

Identifying Variables

Name _____ Period _____

Directions= Read through each scenario and identify the independent variable, dependent variable, and the control. Beware- not all experiments will have a control Group!

1. Sara wants to see if a new brand of hair dye lasts longer than the brand she currently uses. She puts the new hair dye on the left side of her head and the old brand on her right side. After 2 weeks she observes which side of her head has more gray hair showing through.
 - a. Independent Variable =
 - b. Dependent Variable =
 - c. Control Group =
 - d. Controlled Variables =
2. Rob is in charge of waxing the floor at the local mall. He wants to test a new brand of floor wax called Squeaky Clean. Rob waxes 20 floor tiles with Squeaky Clean and 20 tiles with the original wax brand. After one week he counts the number of scratches on the floor.
 - a. Independent Variable =
 - b. Dependent Variable =
 - c. Controlled Variables =
 - d. Control Group =
3. Chris wants to see if his basil plants grow better in full sunlight or partial sunlight. He plants 5 basil plants on the east side of his house that only receives light in the morning, and 5 more plants on the south side of his house that receives light all day. After a month Chris measures the height of each plant.
 - a. Independent Variable =
 - b. Dependent Variable =
 - c. Controlled Variables =
 - d. Control Group =
4. Shannon wants to see if the amount of time she studies will affect her grades. She normally studies for 30 minutes a night, but decides to double her study time to one hour per night. Over the next three weeks Shannon sees her science grade raise 10%.
 - a. Independent Variable =
 - b. Dependent Variable =
 - c. Controlled Variables =
 - d. Control Group =
5. Eric wants to see if a Shark vacuum works better than his current Oreck. He makes sure both of the vacuum canisters are empty, and then vacuums half of the living room with the Oreck and the other half with the Shark. After vacuuming he measures the amount of dust in each canister.
 - a. Independent Variable =
 - b. Dependent Variable =
 - c. Controlled Variables =
 - d. Control Group =

6. Rebecca wants to see if her kitten prefers new chicken flavored treats over her usual beef flavored treats. She puts 10 chicken treats in one bowl and 10 beef flavored treats in another bowl. She sees which treats her kitten eats first and repeats this experiment for 3 days.
- Independent Variable =
 - Dependent Variable =
 - Controlled Variables =
 - Control Group =
7. Mark notices he has dropped calls on his cell phone when he walks into his bedroom. His friend told him to try and wrap aluminum foil around his phone to get better signal. Mark talks on the phone 3 times while walking into his bedroom and drops 2 of the 3 calls. He wraps his phone in aluminum foil and talks on the phone 3 more times while walking into his bedroom. With the aluminum foil on his phone he only drops 1 phone call.
- Independent Variable =
 - Dependent Variable =
 - Controlled Variables =
 - Control Group =
8. Heidi is a chocolate lover and eats chocolate daily. She has a bad break-out and her friend told her eating chocolate causes pimples. Heidi continues to eat chocolate every day for 2 weeks and counts the number of pimples she has on her face. The following 2 weeks she doesn't eat any chocolate and counts the number of pimples on her face.
- Independent Variable =
 - Dependent Variable =
 - Controlled Variables =
 - Control Group =
9. Ruthie has a pet goldfish. After several months the goldfish quits growing. Ruthie's Mom told her the goldfish might have stopped growing because the tank is too small. Ruthie measures the size of her goldfish in its current tank, and then puts the goldfish in a larger tank. After 2 months the goldfish is now 1cm longer.
- Independent Variable =
 - Dependent Variable =
 - Controlled Variables =
 - Control Group =
10. Nicholas has been biting his nails since he was a kid. He wants to break the habit so he puts bitter tasting nail polish on his left hand and leaves his right hand without polish. After 3 days he notices his nails on his left hand have grown but he continued to bite his right hand nails.
- Independent Variable =
 - Dependent Variable =
 - Controlled Variables =
 - Control Group =

11. Students watched a cartoon either alone or with others and then rated how funny they found the cartoon to be.
- Independent Variable =
 - Dependent Variable =
 - Controlled Variables =
 - Control Group =
12. A comprehension test was given to students after they had studied textbook material either in silence or with the television turned on.
- Independent Variable =
 - Dependent Variable =
 - Controlled Variables =
 - Control Group =
13. Some elementary school teachers were told that a child's parents were college graduates, and other teachers were told that the child's parents had not finished high school; they then rated the child's academic potential.
- Independent Variable =
 - Dependent Variable =
 - Controlled Variables =
 - Control Group =
14. Workers at a company were assigned to one of two conditions: One group completed a stress management training program; another group of workers did not participate in the training. The number of sick days taken by these workers was examined for the two subsequent months.
- Independent Variable =
 - Dependent Variable =
 - Controlled Variables =
 - Control Group =
15. Students at a University were split into two groups and each received a different text for a philosophy course. One group received a traditional textbook, while the other received an interactive textbook on a tablet computer. After the course, the final exam marks between the two groups of students was compared.
- Independent Variable =
 - Dependent Variable =
 - Controlled Variables =
 - Control Group =
16. A researcher is studying the effect of sleep on aggression, thinking that less sleep will lead to more aggression. She has some people sleep 6 hours per night, some people sleep 3 hours per night and some people sleep as much as they want. She then monitors aggressive behavior during basketball games among participants.
- Independent Variable =
 - Dependent Variable =
 - Controlled Variables =
 - Control Group =

Is this experiment valid? Why is it valid or not valid?

What could you do to improve this experiment?

17. A researcher is curious to find out what effect classical music has on people's level of relaxation (as measured by heart rate). He suspects that listening to classical music will make people feel more calm and relaxed. He lets one group listen to classical music for one hour. He lets another group sit in a quiet room for one hour (i.e. they hear no music). After one hour, he monitors the heart rate of each participant to measure their level of relaxation.

- a. Independent Variable =
- b. Dependent Variable =
- c. Controlled Variables =
- d. Control Group =

18. Using the examples above and their format write your own experiment

- a. Independent Variable =
- b. Dependent Variable =
- c. Controlled Variables =
- d. Control Group =

Write experiment here

Question and Hypothesis Worksheet

A student is interested in designing several experiments to test the factors that affect how quickly an Alka-Seltzer® tablet dissolves in water (solution rate). For each question, write an appropriate hypothesis that could be tested with an experiment. Be sure each hypothesis is in the proper "If..., then..., because..." format.

Example=

Question= What effect does stirring have on solution rate?

Hypothesis= If the water is stirred, then the tablet will dissolve faster because stirring moves the water and Alka-Seltzer

Part 1

1. Question= What effect does the water temperature have on solution rate? Hypothesis=

2. Question= What effect does crushing the tablet have on solution rate? Hypothesis=

3. Question= What effect does adding soda to the water have on solution rate? Hypothesis=

Part 2

The next three questions are about factors affecting plant growth. For each question, write an appropriate hypothesis that could be tested with an experiment. Be sure each hypothesis is in the proper "If..., then..., because..." format.

4. Question= What effect does the amount of light have on plant growth? Hypothesis=

5. Question= What effect does the amount of water have on plant growth? Hypothesis=

6. Question= What effect does using plant food (Miracle Grow®) have on plant growth? Hypothesis=

Experimental Design

Select one of the questions from Part 1 above to test the effect of one variable on the solution rate of Alka-Seltzer®. Apply the steps of the Scientific Method to test the validity of your hypothesis. Once the plan is complete, follow the steps to conduct the experiment.

Question= Copy the question that you have selected from page 1.

Hypothesis= Copy the hypothesis (remember to use the proper format – “If..., then... because...”)=

Experiment= Plan your experiment by following the steps below.

What is the independent variable (manipulated variable) that you are testing?

What is the dependent variable (responding variable)?

What variables must be kept constant for this to be considered a “controlled experiment?”

List the materials you will need to perform this experiment.

Outline the procedure you will follow as you conduct this experiment. Be specific. Include a control group and allow for adequate time to repeat the experiment to verify your results.

