

**Review and Reinforce**

2.1  
7<sup>th</sup> grade

# Scientific Explanation

## Understanding Main Ideas

Answer the following questions on a separate sheet of paper.

1. What are three methods scientists use to form scientific explanations?
2. Give an example of how different scientists might use these different methods.
3. What is the basis for scientific explanations?
4. By what process do scientists form scientific explanations?
5. What steps do scientists take when they find differing explanations based on the same evidence?
6. Explain why scientific explanations based on an opinion are not valid.

## Building Vocabulary

Fill in the blank to complete each statement.

7. Scientists \_\_\_\_\_, or determine the value of, differing scientific explanations based on the same evidence.
8. Scientific explanations are always based on \_\_\_\_\_  
\_\_\_\_\_.
9. A scientific explanation based on a(n) \_\_\_\_\_ is one that has not been confirmed by evidence.
10. A(n) \_\_\_\_\_ describes how something works or why something happens.

Place the outside corner, the corner away from the dotted line, in the corner of your copy machine to copy onto letter-size paper.

## Lesson Quiz

## Scientific Explanation

Write the letter of the correct answer on the line at the left.

1. \_\_\_ Which of the following is **NOT** a method scientists use to develop scientific explanations?
- A making models  
B posing questions  
C researching information  
D designing experiments
2. \_\_\_ Which of the following is the **most** common reason a scientist might change a scientific explanation?
- A new evidence  
B new opinions  
C new scientists  
D new photographs
3. \_\_\_ Which of the following is an example of empirical evidence?
- A an observation that flying is more fun than driving  
B an observation that the water is too cold for swimming  
C an observation that the thermometer reads 37°F  
D an observation that a room is warm
4. \_\_\_ Which of the following is an example of a scientific explanation?
- A It is impossible to predict the effect of global warming on the world's fish.  
B Deforestation might be a reason the Florida panther is endangered.  
C Florida has some of the most beautiful beaches in the world.  
D The shape of the Florida coastline is changing due to erosion.

If the statement is true, write *true*. If the statement is false, change the underlined words or words to make the statement true.

5. \_\_\_\_\_ Scientific explanations are always based on empirical evidence.
6. \_\_\_\_\_ Opinions describe how something works or happens.
7. \_\_\_\_\_ If different scientists interpret the same data differently, they evaluate each other's scientific explanations.
8. \_\_\_\_\_ Empirical evidence is data and observations that have been collected through educated guesses.
9. \_\_\_\_\_ Scientists begin to answer a question by analyzing evidence.
10. \_\_\_\_\_ Explanations that are based on evidence are not valid.

**Review and Reinforce**

2.2

# Scientists and Society

## Understanding Main Ideas

Answer the following questions in the spaces provided.

1. What impact does science have on society? Give an example.

---

---

---

2. What impact does society have on science? Give an example.

---

---

---

3. What controversy did Galileo's work cause?

---

---

---

## Building Vocabulary

Write a definition for the term on the lines below.

4. controversy

---

---

Place the outside corner, the corner away from the dotted line, in the corner of your copy machine to copy onto letter-size paper.

**Lesson Quiz****Scientists and Society**

Write the letter of the correct answer on the line at the left.

1. \_\_\_ Which scientist lived under house arrest as a result of publishing a book about his model of the universe?  
A Semmelweis  
B Carson  
C Galileo  
D Einstein
2. \_\_\_ Which is NOT a product that scientific discoveries helped to bring to society?  
A computers  
B meteors  
C phones  
D cars
3. \_\_\_ Which event happened as a result of Rachel Carson's scientific work?  
A More women died of infections after giving birth.  
B Fewer women died of infections after giving birth.  
C The government banned DDT.  
D The government developed DDT.
4. \_\_\_ Which of the following describes the heliocentric model?  
A The spread of infection is prevented by washing.  
B Earth moves around the sun.  
C The sun moves around the Earth.  
D Pesticides harm animals.

Fill in the blank to complete each statement.

5. The work that scientists do \_\_\_\_\_ society.
6. A public disagreement between groups is called a(n) \_\_\_\_\_.
7. The book *Silent Spring* was about the effects of \_\_\_\_\_, such as DDT, on the environment.
8. \_\_\_\_\_ influences the work of scientists,
9. Sometimes scientific work conflicts with the \_\_\_\_\_ of some people in society and society's leaders.
10. \_\_\_\_\_ was the Austrian doctor who suggested that doctors wash their hands before delivering babies.

2.3

**Review and Reinforce**

# How Science Changes

## Understanding Main Ideas

Answer the following questions on a separate sheet of paper.

1. Scientific knowledge can change as a result of which two things?
2. Describe one example of a scientific theory.
3. Under what circumstances would scientists discard a previously accepted scientific theory?
4. Describe one example of a scientific law.
5. What is the main difference between scientific theories and scientific laws?
6. What is the main similarity between scientific theories and scientific laws?

## Building Vocabulary

Write a definition for each of these terms on the lines below.

7. scientific theory

---

---

8. scientific law

---

---

Place the outside corner, the corner away from the dotted line, in the corner of your copy machine to copy onto letter-size paper.

## Lesson Quiz

## How Science Changes

If the statement is true, write *true*. If the statement is false, change the underlined word or words to make the statement true.

- \_\_\_\_\_ The law of thermodynamics states that all objects in the universe attract each other.
- \_\_\_\_\_ Scientific law changes as a result of new evidence or new interpretations of existing evidence.
- \_\_\_\_\_ A scientific theory can be overturned if proven incorrect.
- \_\_\_\_\_ A scientific law attempts to explain a pattern in nature.
- \_\_\_\_\_ A scientific law is a statement that describes what scientists expect to happen every time under a particular set of conditions.
- \_\_\_\_\_ Scientific theories explain one, specific scientific experiment.

Write the letter of the correct answer on the line at the left.

- \_\_\_ Which of the following *best* describes the relationship between scientific theories and scientific laws?
  - Theories are well-tested, but laws are unverified.
  - Both theories and laws offer explanations.
  - Theories explain a range of observations; laws describe an observed pattern.
  - Theories are untested hypotheses; laws are facts.
- \_\_\_ Which of the following *best* describes how scientific knowledge develops?
  - Scientific knowledge never changes.
  - Scientific knowledge consists of a group of fixed laws.
  - Scientific knowledge usually starts with the work of a genius.
  - Scientific knowledge is built up cautiously.
- \_\_\_ Einstein offered a new interpretation of the relationship between which two?
  - atoms and cells
  - mass and energy
  - mass and gravity
  - gravity and energy
- \_\_\_ Which of the following is explained by the cell theory?
  - why iron nails rust
  - why objects attract each other
  - why cells are produced from other cells
  - why water boils at 100°C

2.4

**Review and Reinforce**

# Models as Tools in Science

## Understanding Main Ideas

Answer the following questions in the spaces provided.

1. Why do scientists use models?

---

---

2. What is a system?

---

---

3. What three things do all systems have?

---

---

4. What are two ways that scientists use models?

---

---

## Building Vocabulary

Match each term with its definition by writing the letter of the correct definition in the right column on the line beside the term in the left column.

- |                 |  |
|-----------------|--|
| 5. ___ feedback | a. output that changes a system in some way                                      |
| 6. ___ output   | b. a group of parts that work together to perform a function or produce a result |
| 7. ___ process  | c. the material or energy that goes into a system                                |
| 8. ___ input    | d. what happens in a system  |
| 9. ___ model    | e. a representation of a simple or complex object or process                     |
| 10. ___ system  | f. the material or energy that comes out of a system                             |

Place the outside corner, the corner away from the dotted line, in the corner of your copy machine to copy onto letter-size paper.

**Lesson Quiz**

# Models as Tools in Science

Fill in the blank to complete each statement.

1. All systems have input, \_\_\_\_\_, and output.
2. A(n) \_\_\_\_\_ model might include a drawing or a three-dimensional object.
3. \_\_\_\_\_ is the material or energy that goes into a system.
4. A(n) \_\_\_\_\_ is a group of parts that work together to perform a function or produce a result.
5. Output that changes a system in some way is called \_\_\_\_\_.

If the statement is true, write *true*. If the statement is false, change the underlined word or words to make the statement true.

6. \_\_\_\_\_ Some systems have feedback.
7. \_\_\_\_\_ Mathematical equations and word descriptions are examples of models of processes.
8. \_\_\_\_\_ Scientists use models to understand things they can observe directly.
9. \_\_\_\_\_ When they use models, scientists keep in mind that predictions based on models are certain.
10. \_\_\_\_\_ What happens in a system is called input.