

Target Reading Skill





To help you review part of Section 1, copy and complete the graphic organizer at the right.

Heading	Question	Answer
Developing a Hypothesis	a. _____ ?	b. _____ ?
	c. _____ ?	d. _____ ?

Reviewing Key Terms

Choose the letter of the best answer.

- The process of change that occurs during an organism's life that produces a more complicated organism is called
 - structure.
 - function.
 - development.
 - variable.
- When you note that a rabbit has white fur, you are making a
 - quantitative observation.
 - qualitative observation.
 - prediction.
 - model.
- Music stores arrange CDs according to the type of music—rock, country, folk, and so on. This is an example of
 - observation.
 - inferring.
 - posing questions.
 - classifying.
- A statement that describes how to measure a variable or define a term is a(n)
 - controlled variable.
 - manipulated variable.
 - hypothesis.
 - operational definition.
- In labs in this book, which of the following indicates the danger of breakage?

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Complete the following sentences so that your answers clearly explain the Key Terms.

- Studying how the human body works and how different animals interact with one another are examples of topics in **life science**, which is _____.
- Obtaining oxygen is an example of a **function**, which is a process that _____.
- Noticing how much food is on your lunch tray is a **quantitative observation** because _____.
- Recording how many times your dog eats each day and how much he eats are examples of collecting **data**, which are _____.
- Giving a talk about the results of a scientific project is an example of **communicating** because _____.

Writing in Science

Description Think about the ways in which the police who investigate crimes act like scientists. In a paragraph, describe the scientific skills that police use in their work.



Target Reading Skill

Check students' organizers to see if appropriate questions were asked and correctly answered.

Reviewing Key Terms

- c
- b
- d
- d
- d
- the study of living things
- helps an organism survive
- it is an observation of an amount
- any kind of evidence gathered through observations
- it is sharing information with others

Writing in Science



E-LA: Writing 7.2.0

Writing Mode Descriptive

Scoring Rubric

- Exceeds criteria; includes many examples and discussion of tools that may be used
- Meets criteria; clearly describes each skill and applies it to the work of crime investigators; includes examples
- Lists scientific skills but does not apply them to crime investigators
- Includes only brief and/or inaccurate information

Video Assessment

The Work of Scientists

Show the Video Assessment to review chapter content and as a prompt for the writing assignment. Discussion questions:

What tools did present-day forensic scientists use to solve this investigation? (They used DNA testing and fiber analysis.)

What observations did modern-day forensic scientists make that helped them determine that John Toms was guilty of this historical crime? (They could take photos of the crime scene, take the temperature of the victim, make a plaster cast of a footprint, examine hair and fibers, and analyze blood samples and gunpowder residue.)

Review and Assessment

Checking Concepts

11. Observing, inferring, predicting, classifying, and making models
12. When you observe something, you use one or more of your senses to gather information.
13. Models help people study and understand things that are complex or that can't be observed directly.
14. Sample answer: Living things are made of many parts that serve different purposes. These parts and purposes obey the natural laws of physics.
15. A hypothesis is a possible explanation for a set of observations or answer to a scientific question. A hypothesis should be testable to gather evidence that will either support or disprove the hypothesis.
16. By keeping all variables except one (the manipulated variable) the same, the researcher knows that any experimental responses are due to the change in the manipulated variable.
17. Read the procedure carefully; review the general safety guidelines in Appendix A; if anything is unclear, ask your teacher for clarification.

Thinking Critically

18. Sample answer: Fingers can bend to grasp objects. The wrists move in different ways so that the hands can perform various movements.
19. Both types of observations are gathered using the senses. Qualitative observations are those that do not involve numbers. Quantitative observations include numbers or amounts.
20. Sample answer: The kitten was trying to catch the fish and fell into the tank. When the kitten became wet, it left the fish alone and began to struggle to get out of the tank.
21. Sample answer: Only the brand of glue should vary. The objects being glued as well as the amount of glue used should be the same for each type of glue tested.

Checking Concepts

11. List five skills that a scientist uses to learn more about the world.
12. When you observe something, what are you doing?
13. How are models useful to scientists?
14. In your own words, explain what is meant by the statement: *Physical principles underlie biological structures and functions.*
15. What is a hypothesis? Why is it important to develop a scientific hypothesis that is testable?
16. In an experiment, why is it important to control all variables except one?
17. Identify three things that you should do to prepare for a lab.

Thinking Critically

18. **Applying Concepts** Describe how the structure of your hands are complementary to their functions.
19. **Comparing and Contrasting** Compare and contrast qualitative and quantitative observations.
20. **Inferring** Suppose you come home to the scene below. What can you infer happened while you were gone?



21. **Problem Solving** Suppose you would like to find out which brand of glue holds better. What variables would you need to control in your experiment?

30 ♦

Applying Skills

Use the data table below to answer Questions 22–26.

Three students conducted a controlled experiment to find out how walking and running affected their heart rates.

Effect of Activity on Heart Rate
(in beats per minute)

Student	Heart Rate (at rest)	Heart Rate (walking)	Heart Rate (running)
1	70	90	115
2	72	80	100
3	80	100	120

22. **Controlling Variables** What is the manipulated variable in this experiment? What is the responding variable?
23. **Developing Hypotheses** What hypothesis might this experiment be testing?
24. **Predicting** Based on this experiment and what you know about exercising, predict how the students' heart rates would change while they are resting after a long run.
25. **Designing Experiments** Design a controlled experiment to determine which activity has more of an effect on a person's heart rate—jumping rope or doing push-ups.
26. **Drawing Conclusions** What do the data indicate about the increased physical activity and heart rate?

Standards Investigation

Performance Assessment Create a poster that summarizes your experiment for the class. Your poster should include the question you tested, how you tested it, the data you collected, and what conclusion you drew from your experiment. What problems did you encounter while carrying out your experiment? Is additional testing necessary?

Applying Skills

22. The manipulated variable is the type of activity (at rest, walking, running); the responding variable is heart rate.
23. Sample answer: A person's heart rate while running is greater than that person's heart rate while walking.
24. Their heart rates would decrease as they rested after a long run.

25. Sample answer: The manipulated variable is the type of activity—jumping rope or doing push-ups. The responding variable is heart rate. Controlled variables include testing the same person, time of day, temperature, humidity, and level of physical exertion before the activity.
26. The data indicate that heart rate increases as physical activity increases (becomes more strenuous).

Teachers can monitor student progress and supply remediation when necessary.

Choose the letter of the best answer.

- During a lab, if you spill a chemical on your skin, you should
 - apply pressure to the area.
 - rub the chemical off with a clean tissue.
 - flush the skin with large amounts of water.
 - throw the chemical in a waste basket. **S 7.7**

Use the table below to answer Questions 2–4.

Animals in a Field

Kind of Animal	Number of Animals	
	July	August
Grasshoppers	5,000	1,500
Birds	100	100
Spiders	200	500

- Which statement accurately expresses what happened in the field between July and August?
 - The numbers of all the animals increased.
 - The number of grasshoppers increased.
 - The number of spiders decreased.
 - The number of birds stayed the same. **S 7.7.c**
- Which of the following statements about the data is true?
 - In July, there were more grasshoppers than birds.
 - In August, there were more birds than spiders.
 - Between July and August, the number of grasshoppers increased by 500.
 - In both months, there were more spiders than grasshoppers. **S 7.7.c**
- Which of the following is a logical question that a scientist might pose based on the data in the table?
 - What killed off the spiders in the field?
 - Are spiders feeding on grasshoppers?
 - Do all birds fly south for the winter?
 - Are grasshoppers related to beetles? **S 7.7**

- Your brother has a cold and you think you will probably get a cold, too. Which of the following are you doing?
 - posing a question based on an inference
 - predicting based on an observation
 - making a model based on an observation
 - designing a controlled experiment

S 7.7.c

- Which of the following statements about structure and function in organisms is NOT true?
 - An organism's functions are the processes that enable it to survive.
 - An organism contains structures that are related to its functions.
 - All organisms have the same structure and function.
 - An organism needs energy to carry out its functions.

S 7.5

Apply the BIG Idea

- Read each question and explain whether it can be answered by conducting a scientific investigation.
 - Can dogs see in the dark?
 - How did pet dogs develop from wild dogs?
 - Which type of dog is the most fun?
 - How does a dog's tail help it survive?

Select one question that can be investigated scientifically. State a hypothesis. Then describe how you might conduct a scientific investigation to test your hypothesis. **S 7.7**

Standards Practice

- C; **S 7.7**
- D; **S 7.7.c**
- A; **S 7.7.c**
- B; **S 7.7**
- B; **S 7.7.c**
- C; **S 7.5**

Apply the BIG Idea

- Sample answers: **I.** Yes; Dogs are able to see in the dark. Put dogs into a darkened room and see if they can find an object that does not have an odor. **II.** Yes; Pet dogs are related to wild dogs because they share similar characteristics. Observe both pet dogs and wild dogs and compare and contrast their characteristics. **III.** No; This question is a matter of personal taste and cannot be objectively answered. **IV.** Yes; A dog's tail helps it to communicate to other living things. Expose dogs with different living and nonliving things and compare the results. **S 7.7**

Lab zone Standards Investigation

S 7.5, 7.7.c

Performance Assessment Students' posters will vary depending on the common belief tested. Each poster should include a statement of the common belief, the hypothesis, a description of the experiment, the data gathered in the form of a table or

graph, and the conclusion drawn from that data. In a summary, students should mention any problems encountered as well as state whether additional testing is necessary.

Teaching Resources

Laboratory Manual TE

- Standards Investigation Scoring Rubric

The Standards Investigation Scoring Rubric will help you evaluate students' work. If you share the rubric in advance, students will know what is expected of them.