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.

https://www.youtube.com/watch?v=qAJ8IF4HI20 Scientific method Brain POP Jr

https://www.youtube.com/watch?v=_3wzx2C6Bt8

https://www.youtube.com/watch?v=I63RB0fX2Xw Penny chemistry Experiment

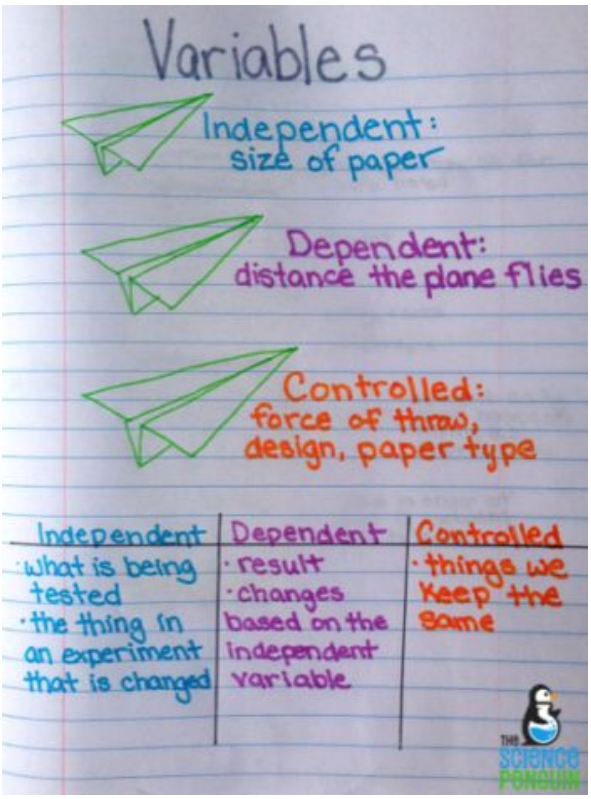
https://www.youtube.com/watch?v=UupDI4_pPlQ The corrosion Experiment

Variables in Science Experiments

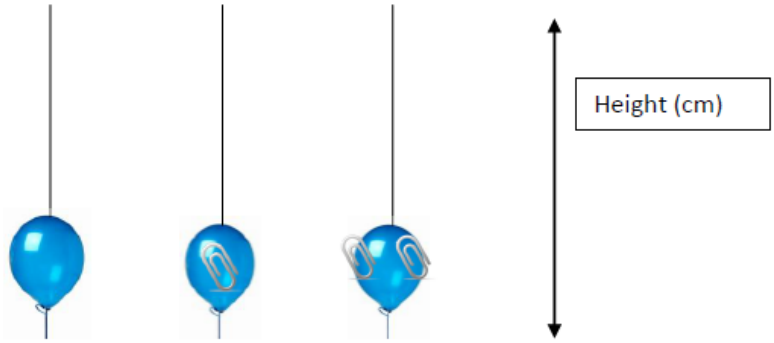
A **variable** is any factor, trait, or condition that can exist in differing amounts or types.

An experiment usually has three kinds of variables:

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



Jessica wants to know which balloon rocket will travel the farthest up the string given the scenarios below. Her question is: "How will the number of paper clips attached to a balloon rocket affect the height that each balloon rocket travels?"



0 paper clips 1 paper clip 2 paper clips

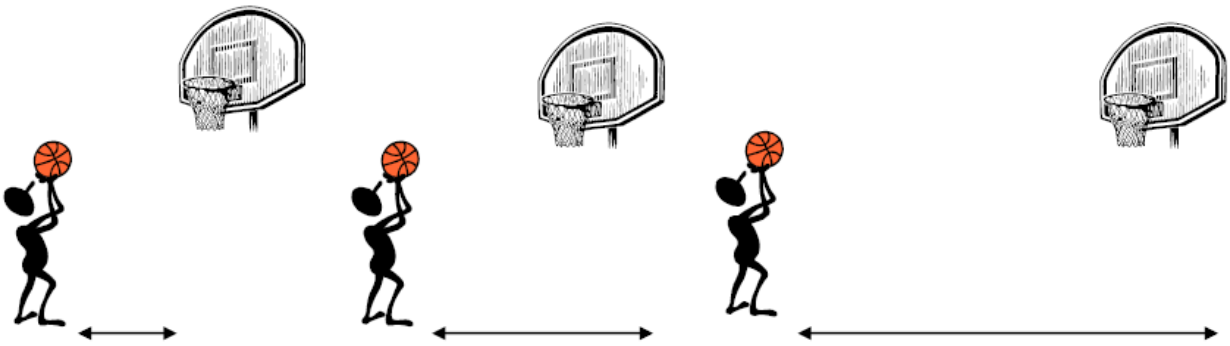
1)What information will she need to record in order to answer her question? (205-5)

a) Time until it takes for the balloon to reach the end of the string
b) Height travelled and time it takes to reach the end of the string
c) Number of paper clips added and height travelled
d) Size of balloon and height travelled

2)What does Jessica need to control to make sure that this is a fair test? (205-1)

a)The balloons should be different sizes.
b)The length of the strings should be the same.
c)She will need to use different size paper clips.
d)The speed of each balloon should be the same.

John recorded how many times he scored a basket at various locations during Monday's practice. He shot 10 times at each location. His results were as follows:



2m
3 Baskets made
out of 10

6m
5 Baskets made
out of 10

12m
0 Baskets made
out of 10

3)What variables should he include in his graph to show a clear picture of his results? (204-4)

a) Amount of Baskets Made and Distance
b) Amount of Baskets Made and Time
c) Amount of Attempts and Amount of Baskets
d) Amount of Attempts and Distance

4)John wants to investigate a similar topic next practice. What is a good follow-up question that he could test? (206-9)

a)How many laps can I run in 2 minutes?
b)How will distance affect the number of times that I catch a volleyball?
c)If I take 15 shots instead of 10 at each place, will my percentage of baskets increase?
d)If I shoot from half-court, then it will it go in.

5)Amy was using a flashlight to read her novel late last night. She thought it would emit brighter light than the light on h ercell phone. What does she need in order to test the brightness of each light source? (204-4)

a) Flash Light , Cell Phone and Bright Room
b) Flash Light , Cell Phone and Dark Room
c) Flash Light and Cell Phone
d) Flash Light , Cell Phone and Novel

6)A student added paper clips to a balloon rocket to investigate the effect of weight on the height of the balloon rocket. Based on the pattern in the data below, predict what the distance will be when 8 paper clips are added to the balloon. (204-3)

a) 10 cm
b) 35 cm
c) 40 cm
d) 50 cm

	Distance	Quantity of Paper Clips	Time
Balloon 1	195 cm	0	5 sec
Balloon 2	83 cm	2	3 sec
Balloon 3	35 cm	4	1 sec

7)Jack inflated a balloon and rubbed it on Sally's head. He noticed that his balloon stuck to the wall afterwards because of static electricity. He then rubbed the balloon on a desk and tried to stick it to the wall and the balloon fell to the floor. Based on these results, which conclusion statement is most accurate? (206-3)

a) The balloon stuck to the wall
b) When the balloon was rubbed, the hair generated less static electricity than the desk
c) The balloon stuck to the wall when rubbed against the desk
d) When the balloon was rubbed, the hair generated more static electricity than the desk

8) During one very long and snowy winter, the population of deer in an area decreased drastically due to lack of food and inability to escape predators. If the next winter brings similar conditions, predict what will most likely happen to the deer population. (204-3)

a) The population of deer in that area would increase.
b) The population of deer in that area would stay the same.
c) The population of deer in the area would decrease.
d) The population of rabbits would increase.

9) Jill wanted to see how much salt could be dissolved in water of different temperatures. She had four beakers of water that she filled from the tap as she counted to five. They were at different temperatures: $1℃$, $5℃$, $20℃$ and $32℃$. She put 2 tablespoons of salt in each beaker and each beaker was stirred at the same rate. Why was this not a fair test? (204-7)

a) The temperatures were the same.

b) She didn't measure the amount of water in each beaker.

c) She put different amounts of salt in each beaker.

d) She didn't stir all of the beakers.

10) An animal lives in an environment with the following characteristics:

- **Hot and dry**
- **Light brown sand covering the ground**
- **Very few water sources/very little rain**
- **Experiences extreme sand storms**
- **Very little plant life**

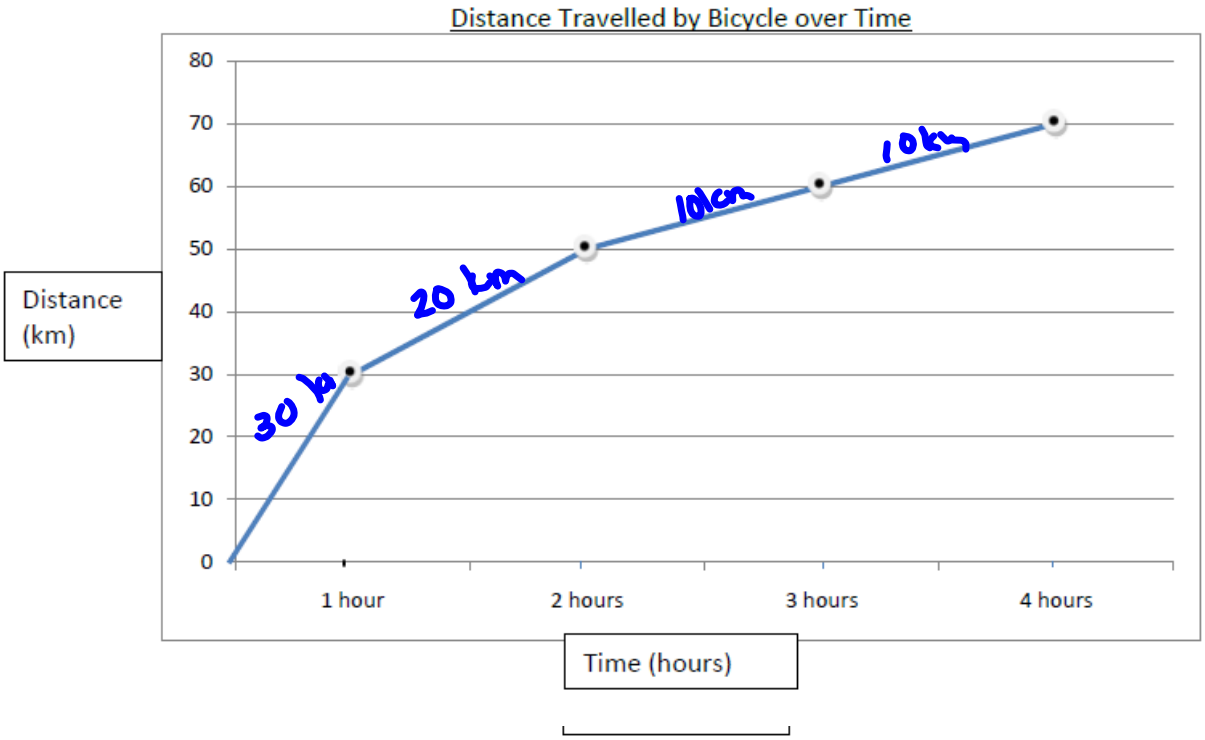
What question could the scientist ask if she wants to learn more about this animal? (204-3, 206-1)

a)What is the average temperature of the sand?
b)How long can the plants go without water?
c)How is the animal adapted for surviving in the rain-forest?
d)How long can the animal go without water?

11)Wild turkeys aren't normally found in NB, but now people are bringing them in and introducing them into the wild. Biologists believe they threaten native bird species because they are competing for food. What is the best way for a scientist to investigate this problem? (204-6)

a) Observe how the turkeys compete for food with other bird species for a day.
b) Observe the amount of turkeys humans eat.
c) Observe how the turkeys compete for food with other bird species over several months.
d) Immediately ban importation of wild turkeys.

A cyclist is travelling by bicycle over a period of 4 hours. Use the information below to answer the question(s).
(Note: **Speed = Distance / Time**)



12)Which conclusion describes the pattern observed in this graph? (206-3, 207-2)

a) Speed has no effect on the amount of distance travelled.
b) Decreased speed causes an increase in the amount of distance travelled.
c) Increased speed causes a decrease in the amount of distance travelled.
d) Decreased speed causes a decrease in the amount of distance travelled.

13)Which statement is true about the data above? (206-3, 207-2)

a)The cyclist travelled the same distance each hour.
b)The cyclist travelled half of the total distance in the first hour, then slowed down.
c)The cyclist travelled 10 km in the last hour.
d)The cyclist travelled 50 km between the first hour and the second hour.

14)The cyclist decides to make a change to the bicycle. Which change to the bicycle would most likely cause increased speed? (206-6)

a)The cyclist changes from water to energy drinks.
b)The cyclist modifies the bicycle to make it lighter.
c)The cyclist upgrades the breaking system.
d)The cyclist takes a different path.