

Name:

Period:

Date:

## Case Study

### Controlled Experiments:

- A \_\_\_\_\_ is a scientific investigation that tests how one factor affects another.
- A \_\_\_\_\_ is any factor that can have more than one value.
- The \_\_\_\_\_ is the factor that you want to test. It is changed by the \_\_\_\_\_.
- The \_\_\_\_\_ is the factor you observe or \_\_\_\_\_ during the experiment.
- \_\_\_\_\_ are the factors in an experiment that do not change.
- A controlled experiment usually has at least two groups: the \_\_\_\_\_ group and the \_\_\_\_\_ group.
- The \_\_\_\_\_ is used to study how a change in the independent variable changes the dependent variable.
- The \_\_\_\_\_ contains the same factors as the experimental group, but the \_\_\_\_\_ variable is not changed.

### Asking Questions:

- \_\_\_\_\_ data use \_\_\_\_\_ to describe what is observed.
- \_\_\_\_\_ data use \_\_\_\_\_ to describe what is observed.

## Identify the Controls and Variables



Smithers thinks that a special juice will increase the productivity of workers. He creates two groups of 50 workers each 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 1,587 stacks, Group B made 2,113 stacks.

Identify the:

1. Control Group
2. Independent Variable
3. Dependent Variable
4. What should Smithers' conclusion be?
5. How could this experiment be improved?
6. What was the overall problem?



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 check 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 and the problem?

Identify the-

2. Control Group
3. Independent Variable
4. Dependent Variable
5. What should Homer's conclusion be?

### Squidward's Symphony

Squidward loves playing his clarinet and believes it attracts more jellyfish than any other instrument he has played. In order to test his hypothesis, Squidward played a song on his clarinet for a total of 5 minutes and counted the number of jellyfish he saw in his front yard. He played the song a total of 3 times on his clarinet and repeated the experiment using a flute and a guitar. He also recorded the number of jellyfish he observed when he was not playing an instrument. The results are shown in the chart.

Number of Jellyfish/Instrument

Trial	No Music	Clarinet	Flute	Guitar
1	5	15	5	12
2	3	10	8	18
3	2	12	9	7

10. What is the independent variable?
11. What is the dependent variable?
12. What should Squidward's conclusion be?
13. Are the results reliable? Why or why not?

### Super Bubbles

Patrick and SpongeBob love to blow bubbles! Patrick found some Super Bubble Soap at Sail-Mart. The ads claim that Super Bubble Soap will produce bubbles that are twice as big as bubbles made with regular bubble soap. Patrick and SpongeBob made up two samples of bubble solution. One sample was made with 5 oz. of Super Bubble Soap and 5 oz. of water, while the other was made with the same amount of water and 5 oz. of regular bubble soap. Patrick and SpongeBob used their favorite bubble wands to blow 10 different bubbles and did their best to measure the diameter of each one. The results are shown in the chart

Bubbles  
(Diameter in centimeters)

Bubble	Super Bubble	Regular Soap
1	15	10
2	10	5
3	12	16
4	18	14
5	22	11
6	13	12
7	16	11
8	18	15
9	15	15
10	12	6

14. What did the Super Bubble ads claim?
15. What is the independent variable?
16. What is the dependent variable?
17. Look at the results in the chart.
  - a. Calculate the average diameter for each bubble solution.

Super Bubble = \_\_\_\_\_ cm Regular Soap = \_\_\_\_\_ cm

- b. What should their conclusion be?

18. Are the results reliable? Why or why not?