

Simpsons Experimental Design



Smithers believes that his workers at the factory could be more productive. He thinks that a special juice will increase the productivity of workers. He selects 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 6,587 stacks,

Group B made 1,113 stacks.

Identify the...

1. Hypothesis: **If workers drink the special juice, then they will staple more stacks of paper.**
2. Control Group: **Group B**
3. Experimental Group: **Group A**
4. Independent Variable: **volume of special juice**
5. Dependent Variable: **number of stapled packs of paper**
6. What should Smithers' conclusion be?
The special juice improves the workers productivity since Group A stapled many more packets of paper than group B.

Discussion: How could this experiment be improved?

Vary the volume of juice given, increase the sample size, take more time points, conduct the experiment for a longer period of time.



Homer notices that the walls of his shower are 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.

7. What was the initial observation? **A strange green slime in the shower**

Identify the...

8. Hypothesis: **If the shower is sprayed with coconut juice, then the amount of green slime growing will decrease.**

9. Control Group: **The half of the shower that was not sprayed**

10. Independent Variable: **the volume of coconut juice**

11. Dependent Variable: **The disappearance of the green slime**

12. What should Homer's conclusion be? **Coconut juice is not effective when trying to get rid of green slime from the shower.**



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

Identify the...

13. Hypothesis: **If mice are exposed to microwaves, then they will become extra strong**

14. Control Group: **The mice that were not microwaved**

15. Experimental Group: **Microwaved mice**

16. Independent Variable: **Amount of microwave radiation hitting the mice**

17. Dependent Variable: **The strength of the mice**

18. What should Bart's conclusion be? **Inconclusive...Although there is a difference, the results are not significantly different and therefore there may or may not be an effect. At this point it would be hypothesized that microwave radiation does not increase the strength of mice.**

19. Ethical considerations? **Mice can experience pain and suffering, this experiment could cause serious harm (or death) to the mice. It seems that Bart is conducting this experiment out of curiosity and has little or no scientific merit.**

Discussion: How could Bart's experiment be improved? **Bart needs to use a much larger sample size and increase the number of groups to vary the amount of radiation received by the mice. Bart might also increase the mass of the block in front of the food since control mice were able to move it fairly easily. Even better? Change the experiment so that it does not involve living organisms.**



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...

20. Hypothesis: **If a person comes in contact with the newest itching powder on the market, then they will experience longer lasting itches compared to someone who has come in contact with the original powder.**

21. Control Group: **Subject A**

22. Independent Variable: **The type of itch powder**

23. Dependent Variable: **The time of itchiness**

24. Explain whether the data supports the advertisements claims about its product.

The data does support the advertisement since subject B did itch for 50% longer than subject A. However, since the sample size was so low, the experiment is not valid and therefore the results are not valid. Krusty needed to have a much larger sample size. He should have tested both powders on each participant to rule out that some people may react more severely than others.

Chemistry 11: Scientific Method

Name:



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.

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

Chemistry 11: Scientific Method

Name:



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.

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

Answer: There would be two groups. The control group would not get the product while the experimental group would get the product. The independent variable is the amount of product and the length of hair growth is the dependent variable. Lisa will measure the length of her family's hair each day for a month and graph the results for each group. She will then analyze the results to see if Rogooti resulted in quicker growing hair.

Station 1

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

Station 2

7. What was the initial observation?
8. Hypothesis:
9. Control Group:
10. Independent Variable:
11. Dependent Variable:
12. What should Homer's conclusion be?

Station 3

13. Hypothesis:

14. Control Group:

15. Independent Variable:

16. Dependent Variable:

17. What should Bart's conclusion be?

18. How could Bart's experiment be improved?

19. Ethical considerations?

Station 4

20. Hypothesis:

21. Control Group:

22. Independent Variable:

23. Dependent Variable:

24. Explain whether the data supports the advertisements claims about its product.