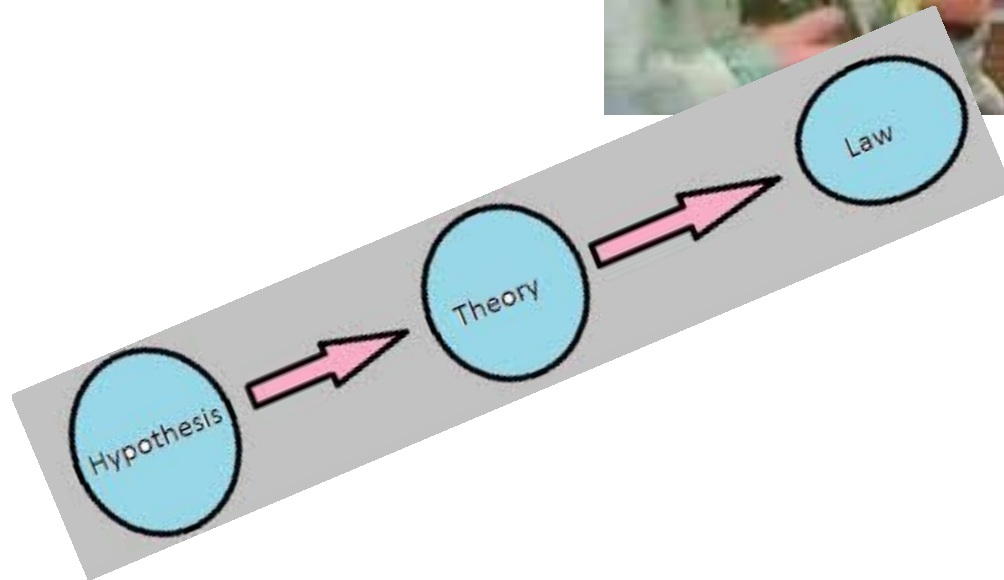


Scientific Method

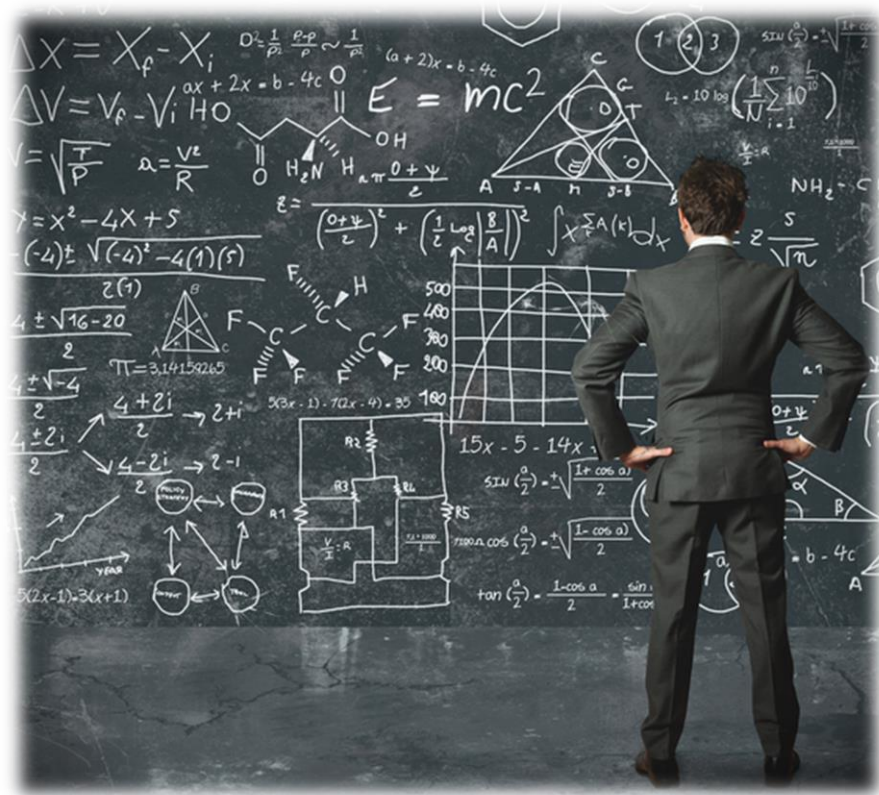
What is Science?

- Learning from:
 - Observation
 - Experiments



Scientific Theory

- An explanation or a model
- Accepted in the Scientific Community
- Based on observations, experiments, and reasoning
- **TESTED!**
- **CONFIRMED!**





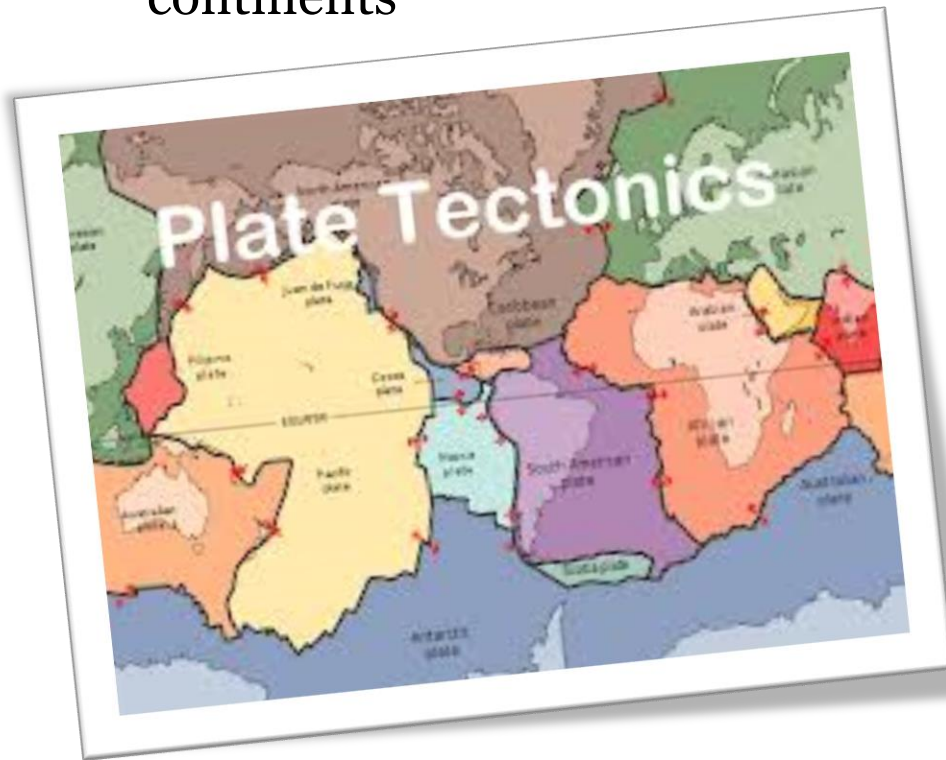
Gravity

Just a theory.

Scientific Theory Examples

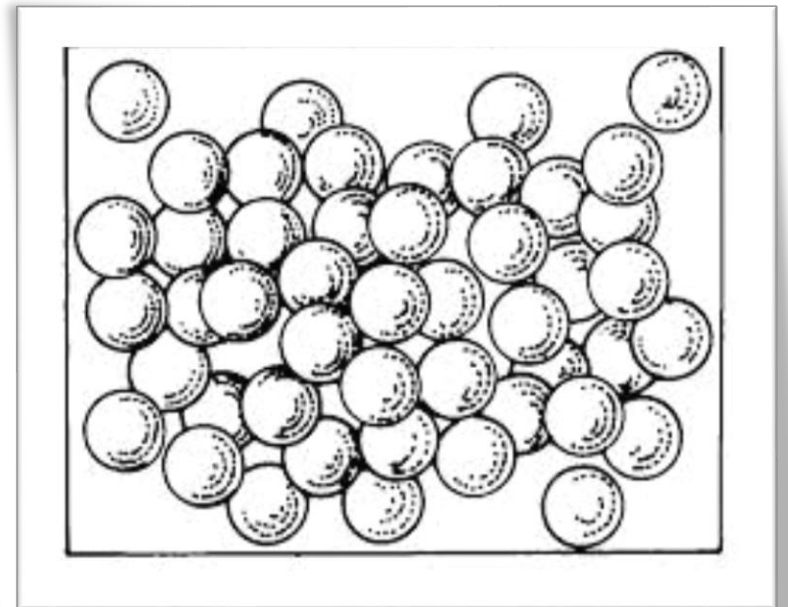
Theory of Plate Tectonics

- Explains movement of the continents



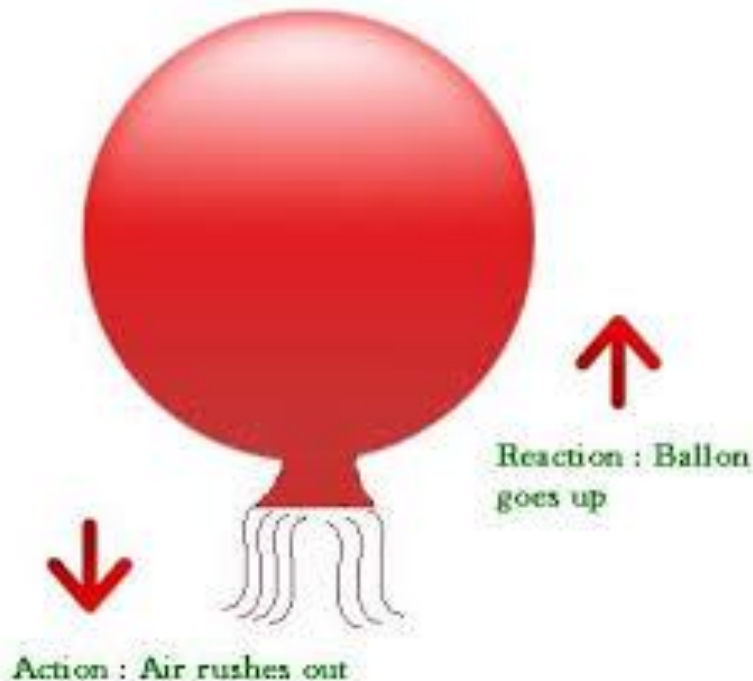
Particle Theory

- All matter is made of particles



Scientific Law

- A statement of what always occurs under certain conditions



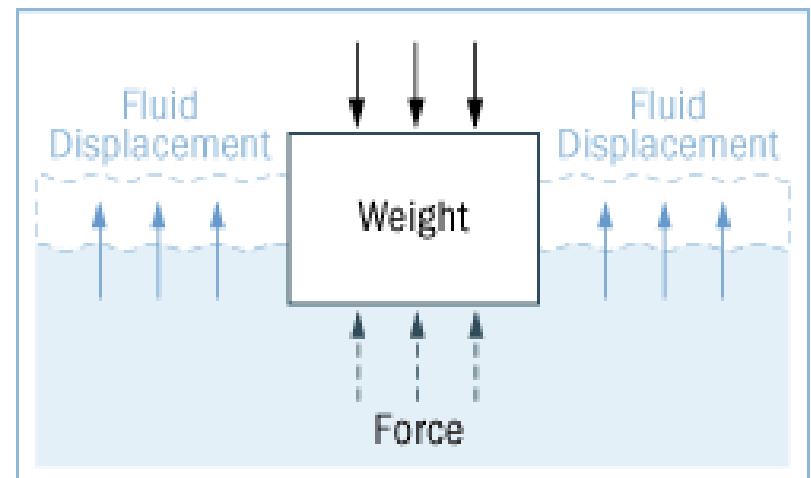
- Examples:

- Newton's Laws of Motion:

- An object in motion stays in motion
 - $F = m \times a$
 - For every action, there is an equal and opposite reaction

- Law of Archimedes:

- Describes how far a floating body will sink



Variable - Something that changes in the experiment

Scientific Method -
Controls and Variables



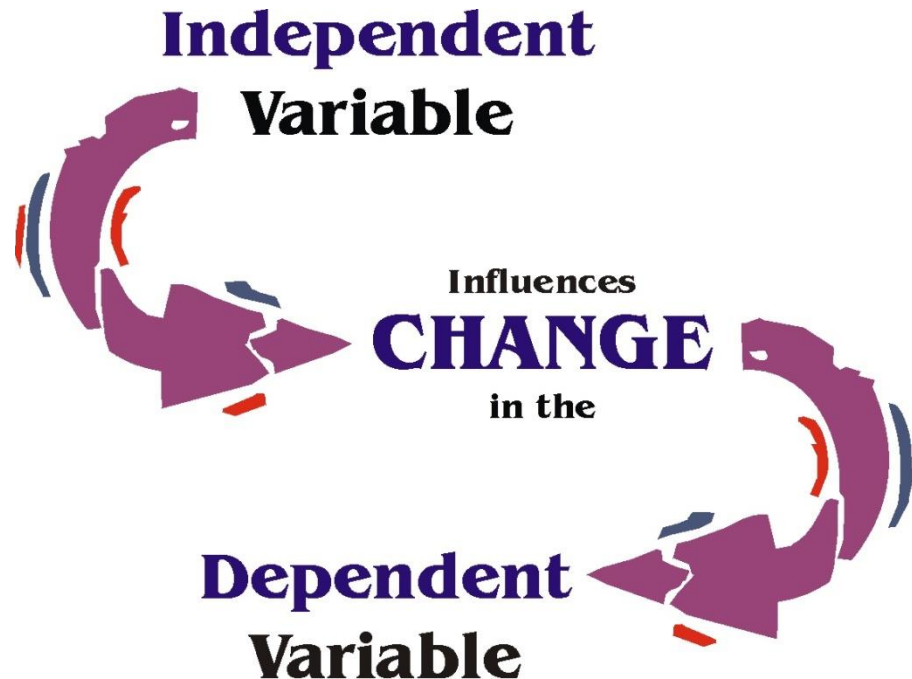
Variables

Independent

- Manipulated
- Controlled by the experimenter

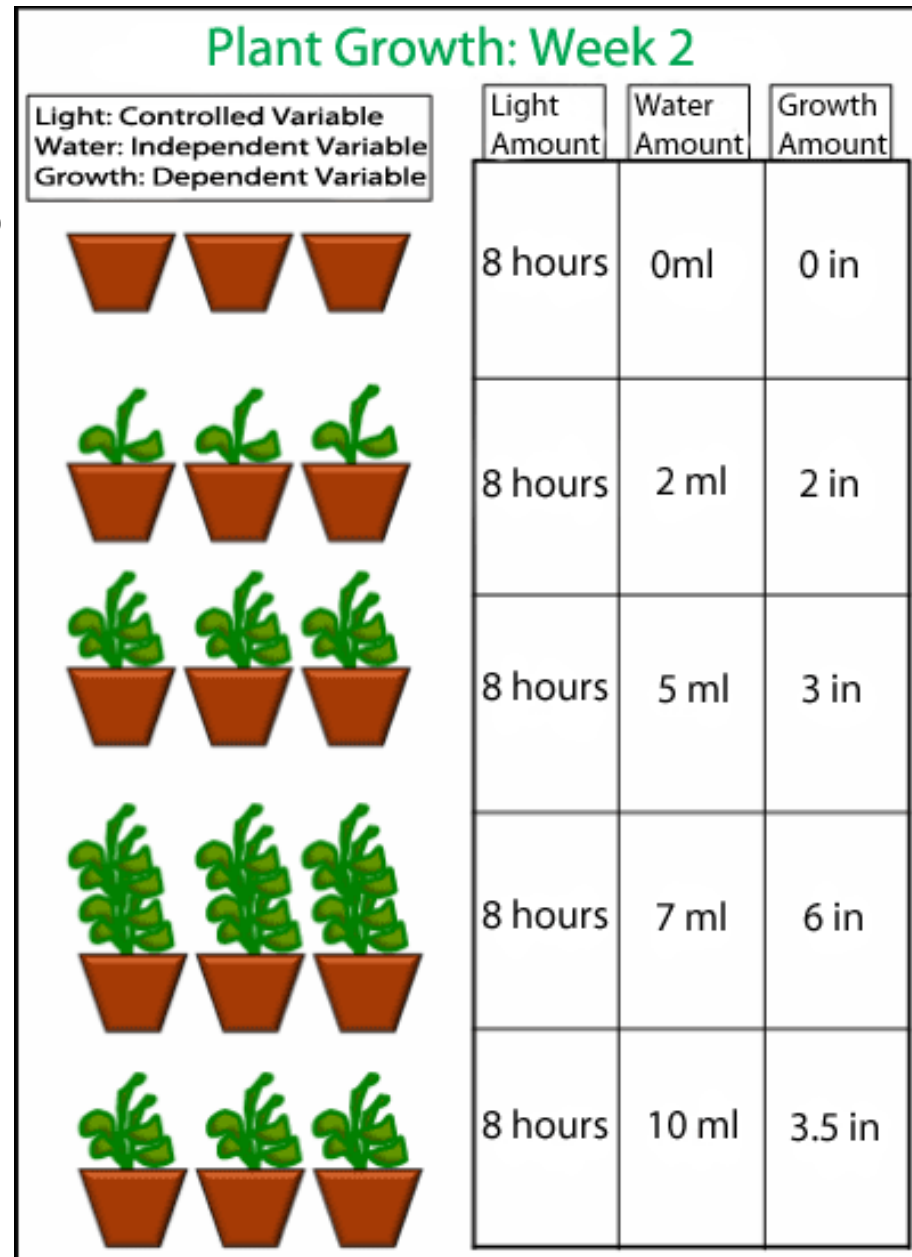
Dependent

- Reacts to changes in the independent variable
- What is observed



Controlled Variables

- Kept the same by the scientist



Observations

- Changes in the dependent variable that relate to the problem or hypothesis

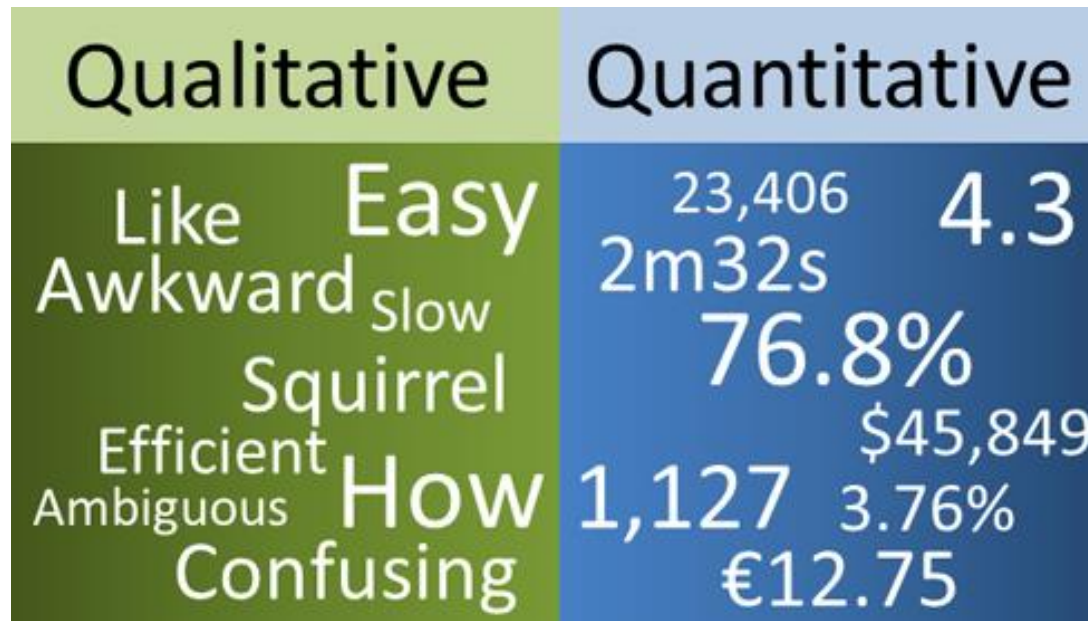
Observation

Qualitative

- Something that is described in WORDS
- What is seen, heard, felt, smelt or tasted

Quantitative

- Measured, counted
- Involves NUMBERS
- Ex: length, mass, volume, density



The Scientific Method

- An orderly method used in scientific research
- How scientists design experiments



Scientific Method Parts

- Problem
- Hypothesis
- Materials
- Procedure
- Results
- Conclusion



Problem

- The problem you are **trying to solve** or the question you are **trying to answer**
- **Not a yes or no question**
- Explores a relationship between 2 variables



Hypothesis

- What you think the answer to the problem is
- **Testable prediction**
- If...then...
- Ex: **If** the object has less mass, **then** the object will go farther.



Materials

- All of the equipment necessary to perform the experiment



Procedure

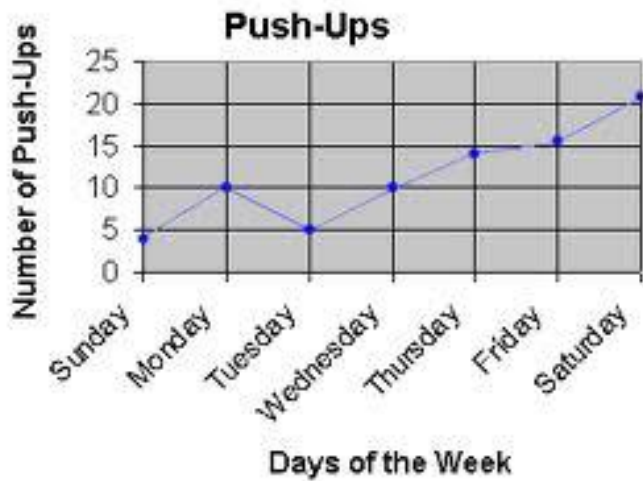
- The steps for testing the hypothesis
- Directions to do the experiment
 - List
 - Numbered steps
 - In order



Results

QuaNtitative

- Graph
- Charts



Qualitative

- Text

Conclusion

- Summary of the experiment
- What was learned from the experiment
- Was the hypothesis supported?
- Provide evidence (why)
- How could the experiment be improved?
- How could this information be used?
 - Real world application
 - Further experiments