STATION 2

Independent & Dependent Variables

In scientific experiments there are 2 variables. One that YOU control and one that is the result.

Variable – something in the experiment that is changed

1. Independent (manipulated) variable – 'The Cause'

   The one thing that YOU change in an experiment. On a graph it is on the X-axis.

2. Dependent (responding) variable – 'The Effect'

   The result of the experiment, what YOU measure. It 'depends' on what YOU changed.

   On a graph, it is on the Y-axis.

The <u>independent variable</u> causes the <u>dependent variable</u> to change!

Homer notices that his shower is covered in a strange green slime. His friend Barney tells him that coconut juice will get rid of the green slime. Homer decides to test this out by spraying half of the shower with coconut juice. He sprays the other half of the shower with water. After 3 days of "treatment" there is no change in the appearance of the green slime on either side of the shower. 	1. What was the initial observation? Identify the - 2. Control Group 3. Independent (Manipulated) Variable 4. Dependent (Responding) Variable 5. What should Homer's conclusion be?

STATION 2

Smithers thinks that a special juice will increase the productivity of workers. He creates two groups of 50 workers and assigns each group the same task (in this case, they're supposed to staple a set of papers). Group A is given the special juice to drink while they work. Group B is not given the special juice. After an hour, Smithers counts how many stacks of papers each group has made. Group A made 1,500 stacks. Group B made 2,000 stacks.

Identify the -

6. Control Group

7. Independent (Manipulated) Variable

8. Dependent (Responding) Variable

9. What should Smithers conclusion be?

10. How could this experiment be improved upon?

Lisa is working on a science project. Her task is to answer the question: "Does Rogooti (which is a commercial hair product) affect the speed of hair growth?" Her family is willing to volunteer for the experiment.

11. Describe how Lisa would perform this experiment. Identify the control group, and the independent and dependent variables in your description.

STATION 3

Independent & Dependent Variables

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2. Dependent (responding) variable – 'The Effect'

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The <u>independent variable</u> causes the <u>dependent variable</u> to change!

How Penicillin, an Antibiotic, Was Discovered

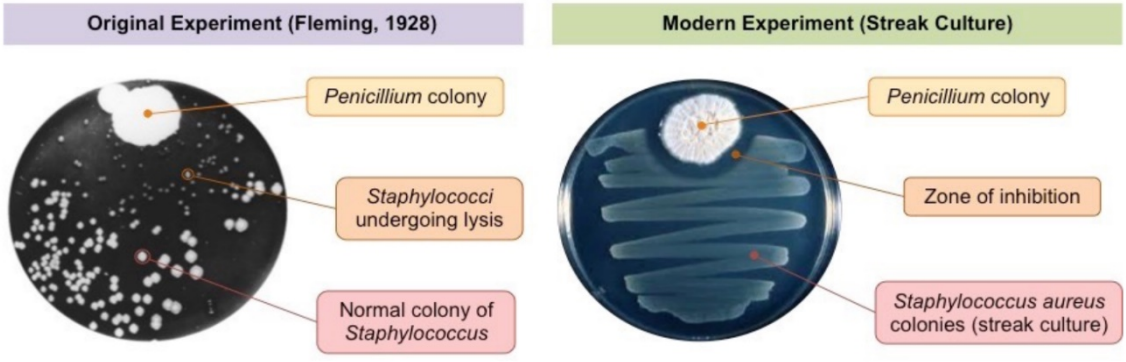
In 1928, Sir Alexander Fleming was studying Staphylococcus bacteria growing in culture dishes. He noticed that a mold called Penicillium was also growing in some of the dishes. A clear area existed around the mold because all the bacteria that had grown in this area had died. In the culture dishes without the mold, NO clear areas were present.
Fleming hypothesized that the mold must be producing a chemical that killed the bacteria. He decided to isolate this substance and test it to see if it would kill bacteria. Fleming transferred the mold to a nutrient broth solution. This solution contained all the materials the mold needed to grow. After the mold grew, he removed it from the nutrient broth and then added the broth to a culture of bacteria. He observed that the bacteria in the culture died. Fleming's experiments were later used to develop antibiotics.

1. State the question or problem that Fleming investigated.

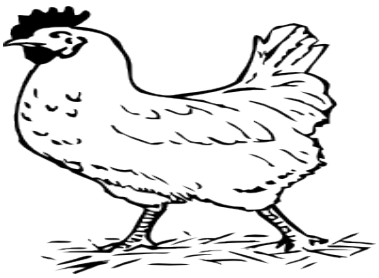
2. What was Fleming's hypothesis?

3. How was the hypothesis tested?

4. This experiment lead to the development of what major medical advancement?



The Strange Case of Beriberi



In 1887 a strange nerve disease attacked the people in the Dutch East Indies. The disease was beriberi. Symptoms of the disease included weakness and loss of appetite, victims often died of heart failure. Scientists thought the disease might be caused by bacteria. They injected chickens with bacteria from the blood of patients with beriberi. The injected chickens became sick. However, so did a group of chickens that were ***not*** *injected with bacteria.*
One of the scientists, Dr. Eijkman, designed a new experiment based on his own observations. Before the experiment, all the chickens had eaten whole-grain rice, but during the experiment, the chickens were fed polished white rice. Dr. Eijkman researched this interesting case and found that polished white rice lacked thiamine, a vitamin necessary for good health.

5. State the question or problem that Dr. Eijkman investigated.

6. What was the original hypothesis (if-then statement)?

7. What was the independent (manipulated) variable and the dependent (responding) variable?

8. Write a statement that summarizes the results of the experiment.

9. Was the hypothesis proven to be true or false?

10. How would Dr. Eijkman test his new hypothesis?