

Name: _____
Date: _____
Science p. _____
Teacher: _____

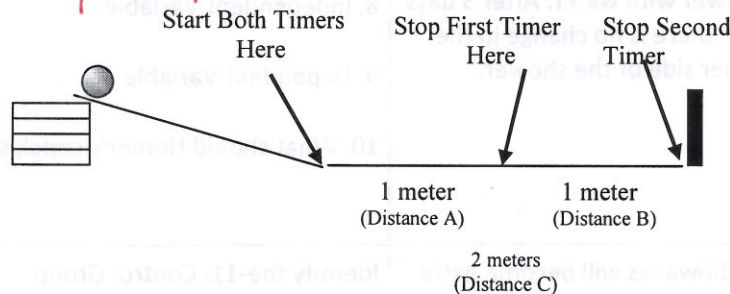
Introduction to Variables

Independent variable: The variable **I** change. **I** know the measurement before the investigation begins. It's the **ONE** thing I change on purpose in the investigation. I write the measurement into my data table before I do anything. I want to see how it causes changes to the dependent variable.

Dependent variable: The variable I **D**on't know before the investigation begins. I measure it **D**uring the investigation and then write it down.

Control variable: These variables I **C**an't change and want to keep the same. I want them all to be the same every time I test my independent variable. They make sure the test is fair. If I change more than one variable, I won't know which one causes the change.

Control Group: The part or group in an experiment that represents the "normal". The control group allows us to compare all other groups in the experiment to it.



In this investigation, you collected data on how much time it took a ball to roll one meter as it traveled farther from a ramp. You then used the time data to calculate the speed of the ball when it was one meter from the ramp and compare it to when it was two meters from the ramp. You could also collect data on three meters from the ramp if space permitted.

1. Which of the following is the **independent** variable in the investigation you just completed?

Distance from the Ramp Ramp Height Time to Travel One Meter Timer of Distance A

2. Which of the following is the **dependent** variable in the investigation you just completed?

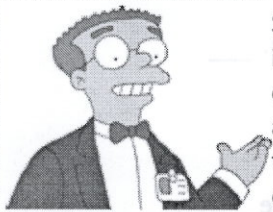
Distance from the Ramp Ramp Height Time to Travel One Meter Timer of Distance A

3. Which of the following is **NOT** a control variable in the investigation you just completed?

Timer of Distance A Speed Traveling One Meter Ramp Incline Ball Mass

Floor Surface Ramp Height Timer of Distance B

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:

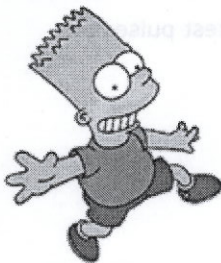
1. Control Variable : 50 ppl; both do same task
1. Control Group : Group B
2. Independent Variable : having the juice or not
3. Dependent Variable : amount of stacks completed correctly
4. What should Smithers' conclusion be?
The juice does not increase the productivity of the workers.
5. How could this experiment be improved? Group B could be given water



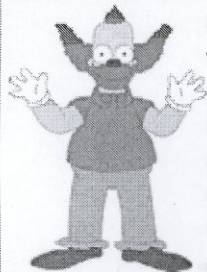
Homer notices that his shower is covered in a strange green slime. His friend Barney tells him that coconut juice will get rid of the green slime. Homer decides to check this out by spraying half of the shower with coconut juice. He sprays the other half of the shower with water. After 3 days of "treatment" there is no change in the appearance of the green slime on either side of the shower.

6. What was the initial observation?
Green slime on the shower walls.
- Identify the-
Control Variable : same shower; same green slime; waits 3-days
7. Control Group : the half that got sprayed w/ water
8. Independent Variable : what is being sprayed on the shower
9. Dependent Variable : reduction in green slime
10. What should Homer's conclusion be?
Homer should conclude that coconut juice does not get rid of green slime.

Bart believes that mice exposed to radiowaves will become extra strong (maybe he's been reading too much Radioactive Man). He decides to perform this experiment by placing 10 mice near a radio for 5 hours. He compared these 10 mice to another 10 mice that had not been exposed. His test consisted of a heavy block of wood that blocked the mouse food. he found that 8 out of 10 of the radiowaved mice were able to push the block away. 7 out of 10 of the other mice were able to do the same.



- Identify the-11. Control Group : 10 mice not exposed
- Control Variables: Groups of 10; same wood block
12. Independent Variable : Exposing the mice to radiowaves.
13. Dependent Variable : Extra strength or not
14. What should Bart's conclusion be?
This test is inconclusive because the results are not based on measurable facts.
15. How could Bart's experiment be improved?
Bart would have to test several times to get better results.



Krusty was told that a certain itching powder was the newest best thing on the market, it even claims to cause 50% longer lasting itches. Interested in this product, he buys the itching powder and compares it to his usual product. One test subject (A) is sprinkled with the original itching powder, and another test subject (B) was sprinkled with the Experimental itching powder.

Subject A reported having itches for 30 minutes. Subject B reported to have itches for 45 minutes.

- Identify the-16. Control Group : subject A
- Control variable : both subjects are exposed at the same time
17. Independent Variable : Type of itching powder
18. Dependent Variable : Amount of time the subject reported having itches
19. Explain whether the data supports the advertisements claims about its product.

$$50\% \text{ of } 30 = 15 \text{ (or } 1/2)$$

$$30 \text{ min.} + 15 \text{ min.} = 45 \text{ min.}$$

The data does support the ads for this product. Subject B experienced itches 50% longer than subject A.