

Chapter 01 What Is Science?

True / False Questions

1. The property of mass is a measure of how heavy an object is.

FALSE

*Bloom's Level: 2. Understand
Section: 1.04
Topic: Measurement*

2. A referent is a familiar object one can use to describe the property of an object.

TRUE

*Bloom's Level: 3. Apply
Section: 1.01
Topic: Measurement*

3. Measurement information used to describe something is called data.

TRUE

*Bloom's Level: 3. Apply
Section: 1.06
Topic: Measurement*

4. A 100-g piece of iron has twice the volume as a 50-g piece of iron.

TRUE

*Bloom's Level: 4. Analyze
Section: 1.06
Topic: Measurement*

5. The mass of 1000 cm³ of water is a kilogram.

TRUE

Bloom's Level: 4. Analyze

Section: 1.06

Topic: Measurement

6. The density of a 100-g piece of iron is twice as great as the density of a 50-g piece of iron.

FALSE

Bloom's Level: 4. Analyze

Section: 1.06

Topic: Measurement

7. A controlled experiment has all variables held constant.

FALSE

Bloom's Level: 3. Apply

Section: 1.07

Topic: Nature of science

8. The symbol μ has the meaning of "is proportional to."

TRUE

Bloom's Level: 1. Remember

Section: 1.06

Topic: Equations

9. A theory is a hypothesis that has been shown to be correct by many experiments.

FALSE

Bloom's Level: 2. Understand

Section: 1.07

Topic: Nature of science

10. The symbol " Δ " is used to refer to an object's density.

FALSE

Bloom's Level: 1. Remember

Section: 1.06

Topic: Equations

Multiple Choice Questions

11. Equations are used to

A. describe a property.

B. define a concept.

C. describe how quantities change together.

D. All of the above.

Bloom's Level: 3. Apply

Section: 1.06

Topic: Equations

12. Which of the following is not a SI unit of the property it measures?

A. length - meter

B. volume - liter

C. time - second

D. mass - kilogram

Bloom's Level: 3. Apply

Section: 1.03

Topic: Measurement

13. In the text, the equation $V = tk$ is used to describe the relationship between the volume of a gas tank and the time required to fill it. The symbol " k "

- A. has units of min/gal.
- B. is a variable.
- C. is the proportionality constant.
- D. depends on the length of time.

Bloom's Level: 4. Analyze

Section: 1.06

Topic: Equations

14. The English unit of volume closest in size to a liter is

- A. gallon.
- B. ounce.
- C. quart.
- D. cup.

Bloom's Level: 1. Remember

Section: 1.05

Topic: Measurement

15. If a cube of Jell-o is cut into two pieces, what total property of the new pieces change?

- A. mass
- B. volume
- C. density
- D. surface area

Bloom's Level: 4. Analyze

Section: 1.06

Topic: Measurement

16. When something cannot be directly observed, it can be represented by a

- A. hypothesis.
- B. graph.
- C. model.
- D. theory.

Bloom's Level: 4. Analyze

Section: 1.07

Topic: Nature of science

17. Claims that appear to be pseudoscience should be
- A. accepted if it is said to have scientific validity.
 - B.** tested experimentally.
 - C. accepted if promoted by news media.
 - D. All of the above.

Bloom's Level: 4. Analyze

Section: 1.07

Topic: Nature of science

18. The property of volume is a measure of
- A. how much matter the object contains.
 - B. the compactness of matter in a given space.
 - C. the extent of the surface of the object.
 - D.** how much space the object occupies.

Bloom's Level: 2. Understand

Section: 1.06

Topic: Measurement

19. In the equation $A = \pi r^2$, π (pi) is a
- A. manipulated variable.
 - B. responding variable.
 - C.** numerical constant.
 - D. constant that depends on the size of the circle.

Bloom's Level: 4. Analyze

Section: 1.06

Topic: Equations

20. The re-creation of an event by comparing two situations in which all the factors are identical except one is called a

- A. tentative experiment.
- B. cause and effect demonstration.
- C. statistical test of truth.
- D.** controlled experiment.

Bloom's Level: 4. Analyze

Section: 1.07

Topic: Nature of science

21. A tentative scientific explanation which may or may not be rejected upon further experimentation is called a

- A. theory.
- B.** hypothesis.
- C. model.
- D. principle.

Bloom's Level: 3. Apply

Section: 1.07

Topic: Nature of science

22. A statement describing a relationship that is observed in nature to occur consistently time after time is a (an)

- A. hypothesis.
- B.** scientific law.
- C. scientific theory.
- D. model.

Bloom's Level: 3. Apply

Section: 1.07

Topic: Nature of science

23. Imagine a 10-g chunk of aluminum ($\rho = 2.7 \text{ g/cm}^3$) and a 10-g chunk of iron ($\rho = 7.9 \text{ g/cm}^3$). Which of the following is true?

- A. The chunk of iron is smaller than the chunk of aluminum.
- B. The chunk of iron is more massive than the chunk of aluminum.
- C. The chunk of aluminum is smaller than the chunk of iron.
- D. Both objects have the same volume.

Bloom's Level: 4. Analyze

Section: 1.06

Topic: Measurement

24. A cube that measures 2 cm on each side has a surface area to volume ratio of

- A. $1/2$.
- B. 2.
- C. 3.
- D. 6.

Bloom's Level: 4. Analyze

Section: 1.06

Topic: Measurement

25. A scheme of thought that has survived a test of detailed examination for long periods of time is a (an)

- A. hypothesis.
- B. scientific law.
- C. scientific theory.
- D. model.

Bloom's Level: 3. Apply

Section: 1.07

Topic: Nature of science

26. The most recently developed scientific theory is the
A. plate tectonic theory.
B. atomic theory.
C. theory about the nature of light.
D. theory of evolution.

Bloom's Level: 4. Analyze
Section: 1.07
Topic: Nature of science

27. One of the basic differences between science and a pseudoscience is the lack of
A. data.
B. valid and reliable experimental studies.
C. testable hypotheses.
D. theories.

Bloom's Level: 4. Analyze
Section: 1.07
Topic: Nature of science

28. A tentative thought- or experiment-derived explanation is known as a (an)
A. hypothesis.
B. scientific law.
C. scientific theory.
D. model.

Bloom's Level: 2. Understand
Section: 1.07
Topic: Nature of science

29. An event with two situations with all the influencing factors identical except one is a (an)
A. hypothetical experiment.
B. experiment.
C. controlled experiment.
D. impossible experiment.

Bloom's Level: 4. Analysis
Section: 1.07
Topic: Nature of science

30. An experimental situation used as the basis of comparison is the
- A. control group.
 - B. experimental group.
 - C. hypothetical group.
 - D. group of variables where changes will occur.

Bloom's Level: 4. Analysis

Section: 1.07

Topic: Nature of science