Student Understanding

- Students can write a hypothesis and know the steps of the scientific method.
- They know the difference between a theory and a hypothesis.
- They know the difference between and inference and an observation.
- They can identify the parts of controlled experiment.

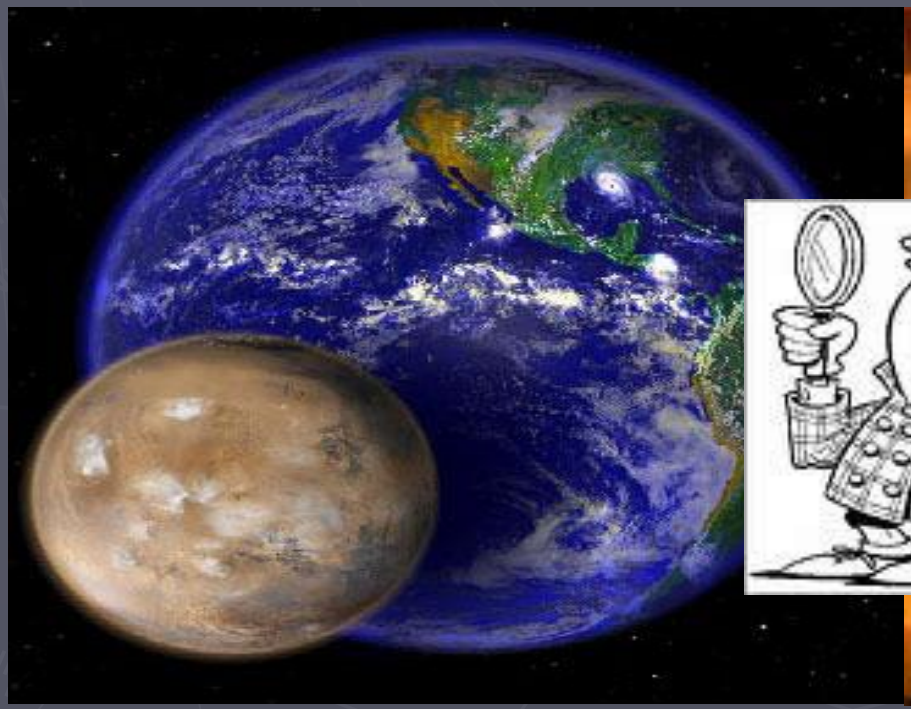
Date: August 26/27
Lesson: The Scientific Method

- What you need Textbook, your notebook, pen or pencil, worksheet, 1 colored paper, markers & scissors to share
- Vocabulary: (write the full definition in either English or Spanish)
- **1. hypothesis**
- **2. variable**
- **3. theory**

Beginning of class….

- Start after your last lesson (don't skip pages)
- Did you list the date?
- Did you write the lesson name on top?
- Is your stuff (purse, backpack, coat….) off your desk?

Science is an organized way of using evidence to learn & make predictions about the natural world



The Scientific Method

- 1. observation
- 2. hypothesis
- 3. experiment (repeat)
- 4. conclusion
- 5. theory

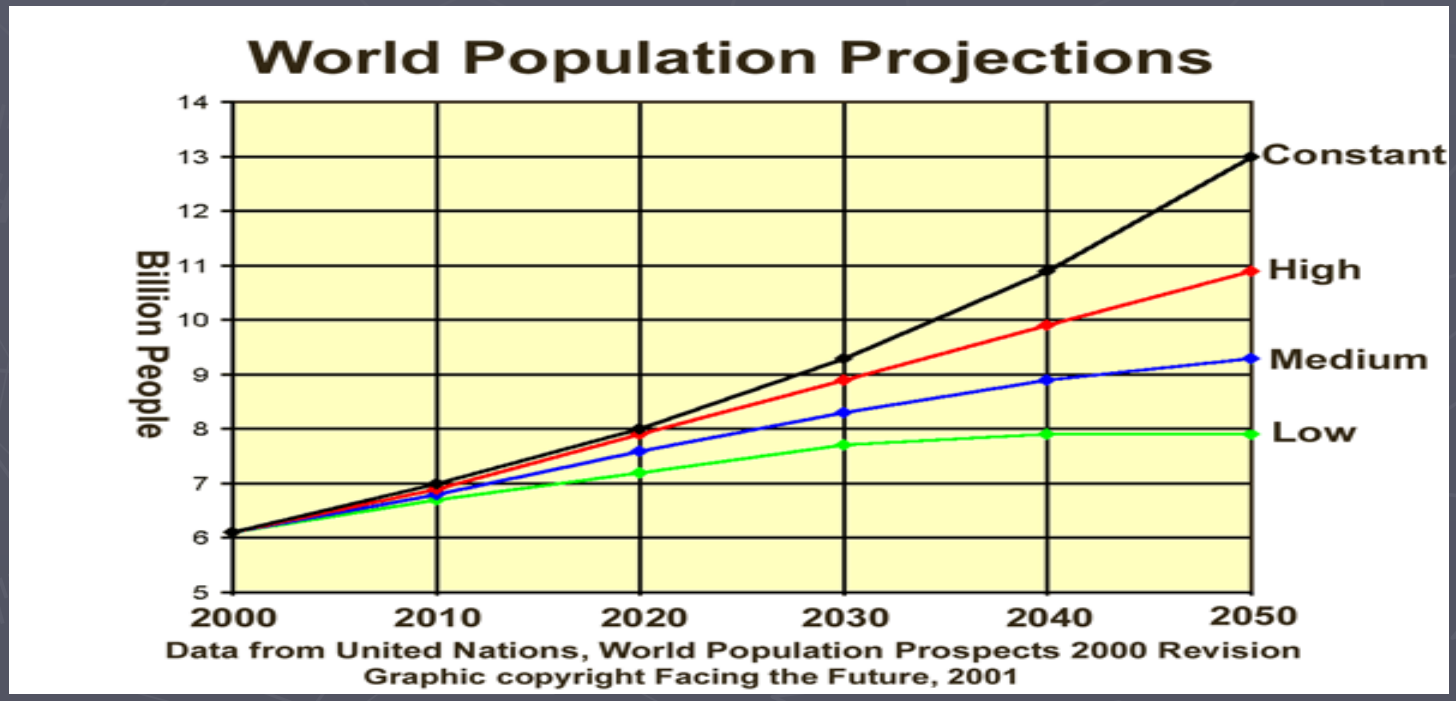
1. Observation

- Observations generally involve using one's senses. The information gathered then is called data.

Collect *Data* about Question

Quantitative data is measurable

Qualitative data can't usually be counted.



Quantitative or. Qualitative

- Weight and Height are an example of?

- The manatee seems healthy and alert is an example of?

Other ways of collecting data

What if I am trying to figure out what gives someone pimples.

Let's "brainstorm" some of the things that we think cause pimples>>>>>

Where else could I go to do research?

Are all sources equally reliable?

(name some of each)

2. Developing a hypothesis

- Ask a question about the problem you observe.
- Example:
  - Does eating chocolate give you zits?
  - Do boys who wear cologne get more dates?
  - Does eating starchy food make you fat?

Hypothesis

- "an educated guess"
- Cause and result format
- testable & measureable statement.
- (not in the form
- of a ?)

Is it a "good" hypothesis?

1. Longer hair makes a girl prettier.
2. Raising the temperature of a cup of water will increase the amount of sugar that will dissolve in it .
3. If I open the faucet more it will increase the flow of water.

(Copy these 3 examples)

- Does science change?
- Can you think of any examples?

Question Everything.

- This book contains a lot of facts but don't think science is a set of truths that do not change.
- Science is always an ongoing process that involves asking question, observing, making inferences, and testing hypothesis.

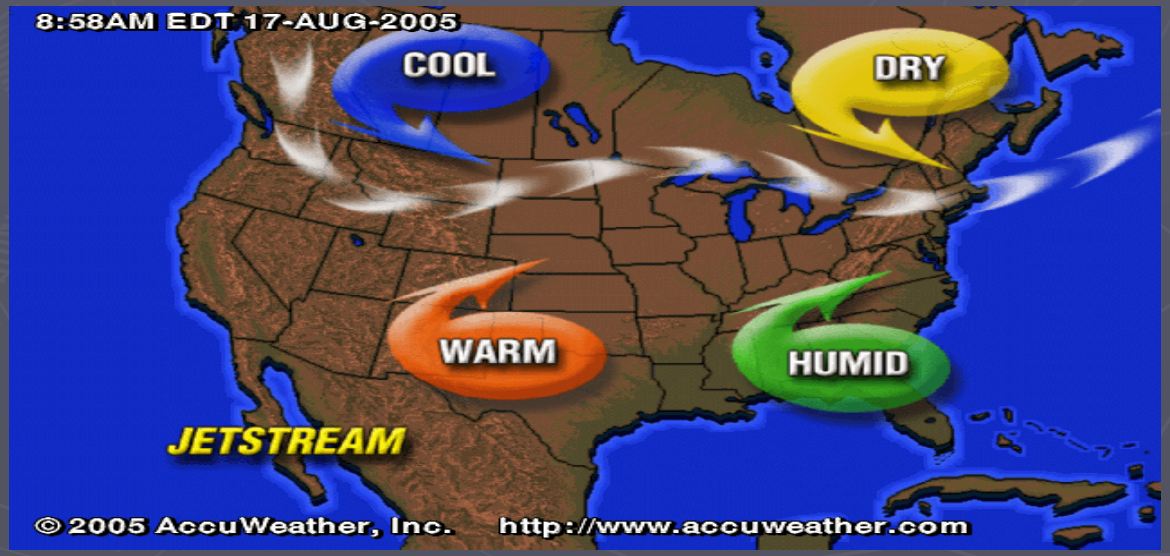
Science is always changing!

- What I learned is different than what you will learn today.
- Someday when you help your children with science homework, the book will teach some things differently based on new discoveries.

Setting Up a Controlled Experiment

- Testing a hypothesis often involves designing an experiment.
- **The factors in the experiment that can change are called variables.**

Ex: weather, materials, light, time, space, etc.



When Experiments Are Not Possible

- **Field studies** – If a scientist wanted to gain a better understanding of a particular organism **in the wild then an experiment would be impossible.**
- Can you think of an experiment that would require a field study? Write your example down.

Making inferences

- Inference – guess made based on prior knowledge
- Example: it is raining outside = I don't need my sunglasses today.
- I want to sample for nitrogen pollution in a lake to see if it is killing fish. I take a small sample of water. How is inference used?

Controlled Experiment

- Only one variable should be tested at a time.
- Can you guess why?
- Example: I want to test why Carlos has so many girlfriends at his house. I am going to see if his luck with women is related to the amount of cologne he wears or how many times a week his mother makes *tres leches.*

You need to be able to pick out….

- **1. independent variable – the thing you are changing – THE CAUSE**
- **2. dependant variable – the change that happens – THE RESULT**
- **3. the constants – variables that stay the same in the things you are comparing**
- **4. the control – not a part of the experiment**
  - **(don't always have one)**

1 Exploring Redi's Experiment

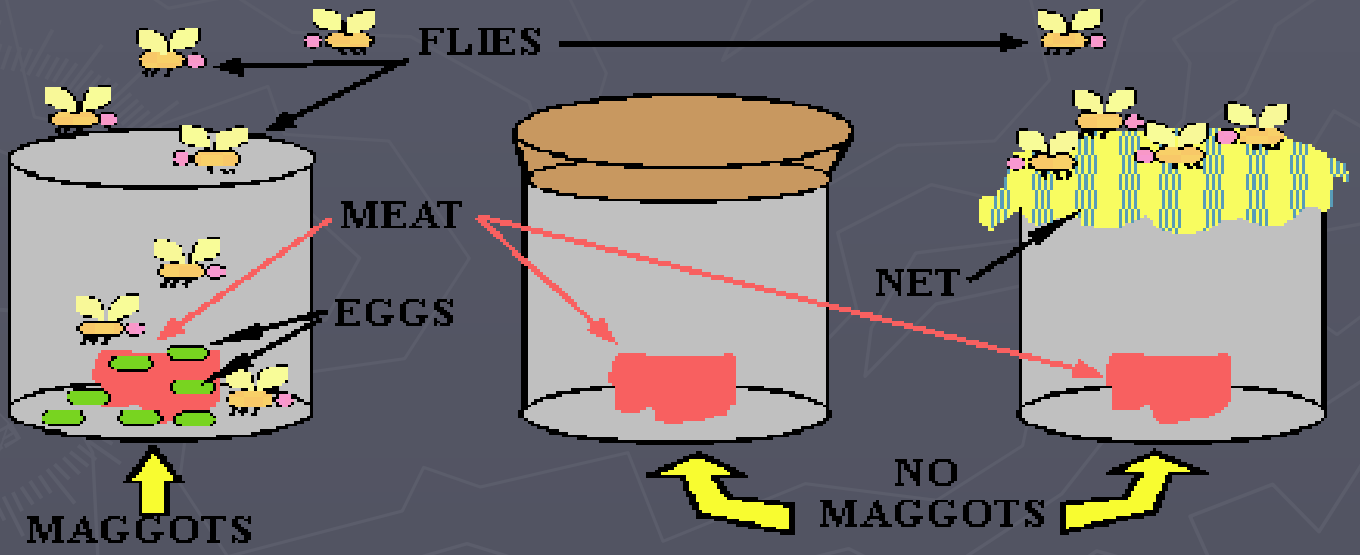
1. One jar was left uncovered. The second jar was covered.

2. Maggots appeared on the meat in the open jar.

3. Redi concluded that meat did not produce maggots.

Questions

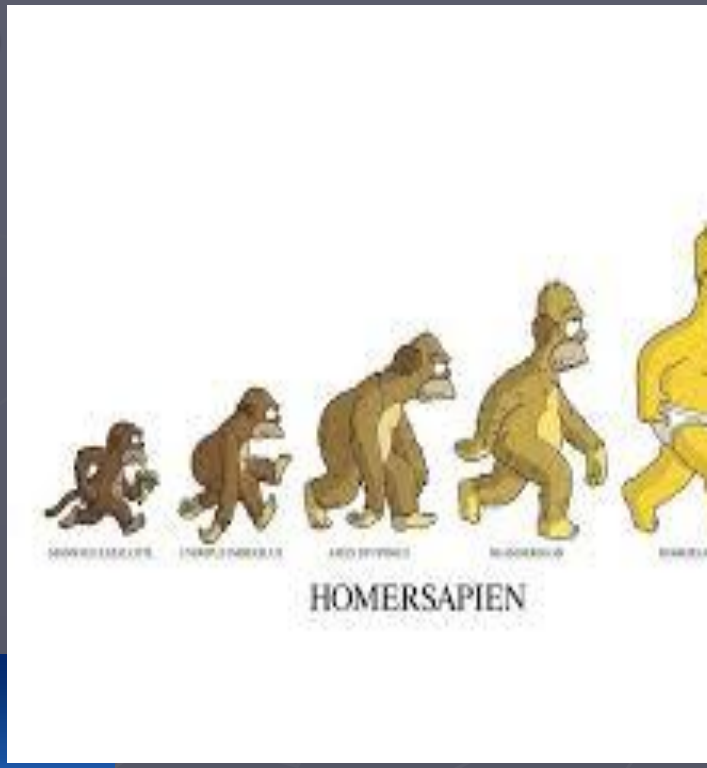
- What are the controlled variables?
- What is the independent variable?
- What would be the dependent variable?



- Foldable - Make a foldable demonstrating the parts of an experiment using 3 different examples

- Simpson's worksheet

What do these 3 have in common?



End of class

- Fold the first page (only) of today's lesson in ½.
- Put your notebook in the crate (never take it home!) and your other materials away…neatly!
- Is you desk and surrounding area the way you found it?