

Vocabulary and Section Summary A

Science and Scientists

VOCABULARY

In your own words, write a definition of the following term in the space provided.

1. science

SECTION SUMMARY

Read the following section summary.

- Scientific progress is made by asking meaningful questions and conducting careful investigations.
- Three methods of investigation are research, observation, and experimentation.
- Science affects people's daily lives. Science can help save lives and resources and can help improve the environment.
- There are several types of scientists and many jobs that use science.

Vocabulary and Section Summary A

Scientific Methods

VOCABULARY

In your own words, write a definition of the following term in the space provided.

1. scientific methods

2. observation

3. hypothesis

4. data

SECTION SUMMARY

Read the following section summary.

- Scientific methods are the ways in which scientists answer questions and solve problems.
- Asking a question usually results from making an observation. Questioning is often the first step in using scientific methods.
- A hypothesis is a possible explanation or answer to a question. A good hypothesis is testable by an experiment.
- After performing an experiment, you should analyze your results. Analyzing is usually done by using calculations, tables, and graphs.
- After analyzing your results, you should draw conclusions about whether your hypothesis is supported.
- Communicating your results allows others to check or continue your work. You can communicate through reports, posters, and the Internet.

Vocabulary and Section Summary A

Safety in Science

VOCABULARY

In your own words, write a definition of the following term in the space provided.

1. first aid

SECTION SUMMARY

Read the following section summary.

- Appropriate safety precautions must always be taken when conducting scientific investigations.
- Scientists use symbols to alert them to particular dangers that they face when performing experiments in science.
- Goggles, gloves, and aprons are proper safety equipment that should be used in a science laboratory.
- If you suffer any injury during an experiment, inform your teacher immediately.
- Proper first-aid procedures must be followed when an accident occurs in the lab.

Chapter Review

USING VOCABULARY

- _____ 1. **Academic Vocabulary** Which of the following words means “the degree to which a measurement is precise and reliable”?
- a. variable
 - b. accuracy
 - c. parameter
 - d. constant

For each pair of terms, explain how the meanings of the terms differ.

2. *science* and *scientific methods*

3. *observation* and *data*

UNDERSTANDING CONCEPTS

Multiple Choice

- _____ 4. The statement “Sheila has a stain on her shirt” is an example of a(n)
- a. question.
 - b. hypothesis.
 - c. observation.
 - d. prediction.
- _____ 5. A hypothesis is a(n)
- a. question.
 - b. piece of information acquired by experimentation.
 - c. possible answer to a question.
 - d. observation.
- _____ 6. A variable parameter
- a. does not affect the result.
 - b. is the factor that changes in an experiment.
 - c. cannot change.
 - d. is rarely included in experiments.

Chapter Review *continued*

- _____ **7.** Organizing data into a graph is an example of
- a.** collecting data.
 - b.** forming a hypothesis.
 - c.** asking a question.
 - d.** analyzing data.
- _____ **8.** In a scientific investigation, the purpose of an experiment is to
- a.** test a hypothesis.
 - b.** communicate results.
 - c.** ask a meaningful question.
 - d.** organize data.

Short Answer

- 9. Describing** Explain how variable and controlled parameters are used in scientific experiments.

- 10. Summarizing** What does it mean for data to be *reproducible*? How would you conduct an experiment in such a way as to get data that are reproducible?

- 11. Evaluating** If a hypothesis is not testable, is the hypothesis therefore wrong? Explain.

Chapter Review *continued*

INTERPRETING GRAPHICS

Use the safety symbols below to answer the next three questions.



12. Identifying Explain in your own words what each of the safety symbols above means.

13. Applying If you were doing a laboratory experiment in which you needed to use chemicals that would cause burns if you spilled them on your skin, which symbol(s) would you expect to see in the instructions for the experiment?

14. Comparing Which symbol(s) represent(s) the use of safety equipment to be used for an experiment?

Chapter Review *continued*

WRITING SKILLS

15. Communicating Concepts Write a clear and coherent essay in which you describe the different ways in which science benefits society. Give examples from the text that support your conclusion.

Chapter Review *continued*

CRITICAL THINKING

16. Concept Mapping Use the following terms to create a concept map: *science, scientific methods, hypothesis, observations, and data.*

Chapter Review *continued*

17. Analyzing Methods Imagine that during a scientific investigation, you perform the same experiment several times but you get different results each time. What might cause your results to be different each time? How might you change your experiment so that it will have reproducible results?

18. Analyzing Ideas Imagine that you are conducting an experiment. You are testing the effects of the height of a ramp on the speed at which a toy car goes down the ramp. What is the variable parameter in this experiment? What parameters must be controlled?

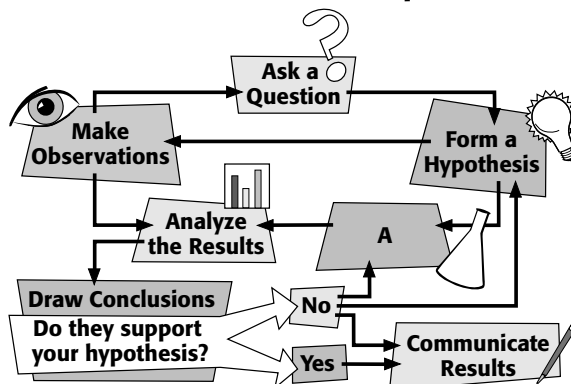
19. Evaluating Hypotheses You build a model boat that you predict will float. However, your tests show that the boat sinks. What would be a reasonable next step in your investigation?

20. Evaluating Sources Suppose that you are doing research on a scientific topic. You decide to use the World Wide Web to find information. You find a page that does not seem to be associated with any research institution and does not cite any sources for its information. Should you use this information? Explain.

Chapter Review *continued*

INTERPRETING GRAPHICS

Use the diagram below to answer the next two questions.



21. Analyzing Methods What are two different steps you can take after forming a hypothesis? Describe the circumstances in which you might take each step.

22. Analyzing Methods What step should you always take before drawing a conclusion? Explain why this step is so important.

MATH SKILLS

23. Solving Problems Suppose that you read the following results from a scientific investigation. Object 1: mass 512 g, volume = 3 cm³, density = 4 g/cm³. Object 2: mass = 9 g, volume = 3 cm³, density = 3 g/cm³. Object 3: mass = 12 g, volume = 2 cm³, density = 6 g/cm³. Based on these findings, what is the general formula for density? Show your work below.

Chapter Review *continued*

CHALLENGE

24. Evaluating Assumptions Suppose that a classmate says, “I don’t need to study science because I’m not going to be a scientist, and scientists are the only people who use science.” How would you respond? In your answer, give several examples of ways in which people who are not scientists may use physical science. (Hint: Think about the definition of *science* given in this chapter.)
