Science 10 Mr. Harwood
Number # **KEY**

Scientific Process Assignment

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 1 cup of the special juice to drink while they work. Group B is given 1 cup of water. After an hour, Smithers counts how many stacks of papers each group has made. Group A made 2,113 stacks, Group B made 1,587 stacks.

1. What is Smithers trying to find out?

Does a special juice increase the productivity of workers.

2. List 3 variables that would have to be controlled in this experiment.

Same number in the group
Same amount of liquid consumed
Same amount of time to complete the task

3. Which variable is the independent variable (changed between the 2 groups)?
What they drank

4. Which variable is the dependent variable (which variable is measured)?
Number of stacks of paper each group made

5. Is this experiment fair? Explain?
Yes. 1 independent variable and 1 dependent variable being measured. There were a bunch of controlled factors.

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 is Homer trying to find out?

If coconut juice gets rid of the strange green slime

7. List 3 variables that would have to be controlled (kept the same) in this experiment.

Amount of juice and water sprayed
Length of time
How much green slime on the area

8. Which variable is the independent variable (changed between the 2 groups?
Cleaning solution

9. Which variable is the dependent variable (which variable is measured)?
Amount of Slime

10. Is this experiment fair? Explain?
No. Area of green slime is not controlled.

Bart believes that mice can improve their strength if they are put on an exercise program. He decides to perform an experiment by placing running wheels in 10 different cages where each cage has 1 mouse. He compared these 10 mice to another 10 mice that did not have a running wheel in their cage. His test consisted of a heavy block of wood that blocked the mouse food. He found that 8 out of 10 of the mice that exercised with a running wheel were able to push the block away. In cages where mice did not have a running wheel, 3 out of 10 of the non-exercised mice were able to move the block.

11. What is Bart trying to find out?

Can mice improve their strength if they are put on an exercise program

12. List 3 variables that would have to be controlled (kept the same) in this experiment.

Number in each group
Amount of exercise the exercise group gets
Same wood block is used for each group

13. Which variable is the independent variable (changed between the 2 groups?
Exercise

14. Which variable is the dependent variable (which variable is measured)?
Could they move the block

15. Is this experiment fair? Explain?

Yes. One independent variable and the factors were controlled.

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". She uses her family members for this experiment and measures each person's hair growth each day for a week. Lisa has Bart use 10 mL of the product twice a day and his hair grows 9 cm. Lisa has Homer use 20 mL of the product once a day and his hair grows 2 cm. Lisa has her sister Maggy use 5 mL of the product 4 times a day and her hair grows 12 cm.

This is an example of an experiment that is not controlled or fair.

16. Describe 3 reasons why this experiment is not controlled or fair.

Not the same amount of product
Not the same application intervals
Subjects were not similar

17. Describe how you would change this experiment to make it fair.
Same amount of product used at the same time and more similar subjects (e.g. same age and gender)

Pea plants grow in very specific conditions. Pea plants that are grown in direct sunlight tend to grow the tallest while those grown in the shade do not grow as tall.

18. State a hypothesis regarding the effect of sunlight on the growth of pea plants.

If pea plants are in direct sunlight then the growth of the plant will be greater.

19. You task is to design an experiment to test the effect of sunlight on the growth of pea plants. Using any of the materials listed below, design an experiment which you could use to test your hypothesis. Briefly write out the experimental procedure as a series of numbered steps:

- 2 plant pots
- 6 pea seeds
- sterilized potting soil
- measuring cup + water
- ruler

20. Make a list of all the variables in this experiment. On your list, identify the independent, dependent variable and at least 3 controlled variables.

Variable	Type of Variable
Amount of sunlight	Independent variable
Growth of the plant	Dependent variable
Same amount of peas in each pot	Controlled variable
Same amount of time for growing	Controlled variable
Same amount of water	Controlled variable
Watered at the same time of day	Controlled variable
Same amount of soil in each pot	Controlled variable
Same type of plant pots used	Controlled variable