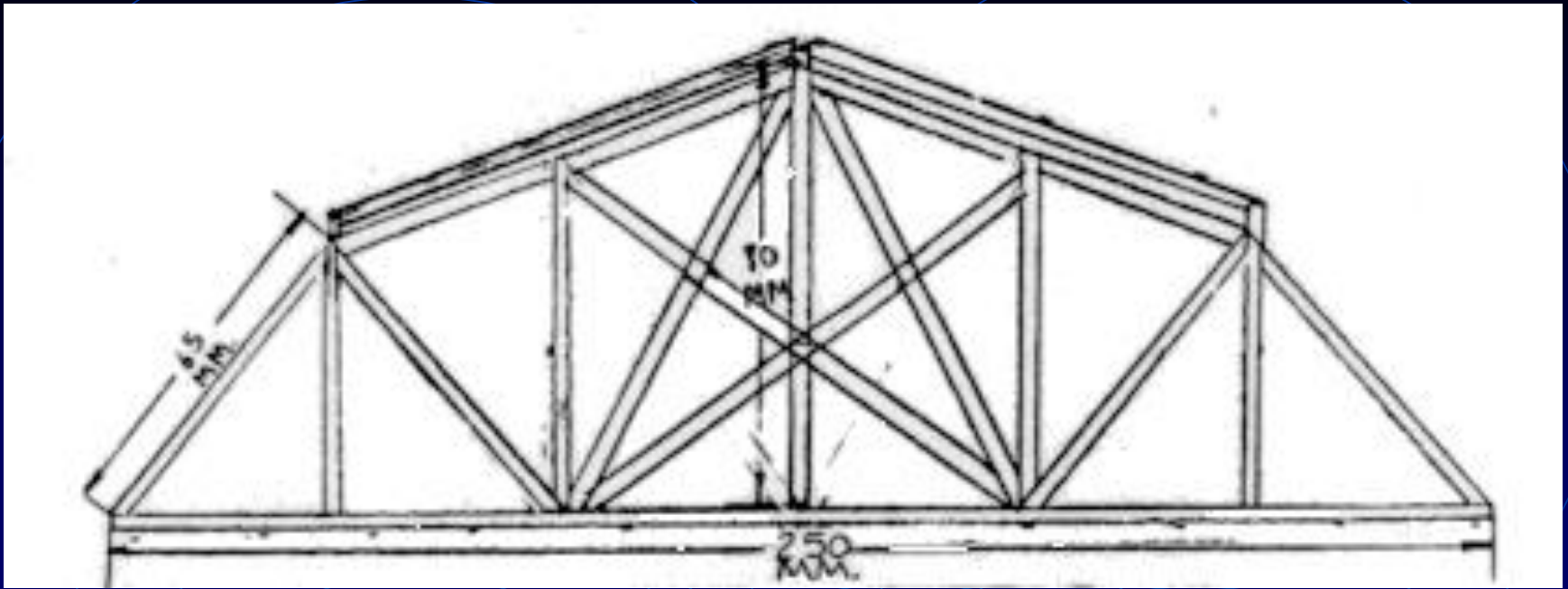


# 03 . What is a design project?

- Create a plan for a model and build a prototype of an object which you have improved or invented.
- Or design software



What are research projects?



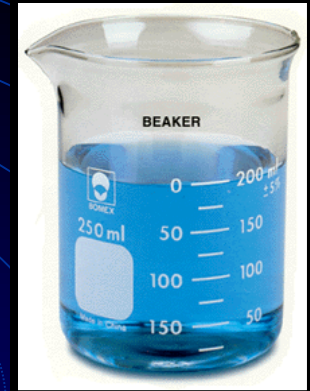
## Design a bridge

Is this blue print a plan to build an actual bridge or a prototype?

What are research projects?

# Research Tools

- There are many types of tools.
- Tools help you set up your project and collect valuable data.



## 04 . What is a secondary research project?

- Report on information that has been thoroughly studied by scientists
- You run out of time to acquire your own data
- Can't observe yourself for technical reasons (*i.e.* electron microscope, black holes) or because too dangerous (*i.e.* Ebola virus, volcanoes).

# Review Research Chronogram



## Marine Biology/Science Research Chronogram

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What are research projects?

# MBRP Research STEPS

- 10<sup>th</sup> Grade into Summer of 11<sup>th</sup> Grade
  - STEP 01 – Choose a topic
  - STEP 02 – Literature Review Management
  - STEP 03 – Literature Review (Article Summaries)
- 11<sup>th</sup> Grade
  - STEP 04 – Project Formulation
  - Continued...

What are research projects?



# Step 1 - Topics

- Define interest
- Pick 3 topics
- Describe why they interest you
- List key words about topic
- Scan key words on internet or book
- Read at least 2 sources for each topic
- Only trust .org, .gov, and .edu sites

# Check Step 01 Key Words

I. Explain your research area of interest and why you want to pursue it?

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II. Make lists of key words by topic and read more about them by using a search engine (*i.e.* google).

CO2	Sources
Indoor	Outdoor
Levels	Danger
	Classroom
	Natural symptoms

III. After reading about your most interesting topic write down specific questions that come to your mind.

1. 

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2. 

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- Fill out key word box on the back of Step 01.
- These words will be important next.

How do I search for journal articles and keep a chronogram?



# Step 01 - Questions

- Develop questions about the your most interesting topic using your key words.
- Make sure your questions are not unrealistic, too specific, or too easy.
- Look for experienced people who can help you with your topic and discuss your questions.
- Make sure you know whether your questions have already been studied.
- Refine your questions as necessary.

# Steps 02 + 03

- Step 02
  - write down bibliographic information
- Step 03
  - outline and/or summarize the reference with ANT = Active Note Taking



Once you've got information...

- READ, READ, READ

# What to do with the info...

- Outline it.
- Discuss it.
- Get ideas from it.
- Begin to formulate tasks and objectives.

# SUNY College Credit

- As an Adjunct Professor at SUNY Albany, I can offer you 12 college credits for your research.
- Importance:
  - Graduate college early
  - Save money
  - Prepare yourself for college and career success with challenging work

What are research projects?

# Research Advisors and Mentors

- In order to qualify next school year for 4 college credits, you will need to find a mentor.
- A mentor is a professional or scientist that works in the topic you're interested in.
- They will help take your project to the next level.

What are research projects?

# Journal Entry

- STEP 01. What research topic are you interested in?
- Why is it important to have student/teacher conferences around every two weeks?
- What is the role of a mentor?
- **DON'T FORGET TO FEED YOUR AEM!**

What are research projects?

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# Admin.

- Create any pattern on the sheet (5 min.).
- Take attendance.
- Check Professional e-mails.
- Collect contact sheets.

What are research projects?