WHOOOA BIG SAFETY ISSUE!

Scientific Method

Overview of the Scientific Method

The scientific method is a process for experimentation that is used to explore observations and answer questions. Scientists use the scientific method to search for **cause and effect** relationships in nature. In other words, they design an experiment so that changes to one item cause something else to vary in a predictable way.

Just as it does for a professional scientist, the scientific method will help you to understand what makes a scientific experimental inquiry valid.

But first let us review the steps of the Sci. Meth.

“Complete supportive class notes”

- See worksheet (Scientific Method notes outline)

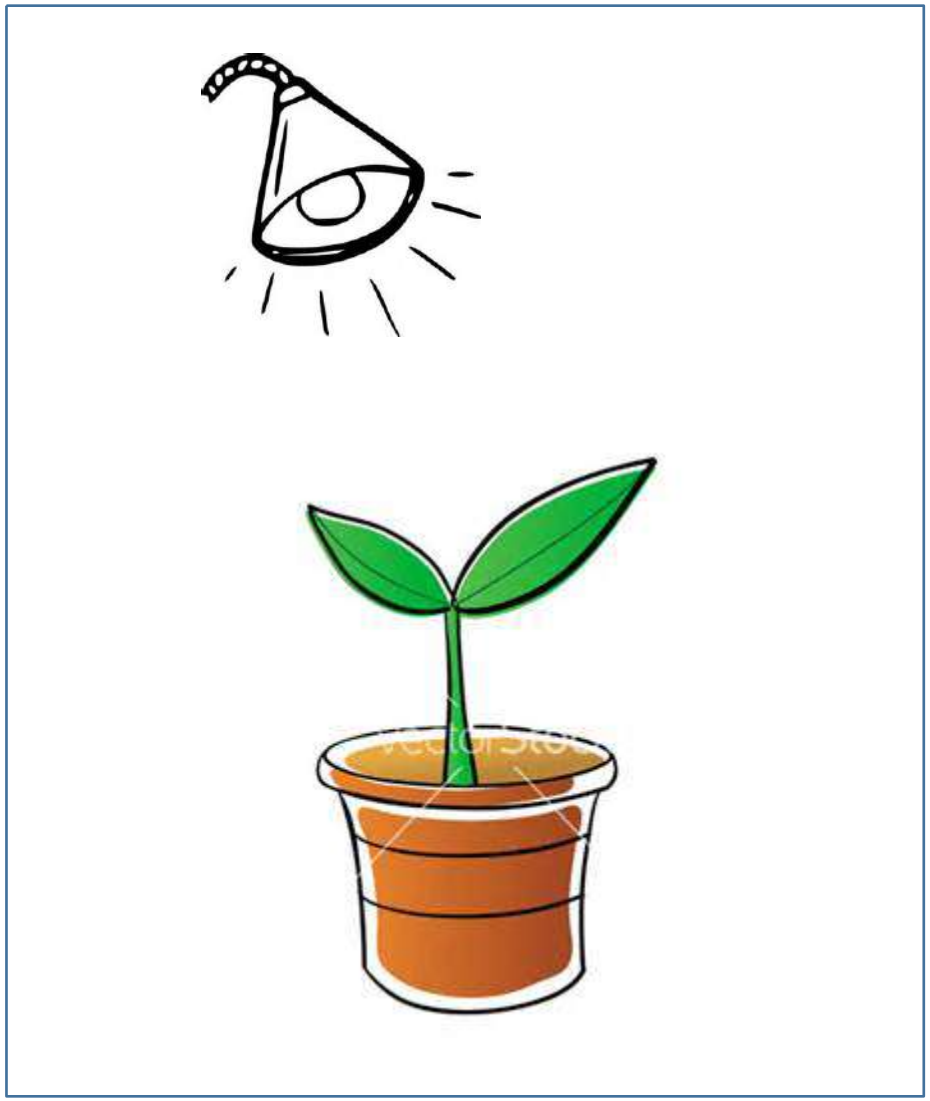

Ask Question
Do Background Research
Construct Hypothesis
Think! Try Again
Test with an Experiment
Collect and Record Data
Analyze Results Draw Conclusion
Hypothesis Is *True*
Hypothesis Is *False* or Partially True
Report Results

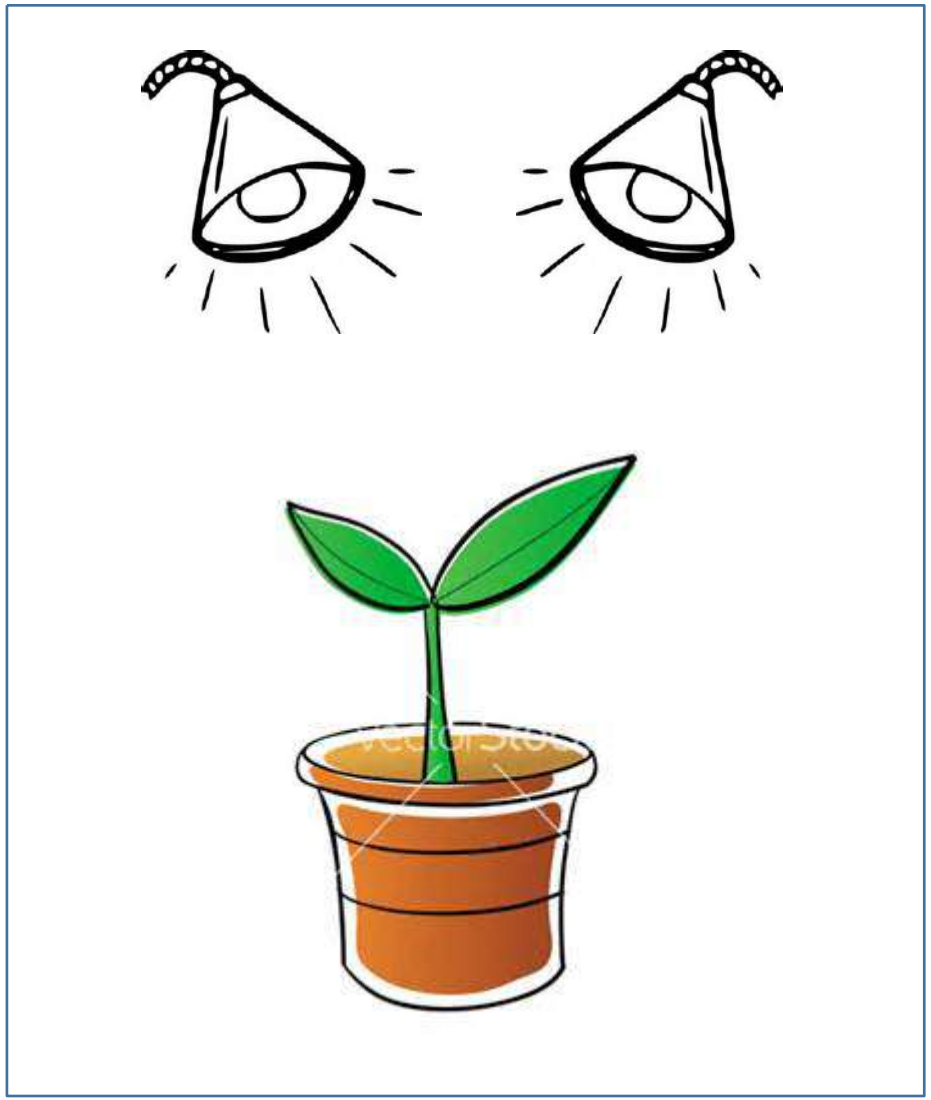
Quizlet link - find this link on my website for prep this week. Go on website, play with quizlet then print evidence of review / study before Friday

https://quizlet.com/3011541/the-scientific-method-and-parts-of-an-experiment-flash-cards/

label the experimental plant diagram on attached WS

Consider the following experiment. **If** we had twice the amount of light **then** the pea plants will grow twice as tall.





Hypothesis (*Noun)*

a proposed scientific explanation made on the basis of evidence and reasoning, that serves as a starting point for further investigation or experimentation.

synonyms:

theory, theorem, thesis, supposition, postulation, postulate, proposition, premise, assumption

Writing/forming a hypotheses:

- Do not write “I think” or “I believe”...ever. You might use the word “predict.”

Use **if**….**then**….because. You convey cause and effect.

If we had twice the amount of light **then** the pea plants will grow twice as tall.

- It is an educated guess essentially about the outcome of a study (experiment)

HOW TO MAKE /WRITE A HYPOTHESIS

- “If this occurs …… then this will …….. because……..”

  (alternatively you might write)

_____

_____

_____

_____

_____ (write your hypoth. here)

Scientific Method

For experiment to valid within the confines of the sci. meth. then it must the _____

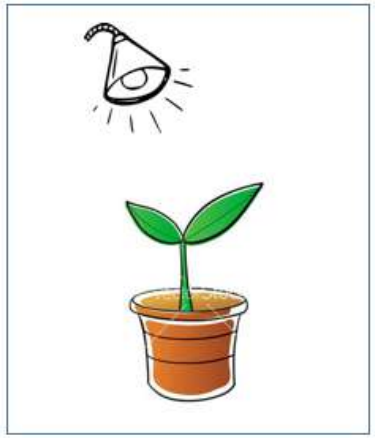
Identifying Variables: 5 parts - know

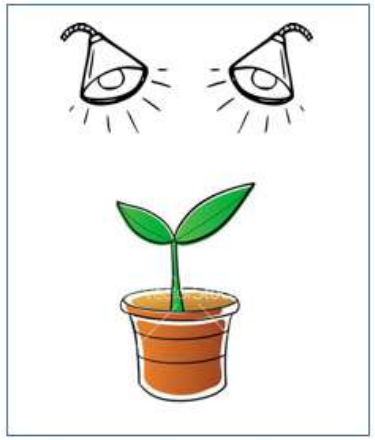
IV, DV, Control Group, Experimental Group, Constants

IV – Independent Variable

Define the IV:

IV : Independent Variable



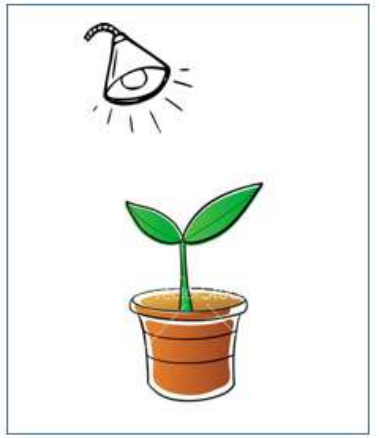


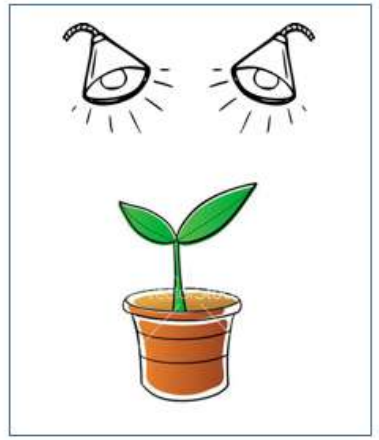
How to identify the IV:

DV – Dependent Variable

Define the DV : _____

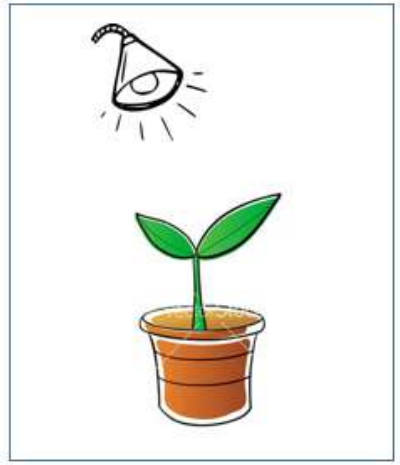
DV – Dependent Variable





How to identify the DV:

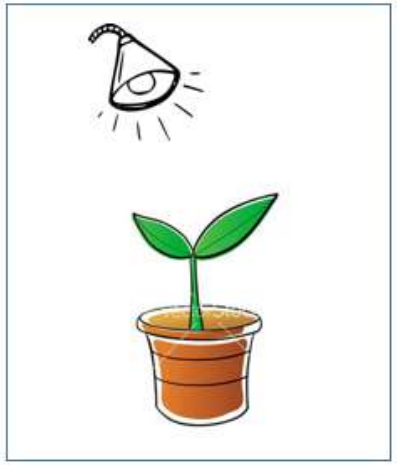
Control Group

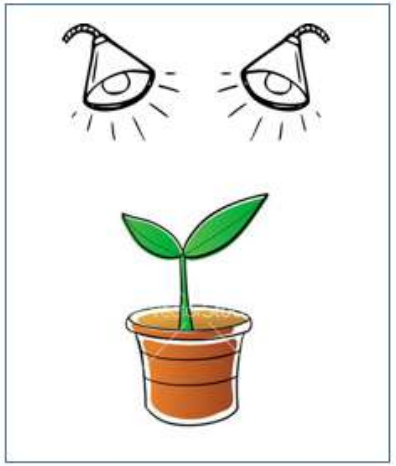


Definition: this is the group which serves as the basis of comparison. It is the group which the scientists do not "experiment" with. Nothing is added and no changes are made.

How to identify the CG:

Experimental Group





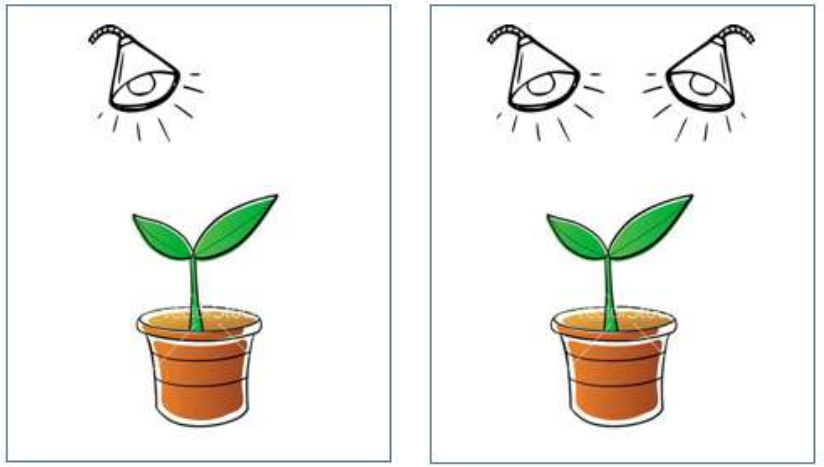
Definition: the group which contains the independent variable. Scientist changes something in this group to test their hypothesis.

How to identify the EG: _____

_____

_____

Constants



Definition: factors in an experiment that remain the same for both the experimental group and control group.

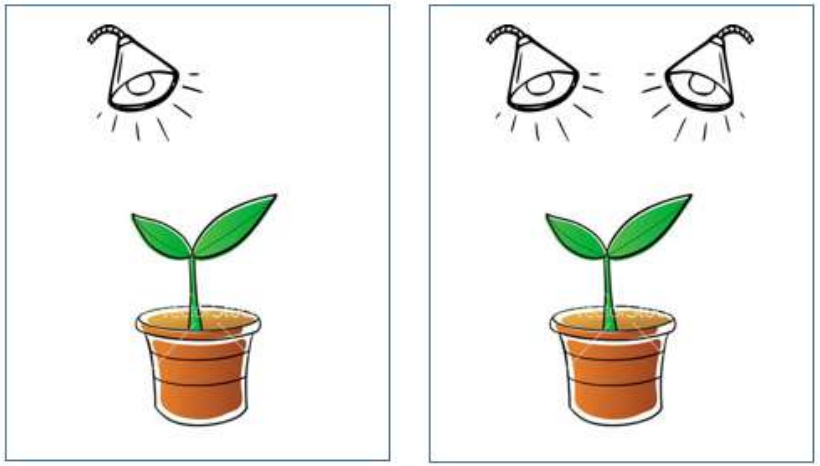
LIST : _____

_____

_____

The steps of the scientific method are to:

- **Ask a Question**
- **Do Background Research**
- **Construct a Hypothesis**
- **Test Your Hypothesis by Doing an Experiment**
- **Analyze Your Data and Draw a Conclusion**
- **Communicate Your Results**




Ask Question
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DO NOW: (1) brain storm list ideas

1. Example "experiment" for discussion: Imagine a pharmaceutical company wants to undertake an experimental study to see if their new drug is effective at reducing symptoms associated with the common cold. The company has an independent lab find a significant sample size of 50 individuals with varying backgrounds in various geographic locations during the cold season that have reported feeling ill and give them all the new drug. They clinically evaluate the candidates later and then report their findings.

What is the major outlining **issue** *(problem)* with this study? _____

Brainstorm list ideas (discuss w/ peers)

Scientific Method Flow Chart SPINNER EXAMPLE

Word bank:	Analyze/ conclude	Hypothesis True	Hypothesis False	Retest
Research	Collect data	Report Results	Form Hypothesis	
Ask a question	Run Experiment