Tuesday
8.22.17

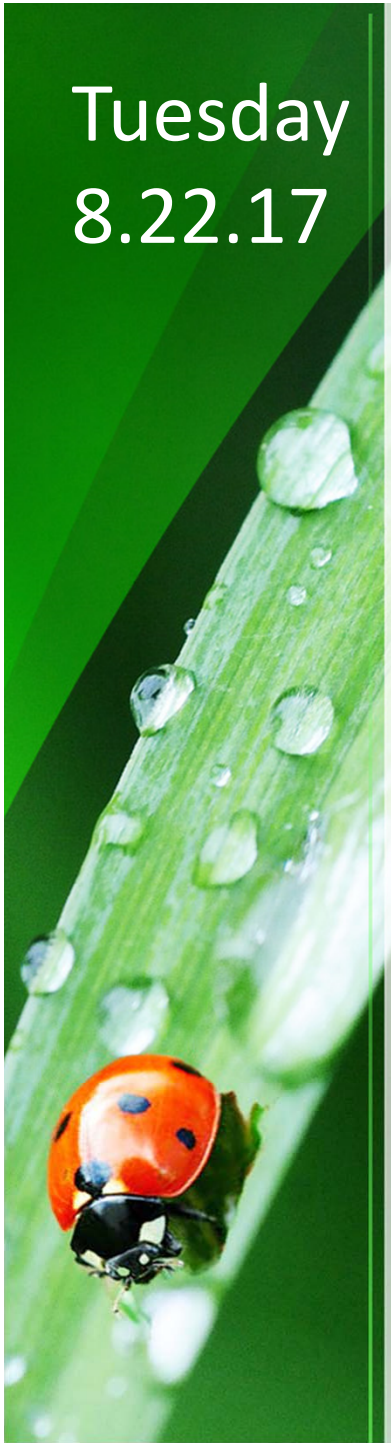
Today you will…

- Begin the M&M Lab

Mythbusters Experiment

Independent and Dependent Variable -
https://www.youtube.com/watch?v=nqj0rJEf3Ew

Controlled Experiment -
https://www.youtube.com/watch?v=D3ZB2RTylR4



◆Make sure your PHONES are in your bags unless given permission to have them out!

How do earth scientists determine the causes of natural events?

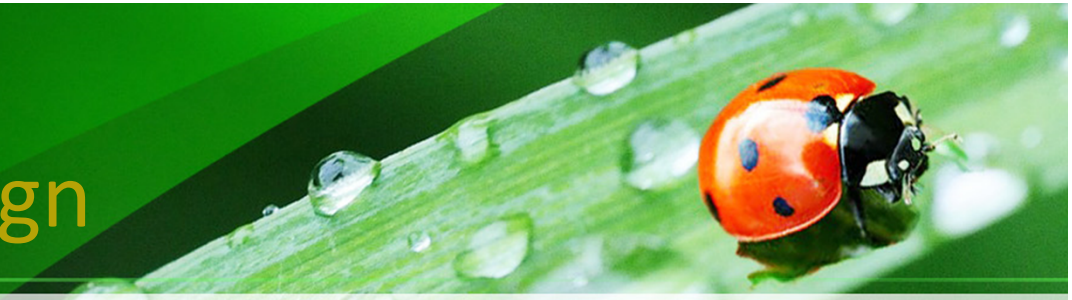
- Earth scientists assume that the causes of natural events or phenomena can be determined by careful observation and experimentation.

Investigations are used to answer questions

- **Scientific investigation** is the way in which **scientists** and researchers use a systematic approach to answer questions about the world around us.

- Empirical evidence is information that is acquired by observation, experimentation, or investigations. This evidence is used to inform society's decision making. For example, evidence in polar ice caps have informed scientists that the Earth is warmer today than in the past (co2 levels).

Experimental Design



Hypothesis – Testable idea or explanation that leads to scientific investigation.

All experimental designs must have an independent variable, a dependent variable, and a control group.

Independent variable – Factor manipulated in an experiment. The "if" part of the hypothesis.

Dependent variable – Factor that changes because of the independent variable. The "then" part of the hypothesis.

Control group – Test group not subjected to the independent variable. "Normal conditions"

For Example

Example: What effect does blue light have on plant growth?

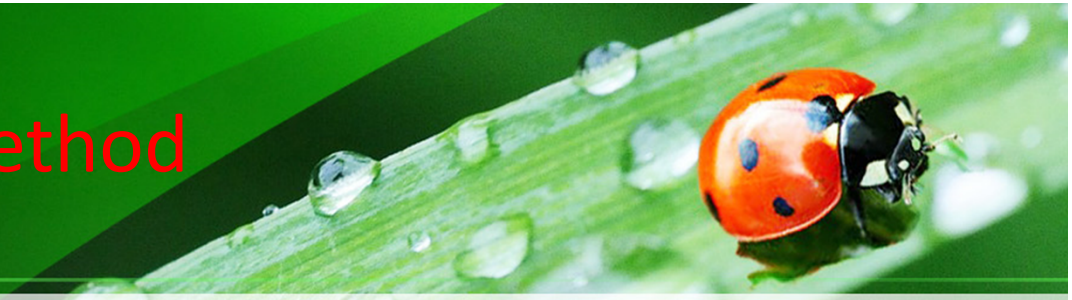
Hypothesis?

Independent variable?

Dependent variable?

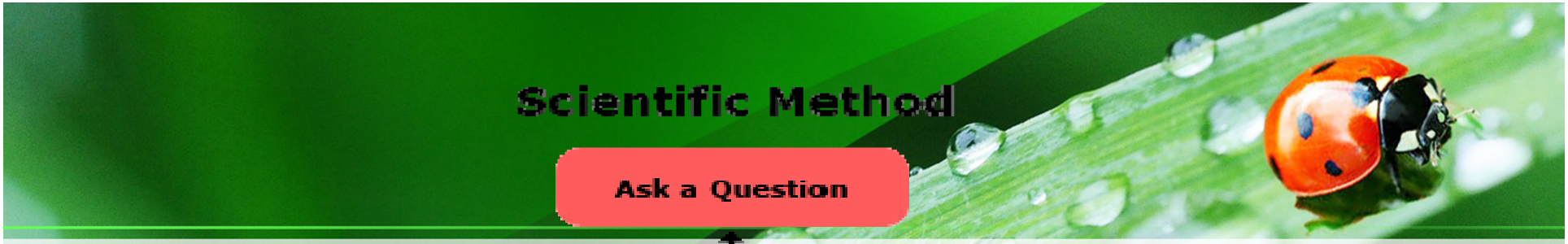
Control group?

Steps of scientific method



1. question/problem/purpose
2. Background research
3. Hypothesis (if…then…)
4. Design experiment
5. Do the experiment
6. Collect data
7. Results
8. Conclusion
9. communication

Scientific Method



How is an investigation's reliability and validity?

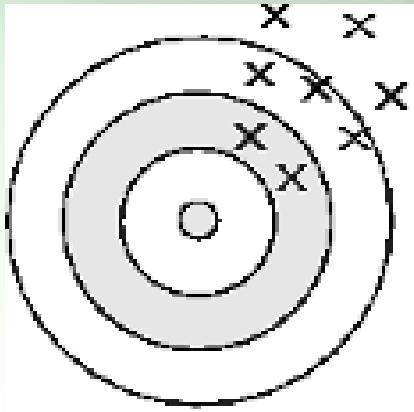
Reliability – The same results will happen during a different experiment. Experiments should be repeated over many times or many test samples should be used.

Validity – the measure of how accurate AND precise an experiment is.

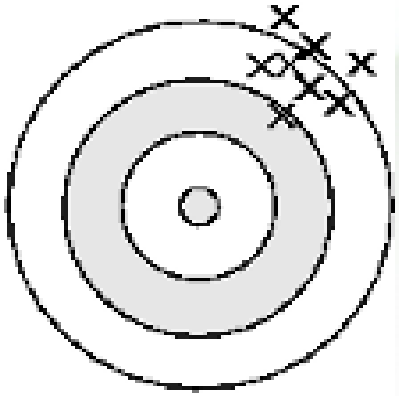
Accuracy – How close a measurement is to the true value.

Precision – how exact a measurement is.

Precision and accuracy



Not precise
Not accurate



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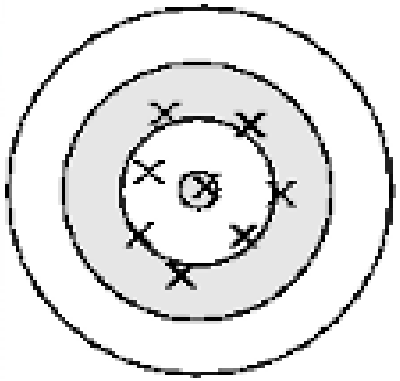

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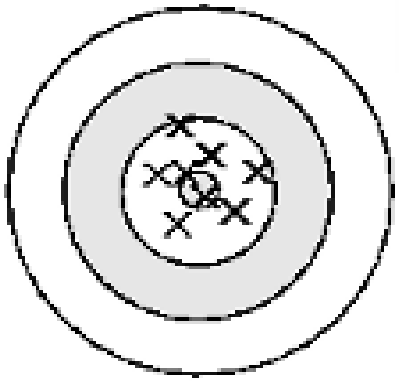

Precise
Accurate