



Brain Storm



- 1) What words, pictures or stories do you associate with the word "Science"?
- 2) What does science mean to you?
- 3) What do you remember from previous science classes? (List them)

First do this on your own



What is a scientist (Draw a picture, color it and set it aside)

What does diversity of life mean to you? (Draw a picture on a different piece of paper)

↓
Bunch of different Stuff of Life

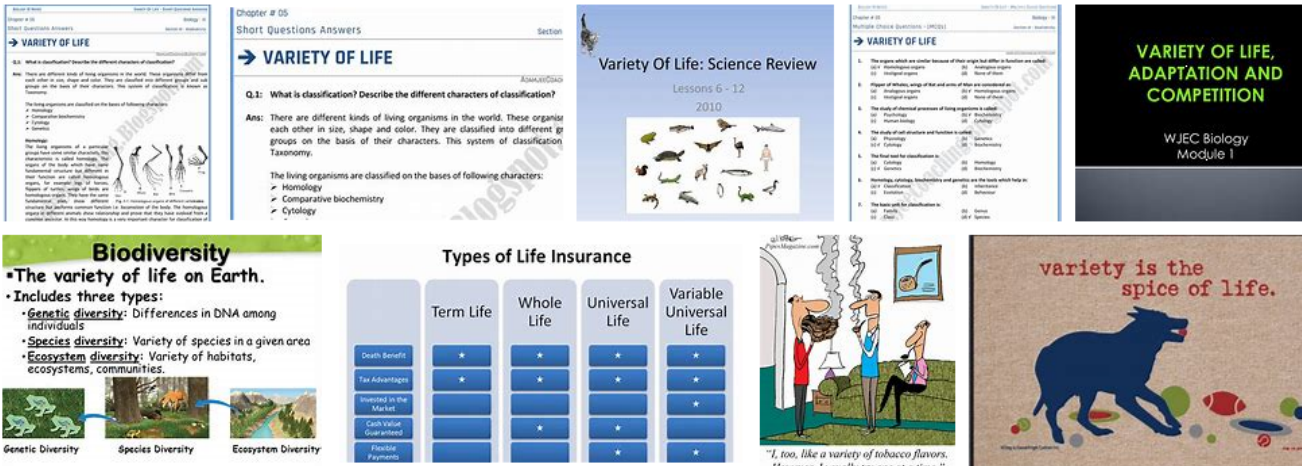
'Variety of Living things'

This is a google search for "Scientist"

What do you notice?



This is a google search for "Variety of Life"





Look closely at the crime scene.

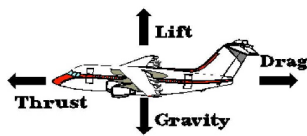
We have one eye witness that has seen the following:

-a male running from the scene but got into car at the corner.

You are the investigator of this crime. Think of questions to ask and who would you ask?


Let's write this out in detail

Grade⁶Science

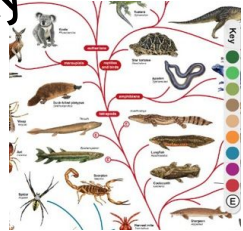


Flight

Science Inquiry

<p>make an observation</p> 	<p>ask a question</p> 
<p>make a hypothesis</p> <p>I think...</p> 	<p>conduct your experiment</p> 
<p>draw conclusions</p> <p>I learned that...</p> 	<p>report your results</p> 

Variety of Life



Review Scientific Method



Has 7 steps

1) Ask a **Question** (It must be **Testable**)

-Include "Which", "Do/Does", "How", "What", "Why"?

-To find an answer you must do a test and the retest

2) Make a **Hypothesis** - Write what you think you will find out, and why you think this.(or what you think the answer will be). Is there a way to test your hypothesis.

-You now have to design an experiment to test your hypothesis

3) **Design an Experiment** - what are you going to do to test your hypothesis. Here you must state the variables. (SEE NEXT PAGE)

4) **List Materials** - list all the materials that you will use in the investigation

5) **Procedure** - Carry out the investigation and make a detailed list of steps in which you followed .

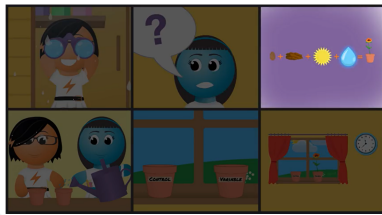
6) **Results/observations** - Record what you observed when you carried out the investigation/procedures


7a) **Conclusion** - From what you observed how would you answer your original question. Was your hypothesis correct? Give reasons of why or why not.

Once you have completed the scientific method you must:


7b) -**Communicate** your results and conclusions with others

- If possible, **relate** what you have learned to the world outside the classroom.



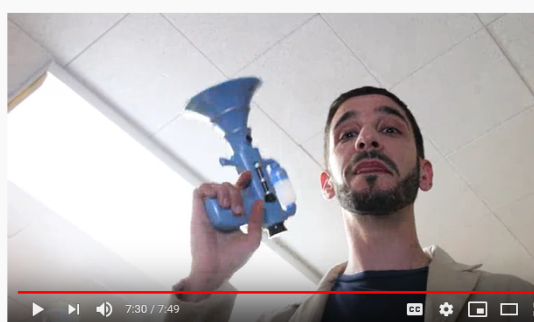
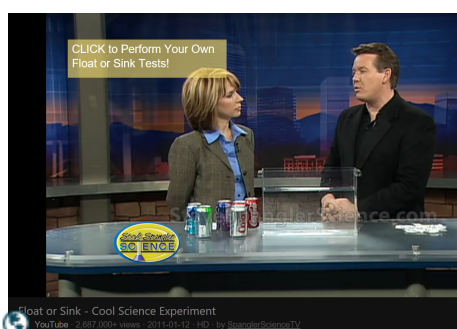
 Scientific Method Song



 the discovery of penicillin (1964)

Discovery of Penicillian (Sharing Information)

Let's see an experiment
Pause as we go



<https://www.youtube.com/watch?v=NmNpzteP434>



Variables in Science Experiments

A **variable** is any factor, trait, or condition that can exist in differing amounts or types.

An experiment usually has **three kinds of variables**:

1) **independent**, 2) **dependent**, and 3) **controlled**.

1) **Independent variable** is the *one* that is changed by the scientist.

Why just one? Well, **if you changed more than one variable it would be hard to figure out which change is causing what you observe.**



For example, what if our scientific question was: "How does the size of a dog affect how much food it eats?"; then, during your feeding experiments you changed both the size of the dog and the time of day the dogs were fed. The data might get a bit confusing — did the larger dog eat less food than the smaller dog because of his size or because it was the middle of the day and dogs prefer to eat more in the morning? Sometimes it is impossible to just change one variable, and in those cases, scientists rely on more-complicated mathematical analysis and additional experiments to try to figure out what is going on.

2) **Dependent variables** are the things that the scientist focuses his or her observations on to see how they respond to the change made to the independent variable.

In our dog example, the dependent variable is how much the dogs eat. This is what we are observing and measuring. It is called the "dependent" variable because we are trying to figure out whether its value depends on the value of the independent variable. If there is a direct link between the two types of variables (independent and dependent) then you may be uncovering a cause and effect relationship. The number of dependent variables in an experiment varies, but there can be more than one.



3) **Controlled variables** are quantities that a scientist wants to remain constant, and must observe them as carefully as the dependent variables.



For example, in the dog experiment example, you would need to control how hungry the dogs are at the start of the experiment, the type of food you are feeding them, and whether the food was a type that they liked. Why? If you did not, then other explanations could be given for differences you observe in how much they eat. For instance, maybe the little dog eats more because it is hungrier that day, maybe the big dog does not like the dog food offered, or maybe all dogs will eat more wet dog food than dry dog food. So, you should keep all the other variables the same (you control them) so that you can see only the effect of the one variable (the independent variable) that you are trying to test. Similar to our example, most experiments have more than one controlled variable. Some people refer to controlled variables as "constant variables."




In the best experiments, the scientist must be able to measure the values for each variable.


Example) Weight or mass is very easy to measure.

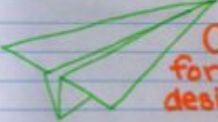
However, love cannot be measured.




Variables

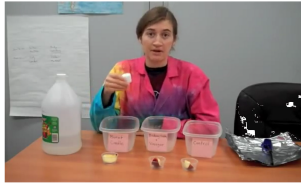
 Independent:
size of paper

 Dependent:
distance the plane flies

 Controlled:
force of throw,
design, paper type

Independent	Dependent	Controlled
<ul style="list-style-type: none">what is being testedthe thing in an experiment that is changed	<ul style="list-style-type: none">resultchanges based on the independent variable	<ul style="list-style-type: none">things we keep the same





Apple Oxidation & The Scientific Method: a fun, at home science experiment

Let's use the scientific method and write it out as she goes.

→ 1 Question →

→ 2 hypothesis → guess what happens and why

→ 3 materials (list)

4) Design Experiment → ^{Done} girl did this
Procedure

Observation

7) a) Conclusion

7) b) ^{Communication} Video on youtube



Apple Oxidation & The Scientific Method: a fun, at home science experiment

Let's use the scientific method and write it out as she goes.

- ¹ Question → What will happen to an apple if i remove the oxygen?
 → ² hypothesis → guess what happens and why

If I remove oxygen from around the apple it should stay fresh because from my previous experiment we discovered that apples turned brown when exposed to oxygen.

- ³ materials (1st)
 → 3 plastic dishes → Spoon
 → lighter → mini-cup
 → 3 slices of apples
 → tin foil
 → baking soda
 → Vinegar
 → candle

4) Design Experiment → ^{Done} girl did this
 Procedure

- Labeled container 1 with burnt candle. Light a candle and place it inside the container. Place 1 slice of apple in this container. Put 1 piece of tin foil over container 1.
- In the 2nd container add 1 cup of Vinegar and 2 teaspoons of baking soda, allow to bubble for about 30 sec. Place the apple within a minicup inside the container 2. Cover with tin foil.
- In container 3, place the apple inside and cover it with tin foil.

↳ control container

wait 7 hours

Observation

- Burnt candle → not the brownish but browner than
- Vinegar + Baking Soda → brown the most around edges
- Control → lightest in color (surprized!)

7) a) Conclusion

Our hypothesis was wrong because even with trying to remove oxygen with CO₂ (burnt candle and Vinegar mixture) the apple turned brown.

7) b) ^{Communication} Video on youtube



Episode 01 - Mentos & Diet Coke (Scientific Method Example)

23 min just interesting
more advanced



2min

Diet Coke & Mentos | MythBusters
730,891 views 12K 1K SHARE SAVE ...

https://www.youtube.com/user/scienceoffcenter/videos?diabile_polymer=1

1. In scientific experiments dependent variables should be: (25 points)

- changed on purpose by the experimenter.
- measured and observed.
- held constant.
- none of the above.

2. In scientific experiments the independent variable should be: (25 points)

- chosen by another, independent scientist.
- held constant.
- changed on purpose by the experimenter.
- ignored.

3. Mark whether each of the following factors is a good choice or bad choice for an independent variable:

Time (5 points)

Height (5 points)

Sadness (5 points)

Where someone was born (5 points)

Whether it is night or day (5 points)

4. The variables you keep the same throughout an experiment are called the: (25 points)

- controlled variables.
- observational variables.
- independent variables.
- dependent variables.
- measured variables.

5. For her science fair project, Maya asks the following question: "I see that some recipes for bubble blowing solution have glycerin and others do not. I want to blow the largest bubbles possible. How does adding glycerin to my bubble blowing solution change the size of the bubbles I can blow with it?" From the list below, mark which variables Maya can ignore as unimportant during her experiment, which variables she needs to try to change during her experiment, and which variables she needs to try to keep the same during her experiment:

The brand of dish detergent used to make the bubble blowing solution (5 points)

The size of her bubble wand (5 points)

The amount of glycerin added to the bubble blowing solution (5 points)

The weather conditions outside when blowing bubbles (5 points)

Whether or not her neighbor's dog is barking (5 points)



21 minutes



6 min 28sec

Science Project Video Using Scientific Method:
Amazing Floating Egg by Mr. Plattner



Scientific Method Applied to the Action of Bleach on Food Coloring

Let's list the scientific method as he goes

In groups of 2 or 3 you will do a project involving the scientific method that you will write up and demonstrate to the class.

Computer lab to research tomorrow

Attachments

Unit 1 Space Test Outline.notebook