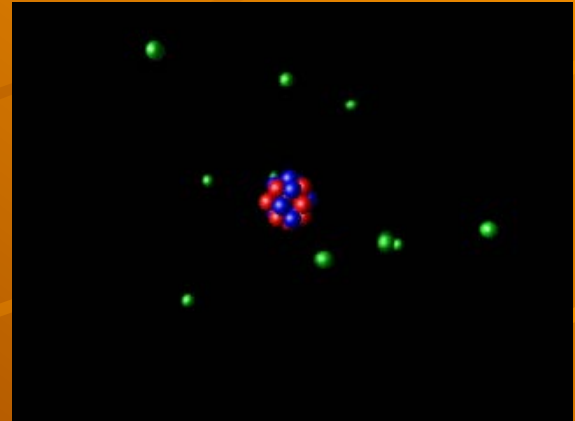


# What patterns “inhabit” nature?



Mr. M. Gonzalez



What patterns “inhabit” nature?

# Do now

- ✦ It may be said that life is like a surfer riding the wave of entropy.
- ✦ Discuss this analogy in your groups.
- ✦ If your group comes up with a different analogy, be prepared to share it.



What patterns "inhabit" nature?

# Objectives

- ◆ I can describe examples of how patterns exist in nature.
- ◆ I can explain how mathematics and graphs can be used to describe patterns in nature.
- ◆ I can list examples of natural cycles.



# Patterns

- ✦ **Patterns** are everywhere in nature.
- ✦ As the last lesson we had showed, they are as close as in your own bodies and as far as the ends of the Universe.
- ✦ **Patterns** are shapes or cycles that repeat themselves in different places or over different times.
- ✦ Because they repeat themselves you can predict how a pattern will continue even if you can't see the whole thing.

What patterns "inhabit" nature?

# Patterns

◆ Can you think of any examples of patterns?

◆ 1...

◆ 2...

◆ 3...

◆ 4...

◆ 5...

◆ 6...

What patterns "inhabit" nature?



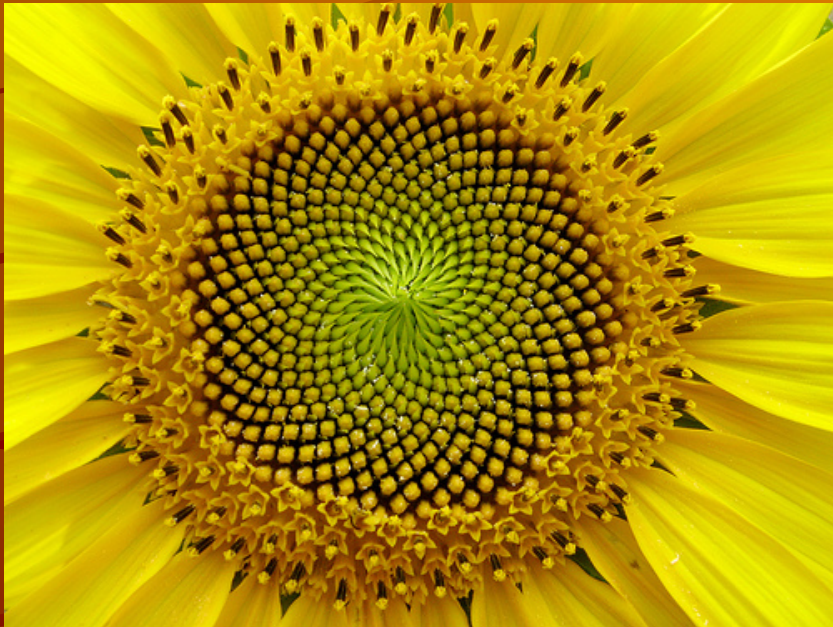
# Fibonacci sequence

- Look at the sequence below. What number comes next? What's the pattern?

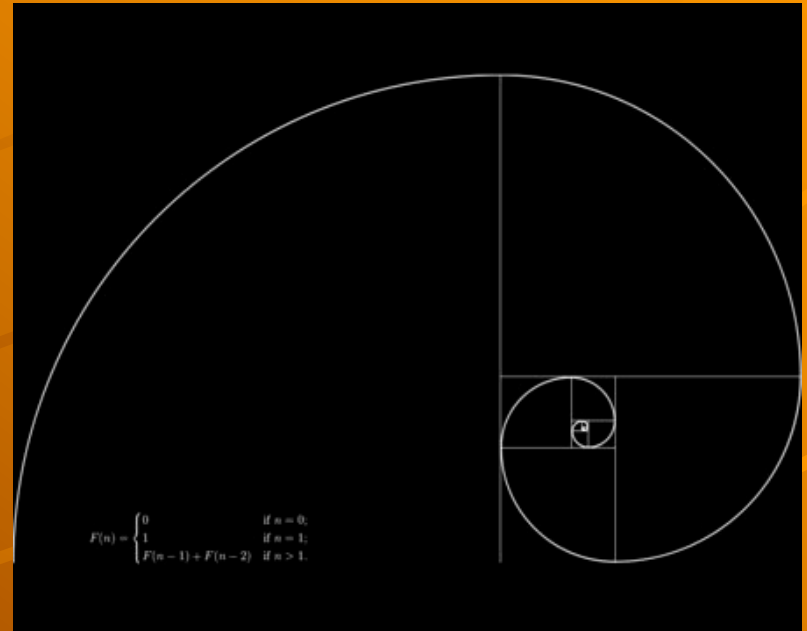
1 , 1 , 2 , 3 , 5 , 8 , 13 , 21 , 34



# Fibonacci Sequence



[http://farm2.static.flickr.com/1278/694780262\\_8874b4f225.jpg](http://farm2.static.flickr.com/1278/694780262_8874b4f225.jpg)



<http://static.desktopnexus.com/wallpapers/26237-bigthumbnail.jpg>

What patterns "inhabit" nature?

# Patterns

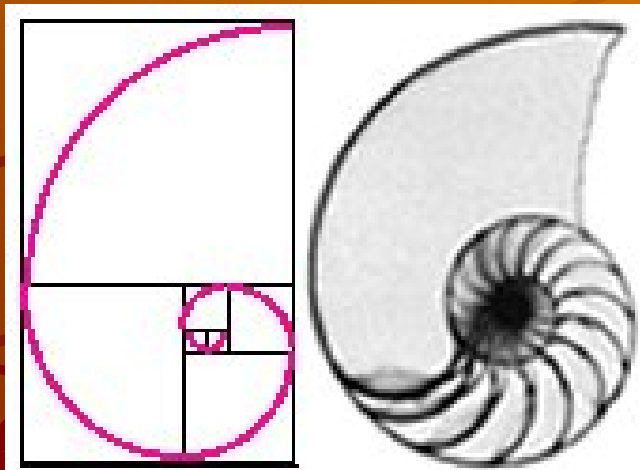
◆ One of the *major* purposes of science is to find *patterns* in nature.



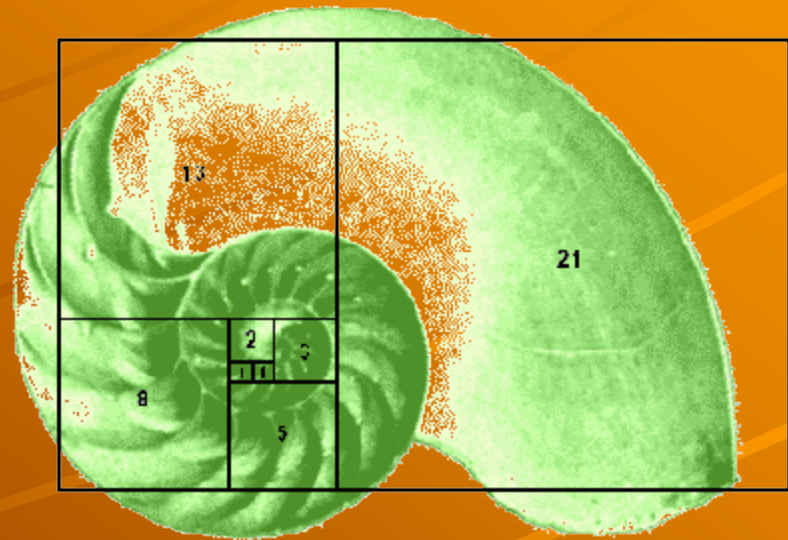
What patterns “inhabit” nature?



# Fibonacci Sequence



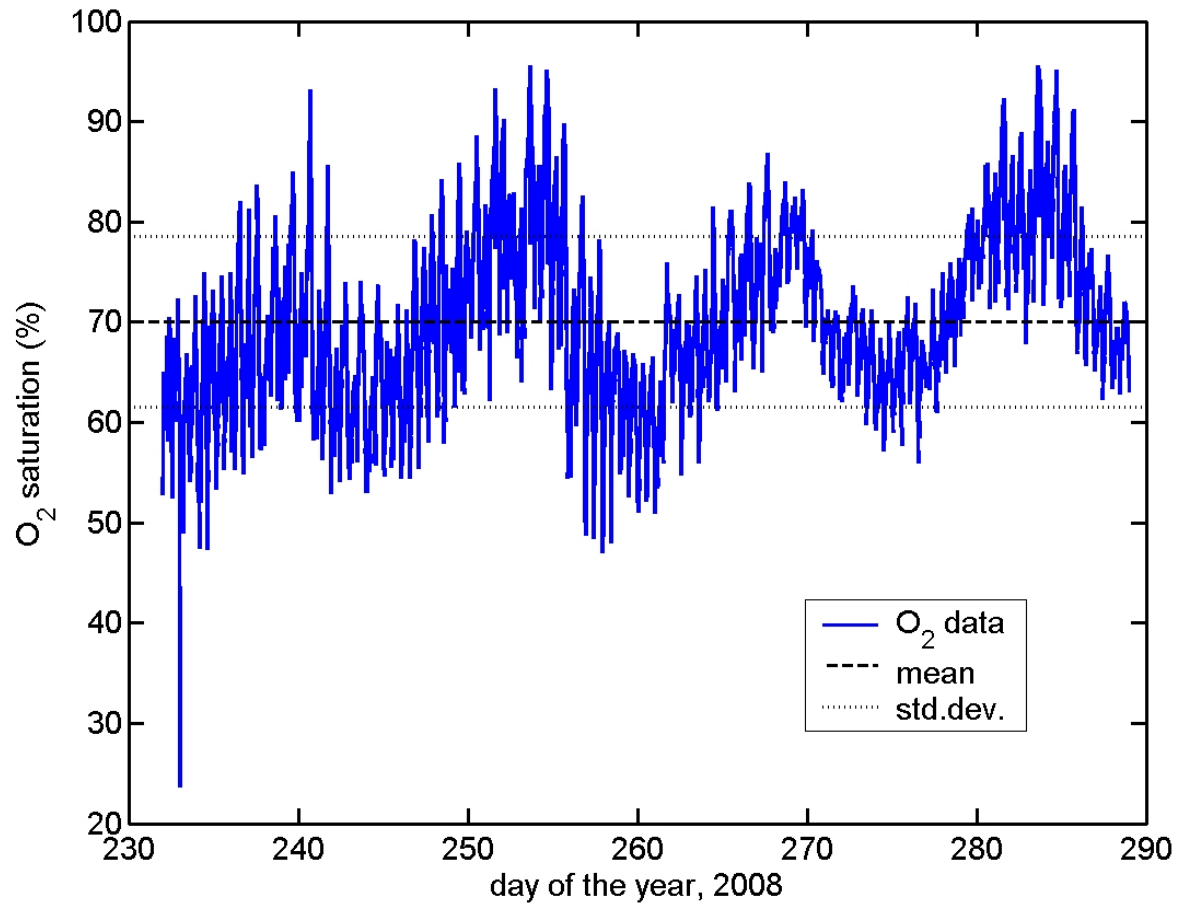
<http://www.laputanlogic.com/images/2006/04/24-11B3JJHW700.jpg>



[http://www.mathacademy.com/pr/prime/articles/fibonac/fibonac\\_8.gif](http://www.mathacademy.com/pr/prime/articles/fibonac/fibonac_8.gif)

What patterns "inhabit" nature?

# O<sub>2</sub> Levels in the Hudson River



# Patterns

✦ Because patterns exist in nature we can use **Mathematics** to study and describe NATURE.



What patterns “inhabit” nature?

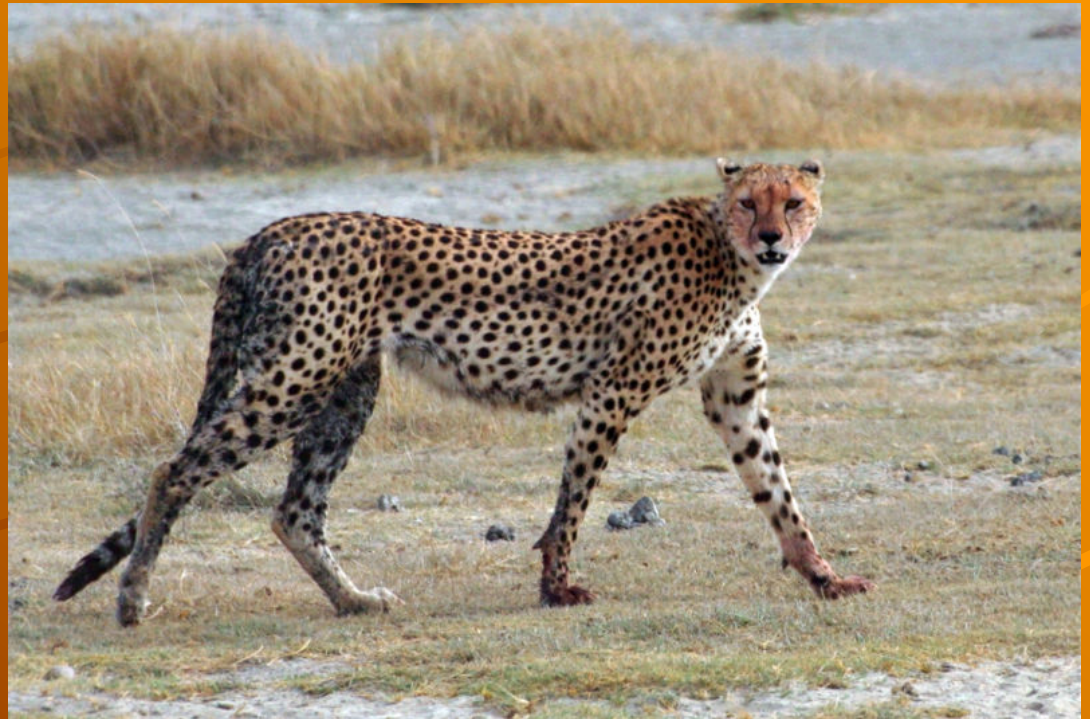
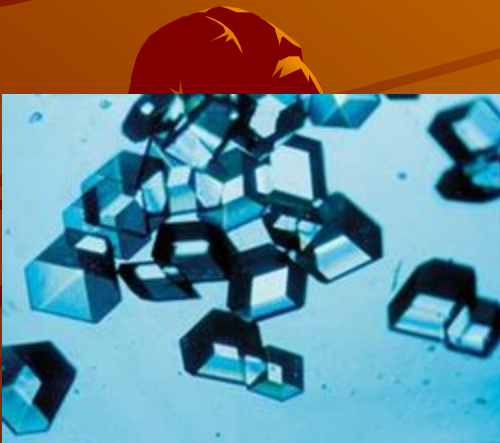
# Patterns



What patterns “inhabit” nature?



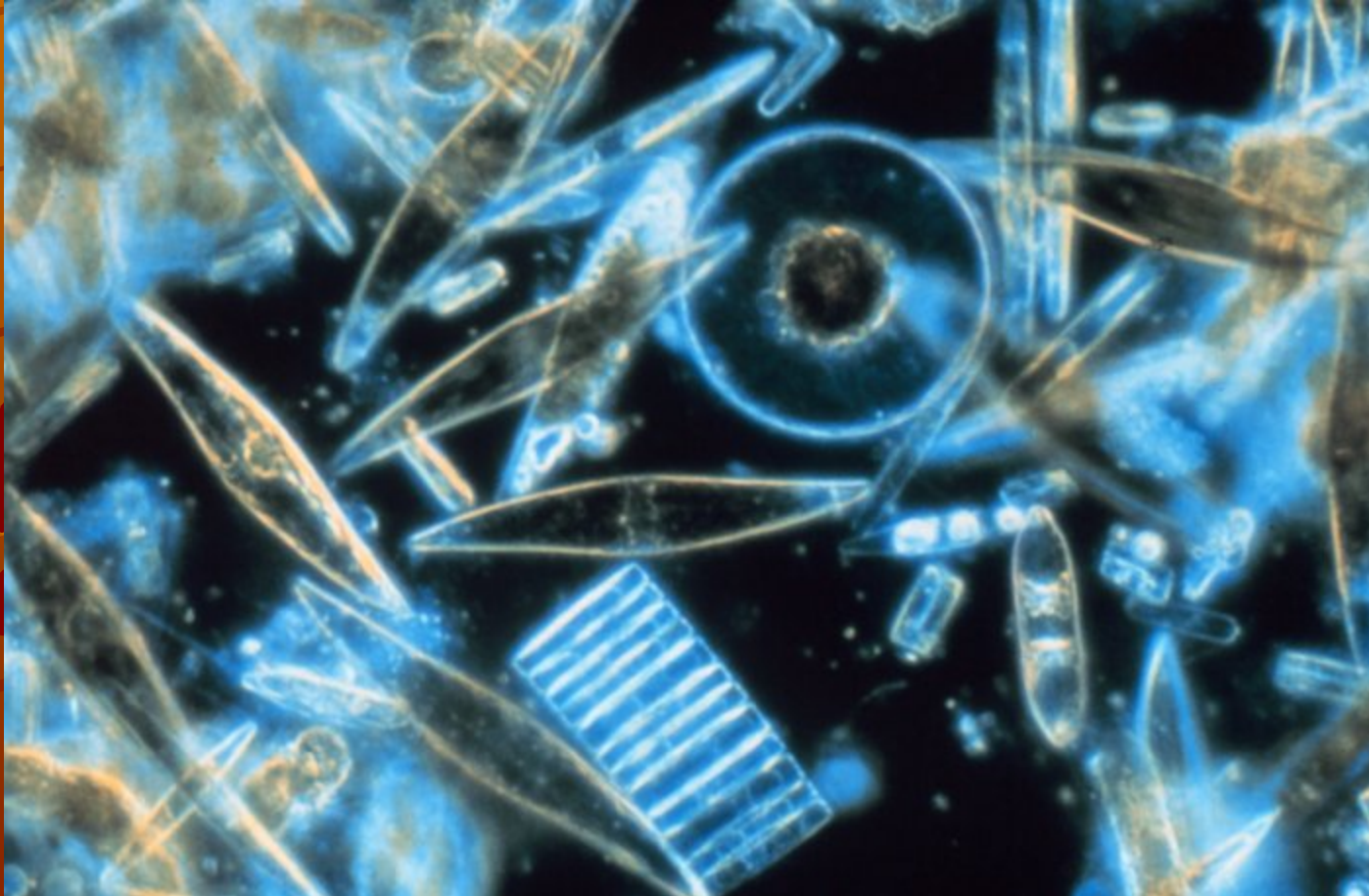
# PATTERNS



What patterns “inhabit” nature?

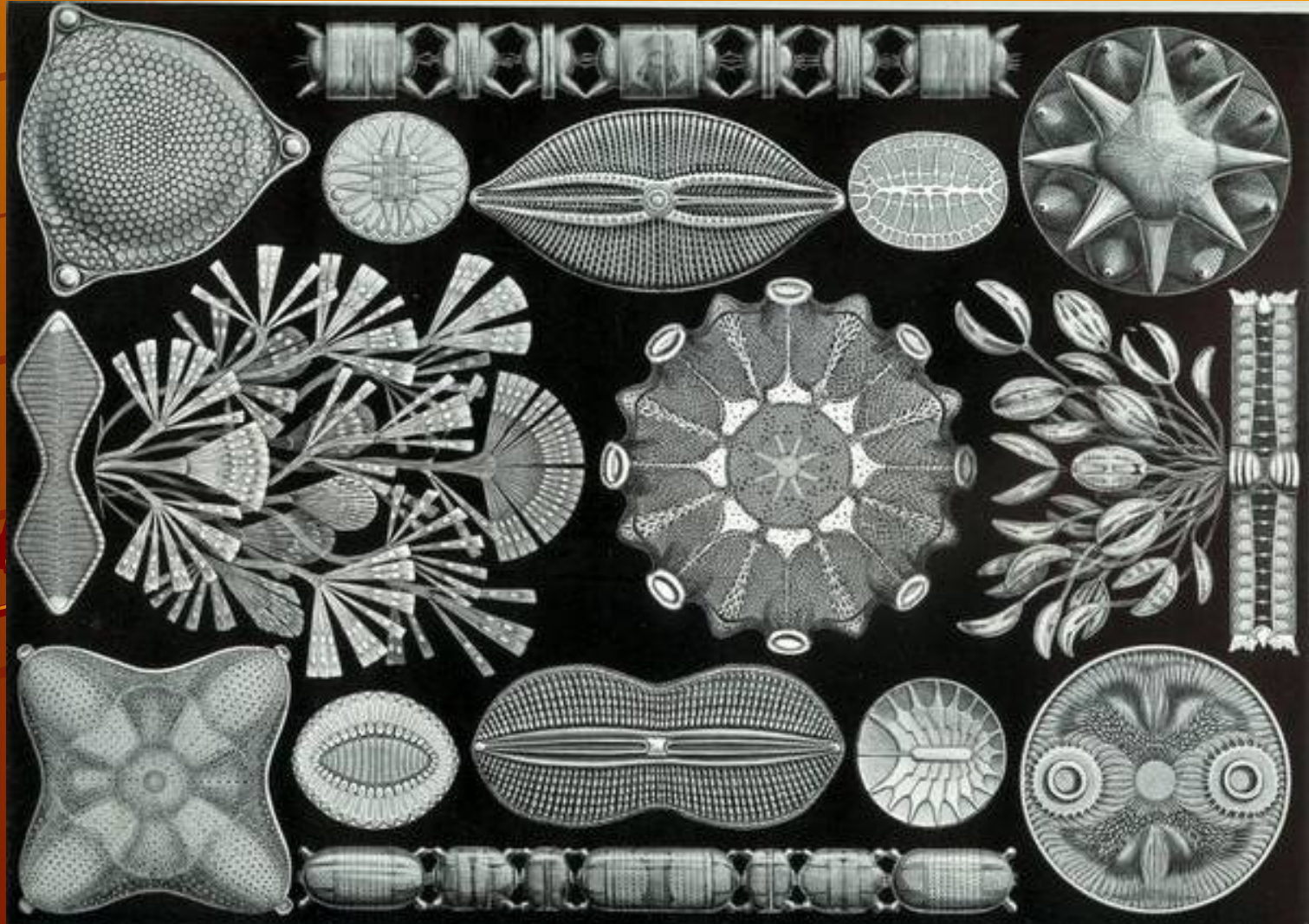


# DIATOMS



What patterns "inhabit" nature?

# DIATOMS





# PATTERNS



What patterns "inhabit" nature?

# PATTERNS



What patterns "inhabit" nature?



# PATTERNS



What patterns "inhabit" nature?



# PATTERNS



# Spiral Galaxies + Hurricanes

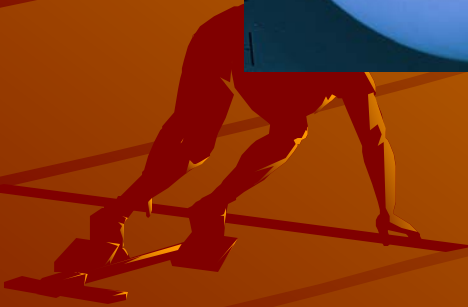
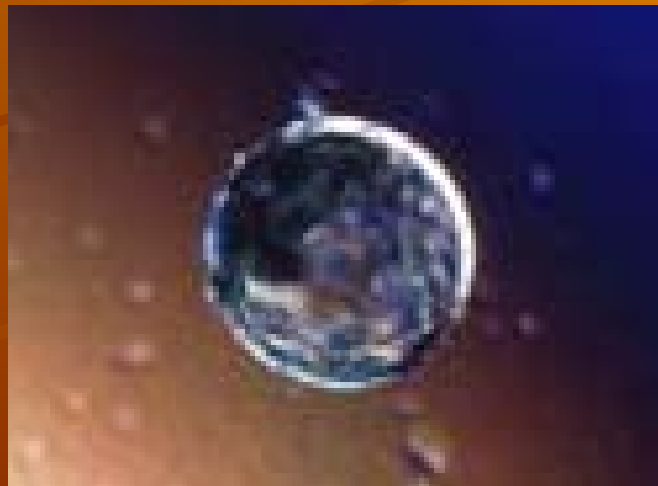
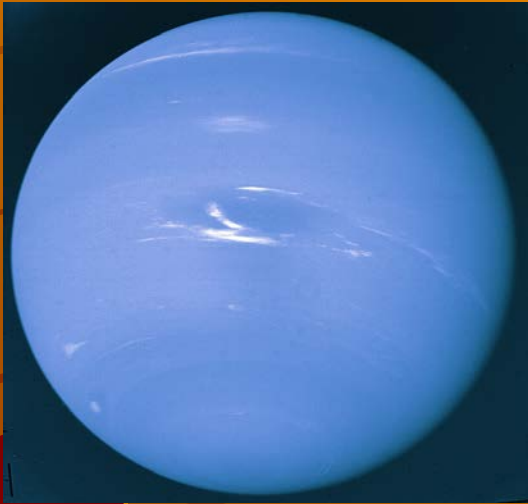


[http://www.windows2universe.org/the\\_universe/images/ngc1232\\_sm.jpg](http://www.windows2universe.org/the_universe/images/ngc1232_sm.jpg)



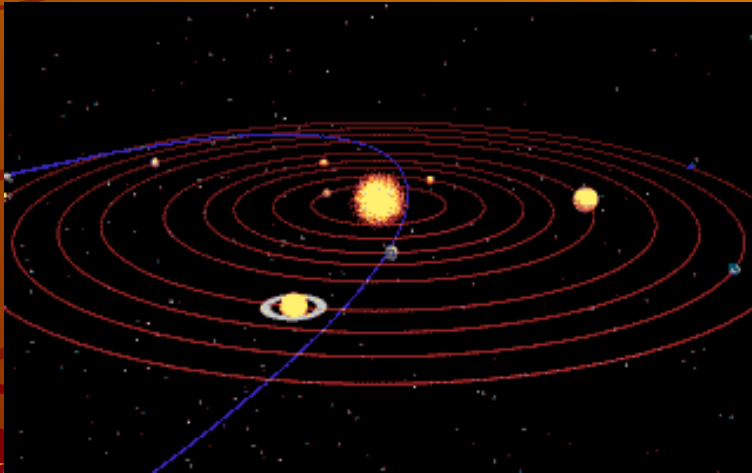
What patterns "inhabit" nature?

# PATTERNS

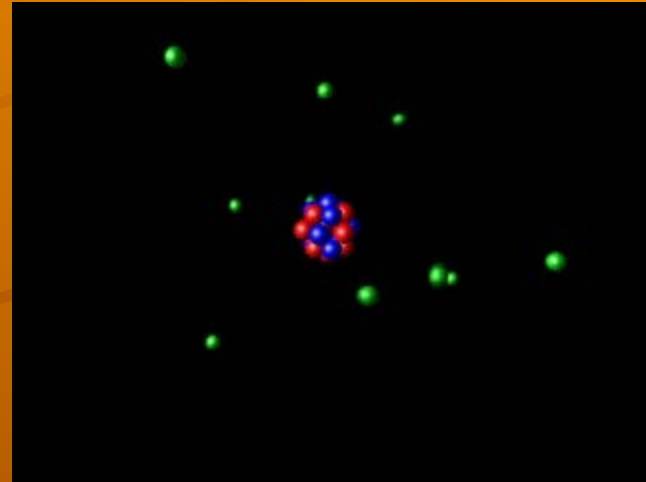




# Solar system + Atoms



<http://www.zephyrus.co.uk/planetanimate1.gif>



What patterns “inhabit” nature?

# Patterns

◆ When things don't follow patterns they are:

**CHAOTIC** and/or **AMORPHIC**



What patterns "inhabit" nature?



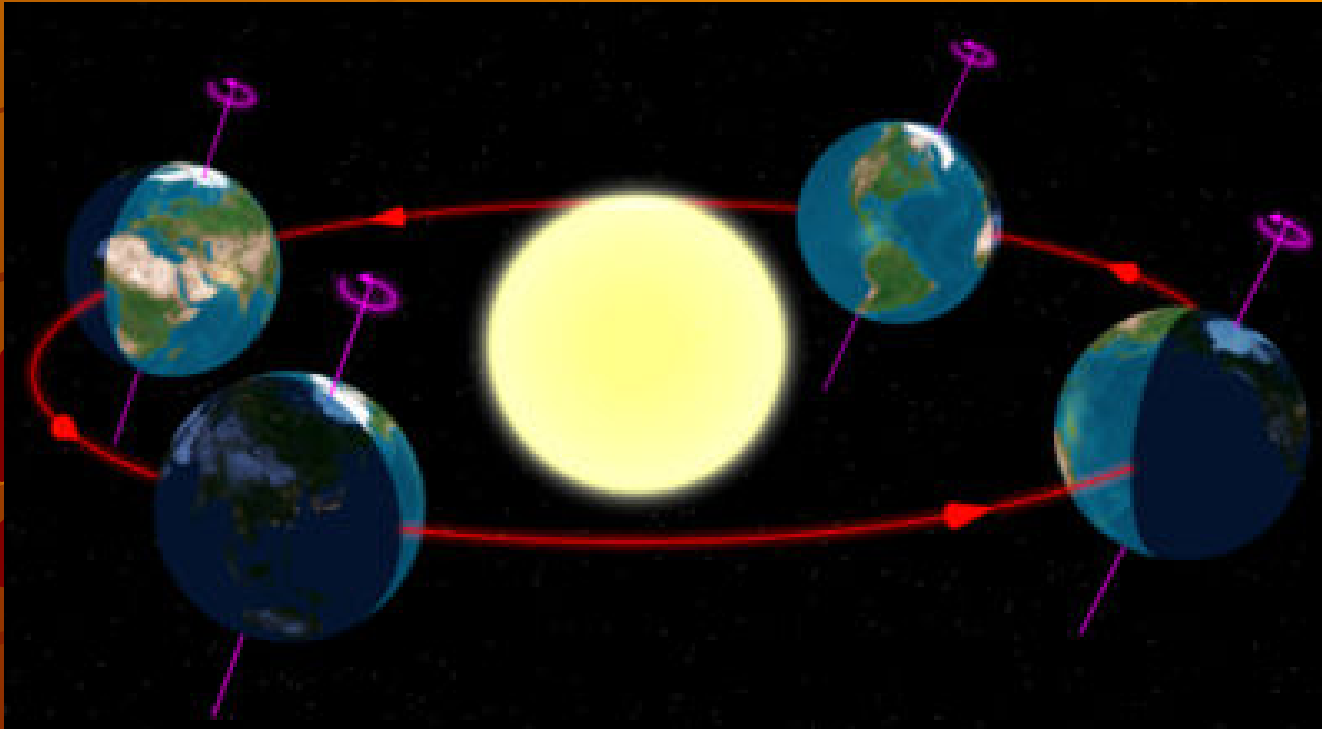
# CYCLES

- ◆ In nature many **patterns** are found in the form of **cycles**.
- ◆ These cycles repeat themselves over time.
- ◆ Can you think of some cycles in nature?



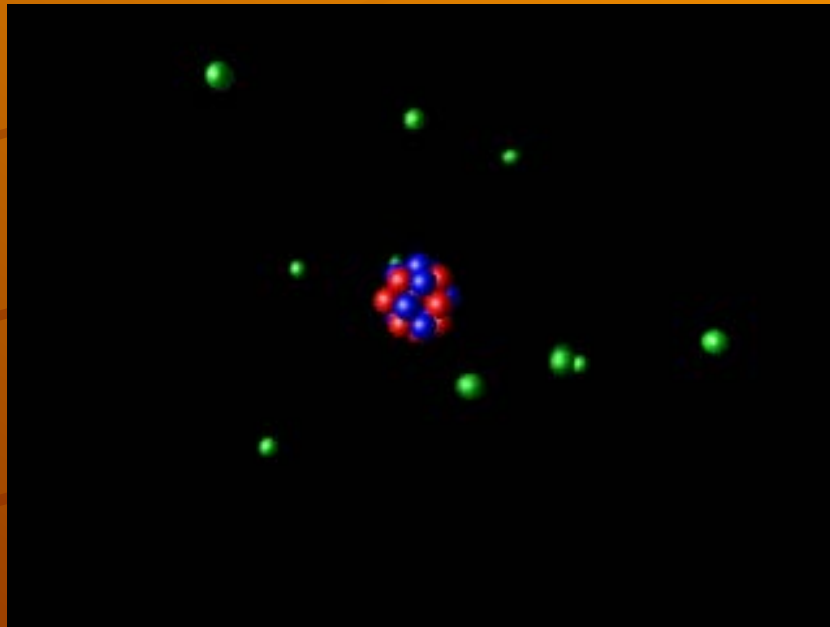
What patterns “inhabit” nature?

# CYCLES OF YEARS



What patterns "inhabit" nature?

# CYCLES OF ELECTRONS



What patterns “inhabit” nature?

# CYCLES OF SEASONS



What patterns “inhabit” nature?



# CYCLES



What patterns “inhabit” nature?



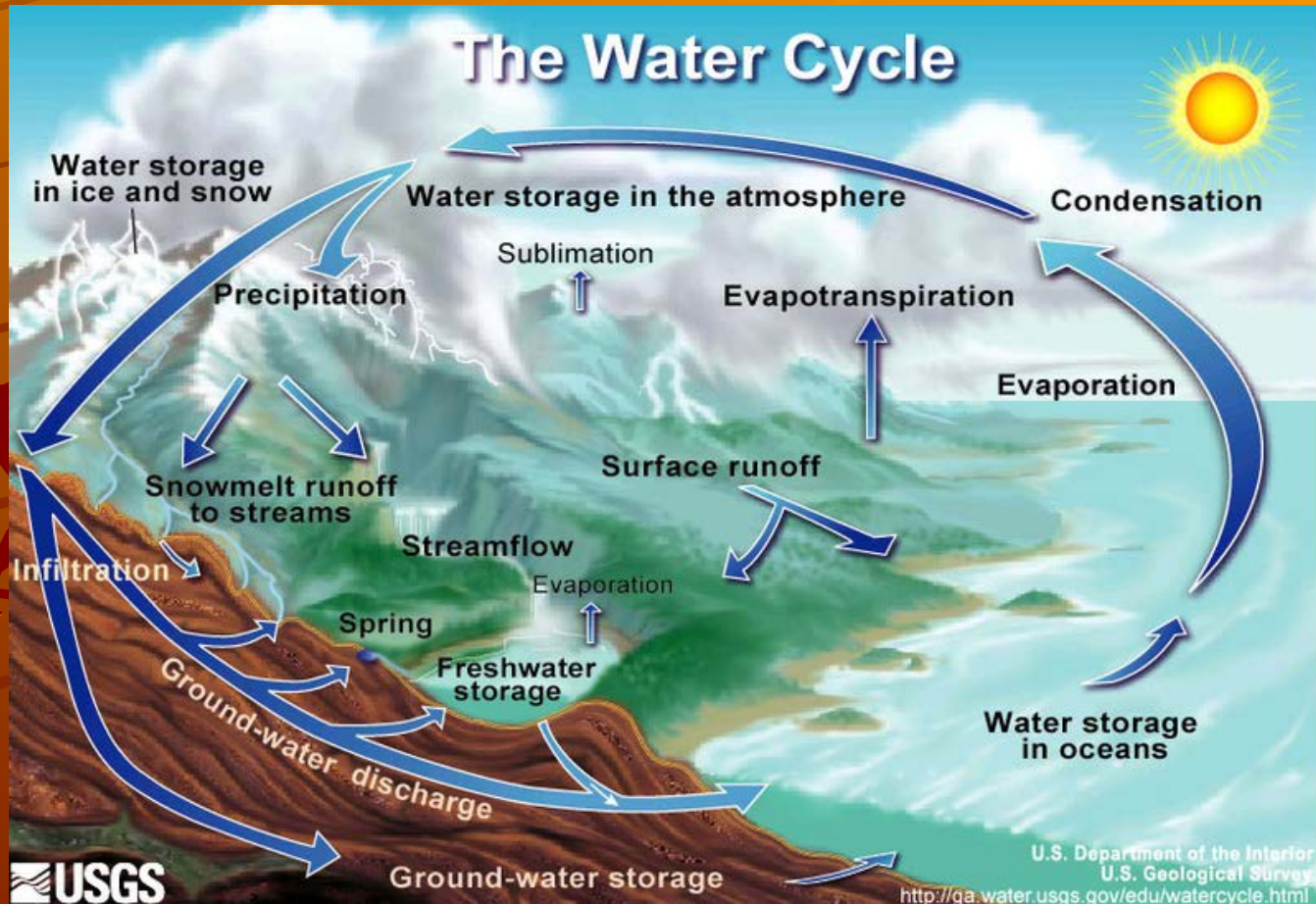
# CYCLES



❖ What comes next?

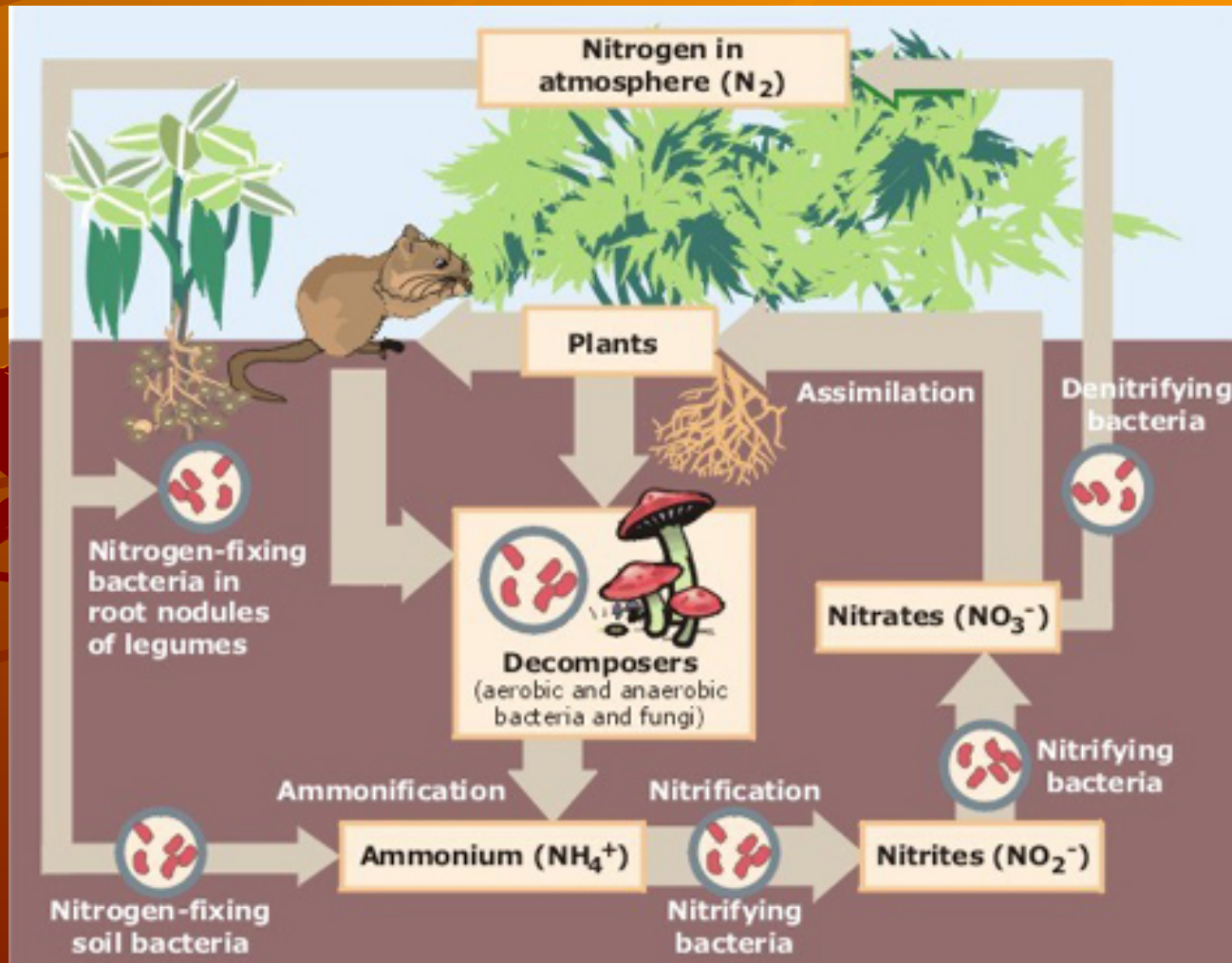
What patterns “inhabit” nature?

# CYCLES OF ELEMENTS



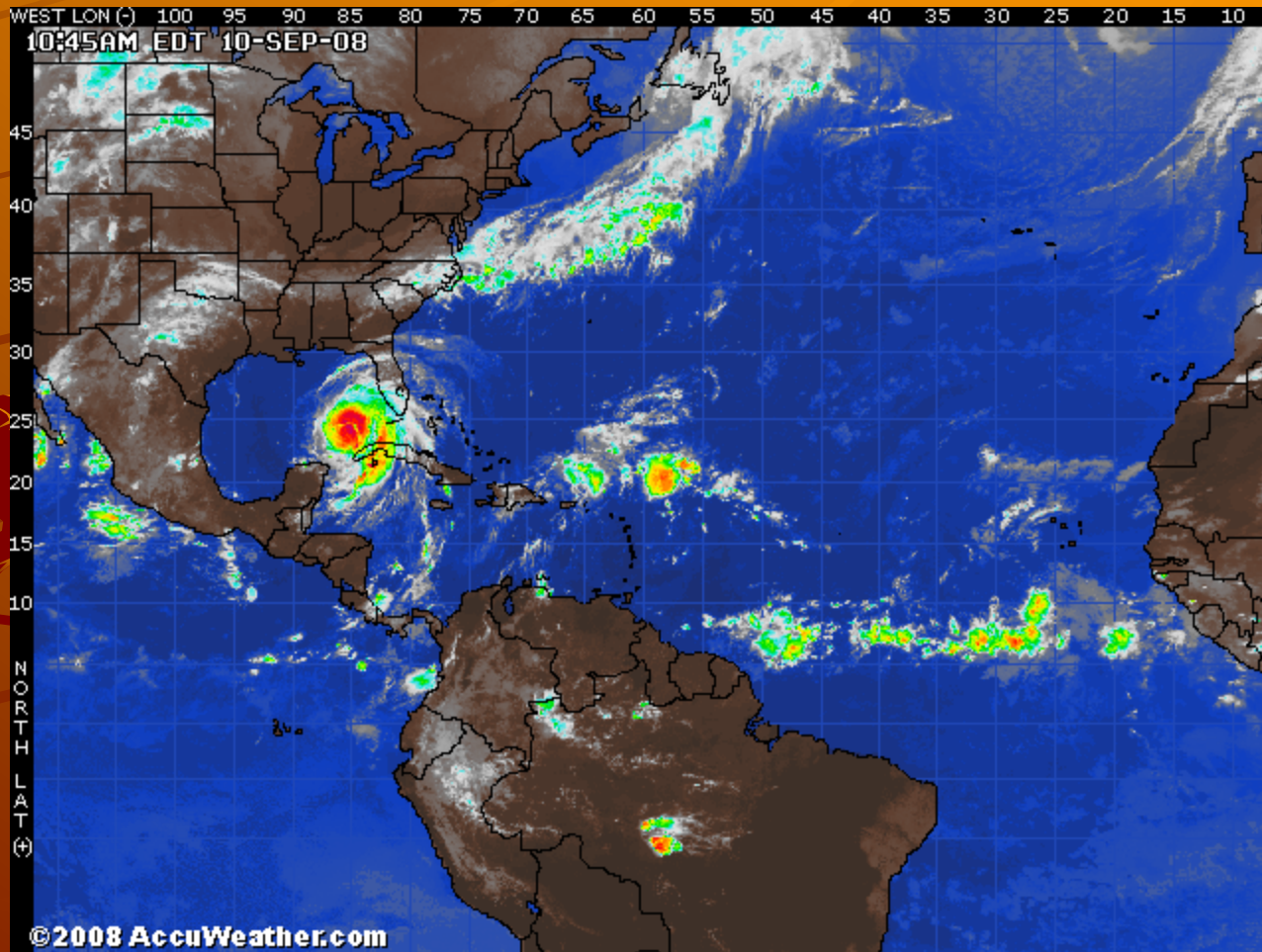
What patterns "inhabit" nature?

# CYCLES OF NUTRIENTS





# CYCLES OF WEATHER





# CYCLES

ANSWER IN YOUR NOTEBOOKS. WRITE THE QUESTIONS!

- ◆ Is it possible to predict when hurricane season begins?
- ◆ Why can you predict this?
- ◆ Explain why nature may have developed patterns?
- ◆ What would the world be like without patterns?

# Homework

- ◆ What patterns do you follow in Life?
- ◆ What patterns do you try not to follow in Life?



What patterns “inhabit” nature?