

Lisa & Krystle

A STEM PROJECT SUMMARY



Our Approach/Goals

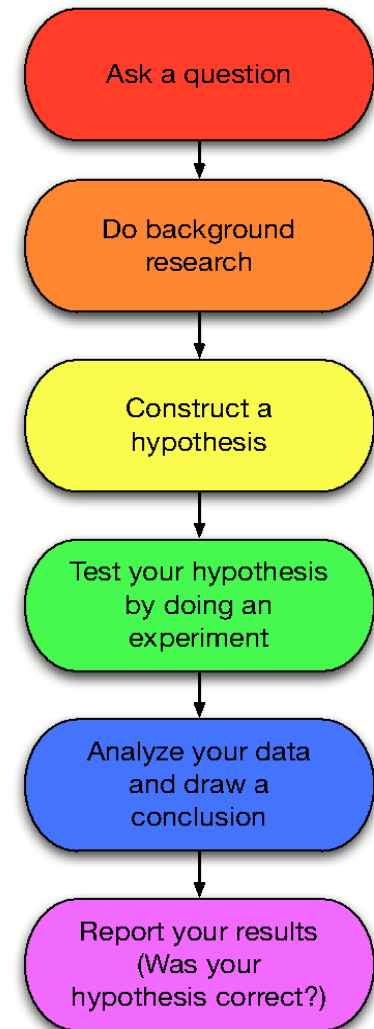
Semester One: 8/10-12/10

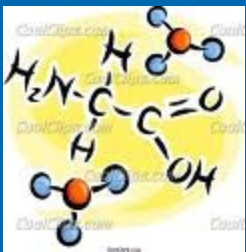
- ▶ Match the Biology curriculum to the STEM program and the research being done by Krystle and the other fellows.
- ▶ Incorporate Krystle's area of research to many of the units in the Biology curriculum.
- ▶ Lisa will administer a pre/post test for some of her units to collect data on how real world applications are accepted and understood in her Biology classroom. Possibly a paper for the education community?
- ▶ Interdisciplinary module (by Dan)?

Scientific Method

- ▶ Scientific Method
- ▶ How do scientists use it? How do you use the scientific method every day?
- ▶ Graphing Review
- ▶ Size and Scale

The Scientific Method



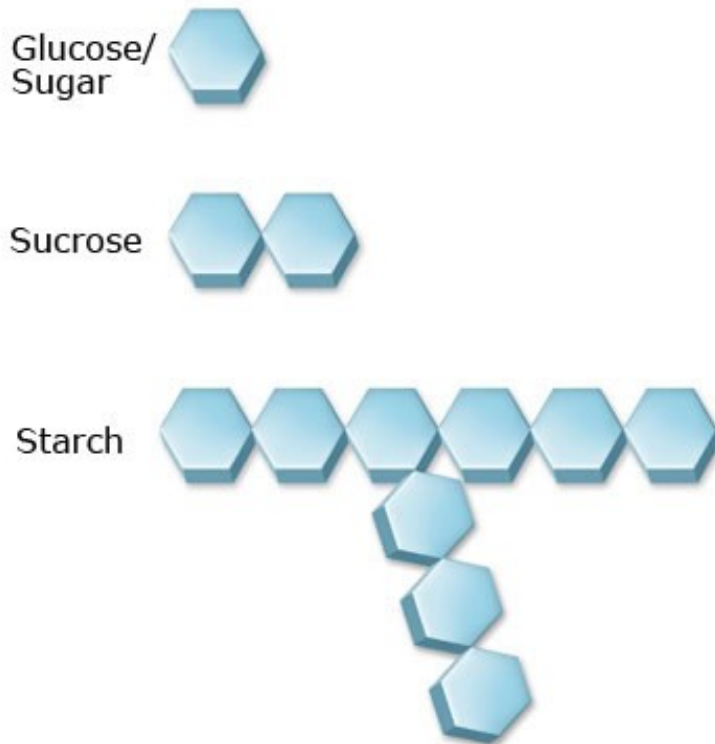


Atoms, Elements, and Bonds

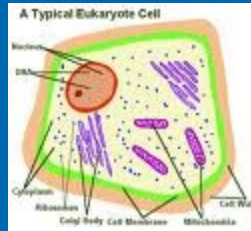
1. Periodic Table, Atoms, Elements, Bonds
2. What is an atom?
3. What is an element?
4. How do we organize the Periodic Table of Elements
5. Atomic number, atomic mass, electrons, protons, neutrons
6. Types of bonds in large molecules
7. ****Balancing equations**** if time allowed.

Macromolecules

Sucrose and Starch are Comprised of Sugar



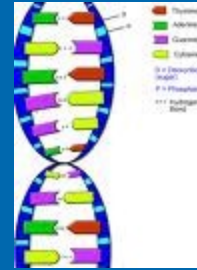
1. Four major macromolecules for study: Carbohydrates, Lipids, Proteins (**Enzymes-Krystle?**), and Nucleic Acids.
2. What elements make up these molecules?
3. What is the structures of these molecules...and how does the shape determine the characteristics of the molecule.
4. Energy released by breaking these bonds...Energy in general.



The Cell

1. Students will learn the structure of the cell including organelles and their "job" within the cell.
2. What is the difference between an animal cell and a plant cell?
3. How to use the microscope.
4. What is the significance of the cell membrane? (I teach osmosis and diffusion here...along with isotonic solution, hypo/hypertonic solutions)
5. Photosynthesis vs. Cellular Respiration and where these reactions occur to make energy for the cell...
6. How do we get specialized cells? What do they look like? What is a stem cell? (Krystle)
7. Mitosis vs. Meiosis
8. Cancer and other diseases
9. Stem Cells and their significance

DNA/Genetics



1. The nucleus!
2. What is DNA? What is the structure of DNA? How do we get a copy of the "mother" cells DNA into new cells?
3. DNA, RNA, Protein Synthesis
4. Modern biotechnology techniques that scientists use (PCR....)....(Krystle)
5. How do we get our traits?
6. Dominant vs. Recessive traits...(co-dominance...sex-linked...if time allows)
7. Monohybrid and Dihybrid crosses

Second Semester 1/11-5/11

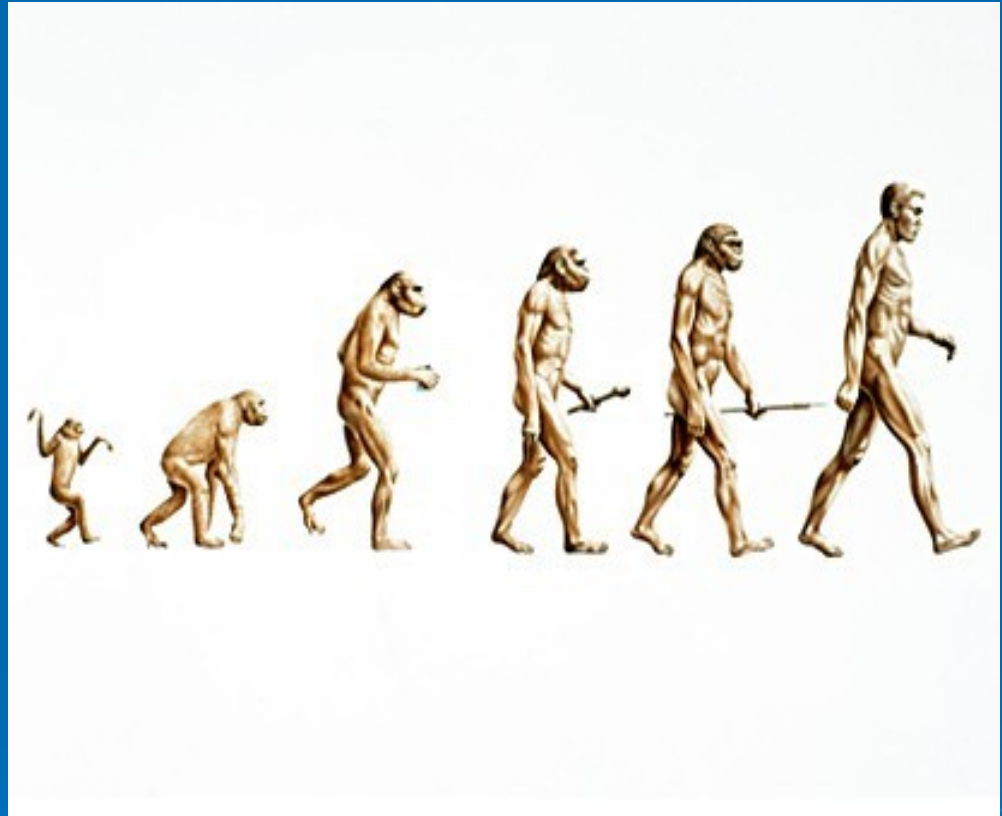
We begin with...



1. Monohybrid Genetics Cont...
2. & Dihybrid Crosses review
3. Genetic Pedigrees
4. Genetic Mutations

Evolution and the Classification of Living Things

1. Evolution and Other Theories on How "We" Came to Be.
2. Taxonomy and Dichotomous Keys
3. Levels of Classification
4. Kingdom and Phylum Investigation
5. Comparative Anatomy of the Shark and the fetal Pig





Ecology

Levels of Organization, Biosphere and Biomes,
Ecosystems (Communities, Populations, Organism, etc),
Abiotic vs. Biotic Factors, Niche, Symbiotic Relationships,
Energy Transfer, Food Pyramids, Food Chains,
Etc...Discussion of our Earth's Future...Humankind's
Future.