

## Study Guide

1. Josh's dog had a litter of 3 puppies. All of the puppies are males. Josh wonders what the chances of having an all-male litter are. To simulate the litter of puppies, Josh tosses 3 coins, letting a head stand for male and a tail stand for female. He tosses the coins 50 times and records her results each time. What type of investigation is he doing?
  - a. Observation
  - b. Survey
  - c. Experiment
  - d. Interview
2. Allison does an experiment to see which type of insulator keeps a cup of boiling hot water hot the longest. What will Allison use as a control in this experiment?
  - a. A cup of boiling water with no insulator
  - b. A cup with bowling water with no thermometer
  - c. An empty cup
  - d. A cup of water that is heated to keep it boiling
3. Bobby is setting up an experiment to see how plants react to drought conditions. Which condition will NOT be the same for the control plants as for the drought plants?
  - a. Type of soil used in each pot
  - b. Amount of sunlight each plant gets
  - c. Number of plants in each pot
  - d. Amount of water given to each plant
4. Karen is doing an experiment to see the way the heat given off by a lamp affects temperature in different parts of a room. She places a thermometer in different parts of a room. She collects temperature data in several locations. What is the control group for this experiment?
  - a. Temperatures taken near the light bulb
  - b. Temperatures taken in the room before the lamp is turned on
  - c. Temperatures of the lamp
  - d. Temperatures taken in the part of the room that is farthest from the light bulb
5. Christina lives in Florida and likes to learn about lightning. Which statement about lightning can be tested by making observations?
  - a. Lightning bolts do not make sound.
  - b. Lightning storms will always be dangerous.
  - c. Lightning is related to electricity.
  - d. Lightning bolts cause thunderstorms.

6. Ms. Evans is comparing the heights of plants grown in different kinds of soil. She records her thoughts, ideas, observations, and conclusions. Which of the following is a scientific observation that can be tested?
- Different soils affect plants less than different amounts of water
  - The plants grown in the sandy soil needed more water to grow
  - Different plants always grow to different heights
  - The plants grown in soil with clay were shorter
7. Four students are collecting data about liquids. Which student recorded an opinion and NOT an observation?

Justin	The shape of a liquid may not stay the same.
Chris	Changing the container does not change the mass.
Lauren	Mass is easier to measure than volume.
Lynnette	Freezing changes a liquid to a solid.

- Lynnette
  - Lauren
  - Chris
  - Justin
8. Mary planted 12 sunflower seeds. After 1 week she will count the number of seeds that have germinated. Mary says that more than half of the seeds will germinate. Which of the following best describes Mary's statement?
- Conclusion
  - Observation
  - Inference
  - Prediction
9. Michael and his brother are investigating motion, force, mass, and speed. They know that a scientific observation is information gathered by using the senses. What should Michael and his brother measure and write down to make the best scientific observations about the samples?
- Relationship of speed and mass
  - Effect that gravity has on speed
  - Kind of toy car most students like best
  - Speed of a toy car moving down a ramp
10. Cameron is comparing the distance traveled by two toy trucks. The trucks have different masses but the heights and lengths of the ramps are the same. What is the best reason for other people to repeat this experiment?

- a. To check that the conclusion matches the evidence
  - b. To change the heights of the ramps
  - c. To see whether they can get the same results
  - d. To compare the prediction with the conclusion
11. Nicole is using flower petals, mint leaves, and rubbing alcohol to make a perfume. What is the main difference between this activity and an experiment?
- a. There are no variables
  - b. It is not repeatable
  - c. There is no hypothesis
  - d. It is done under controlled conditions
12. Four students are organizing the data they gathered in their investigations. Which shows a way for students to analyze the results of an experiment?
- a. A graph to show the amount of time five different light bulbs burn out
  - b. A model to show how Earth revolves around the Sun
  - c. A Venn diagram to show how bacteria and viruses are alike and different
  - d. A poster to explain how a sundial works
13. Which of the following statements can be tested?
- a. Beetles avoid light
  - b. Beetles have 6 legs
  - c. Beetles have 3 body segments
  - d. Beetles are crustaceans
14. Which of the following would be the control in an experiment?
- a. Boiling water with no salt
  - b. Boiling water with 1 tablespoon of salt
  - c. Boiling water with 3 tablespoons of salt
  - d. Temperature
15. Adam is measuring how adding salt to water changes the time it takes the water to boil. Adam concludes that water boils at a higher temperature when salt is added. Which of these observations is evidence to support Adam's conclusion?
- a. All the salt did not dissolve in the water
  - b. Adding more salt may change the boiling temperature even quicker and at a greater degree
  - c. Stirring the water made it boil faster
  - d. The water with salt did not boil until the temperature was 219 degrees Fahrenheit
16. Joshua is experimenting to find out what makes some objects float and others sink. He fills an aquarium with water and tests many different objects. Joshua tries to use objects with about the

same volume and determines the objects' densities before starting. Joshua concludes that the objects that are denser will sink and that the less dense objects will float. Which of these observations provides evidence to support his conclusion?

- a. The objects that sink have a greater density
- b. The volume of water will not change the results
- c. Most of the objects that sink are made of metal
- d. The objects that float are small

17. Ms. Francois mixes salt and pepper in a beaker of water. Then she pours the mixture through filter paper. She finds that the filter paper separates out the pepper but not the salt. If this conclusion is correct, what should happen if Ms. Francois repeats the experiment?

- a. She should follow a completely new procedure
- b. She should use different amounts of salt and pepper
- c. She should not use filter paper
- d. She should get the same results

18. Ms. Tyler is studying the habitats of pandas. Last summer she observed pandas in China. What is the best reason for Ms. Tyler to make careful notes of her observations, procedures, and conclusions?

- a. So that other scientists will not criticize her work
- b. So that other scientists can check her results
- c. To make sure the habitats of the pandas do not change
- d. To draw conclusions about the habitats of animals in other regions

19. Cassie set up a model to show how clouds are formed. Why is Cassie's activity NOT an experiment?

- a. It is not repeatable
- b. No observations are being made
- c. There are no well-defined variables
- d. It is not carried out under controlled conditions

20. Ms. Claussen is doing an experiment to determine which fertilizer is best for her potato plants. She will test three groups of three plants. Group one will get fertilizer daily. Group two will get no fertilizer. Group three will get fertilizer weekly. What is the best reason to have one group that gets no fertilizer?

- a. To show that all plants need fertilizer
- b. To have before and after pictures to show the benefits of using fertilizer
- c. To compare that plant group to the other groups
- d. To see whether having no fertilizer will make the plant die

## Answer Key

1. C
2. A
3. D
4. B
5. A
6. D
7. B
8. D
9. D
10. C
11. C
12. A
13. A
14. A
15. D
16. A
17. D
18. B
19. C
20. C