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Introductory Chemistry, 7e (Tro)
Chapter 1 The Chemical World

1.1 True/False Questions

1) Chemicals make up everything around you, including your own body.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.1

Learning Outcome: 1.1

Global Outcome: G1

2) Chemists study the properties of substances and the particles that compose those substances.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.1

Learning Outcome: 1.1

Global Outcome: G1

3) When a sealed can of soda pop is opened, the carbon dioxide gas fizzes out because the pressure is released.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.1

Learning Outcome: 1.2

Global Outcome: G2

4) Different molecules can have different shapes.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.1

Global Outcome: G1

5) The properties of water do not depend on how the atoms are bonded together in the molecule.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.1

Learning Outcome: 1.2

Global Outcome: G1

6) Both carbon dioxide molecules and water molecules consist of three atoms bonded together in a straight line.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.1

Learning Outcome: 1.2

Global Outcome: G1

7) Molecules are responsible for scattering light which causes the colors of the sunset.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.2

Learning Outcome: 1.2

Global Outcome: G1

8) All things are made of atoms or molecules.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.3

Learning Outcome: 1.2

Global Outcome: G1

9) Atoms and molecules determine how matter behaves.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.3

Learning Outcome: 1.2

Global Outcome: G1

10) Chemistry is the science that seeks to understand what matter does by studying living organisms.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.3

Learning Outcome: 1.3

Global Outcome: G1

11) The scientific method emphasizes reason as the way to understand the world.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G5

12) A hypothesis can never be proven as wrong.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

13) A theory is always true and can never be proven as wrong.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.4

Global Outcome: G1

14) Theories can be tested and validated through experimentation.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Global Outcome: G9

15) If experimental results contradict a hypothesis, the hypothesis must be either revised or discarded.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Global Outcome: G1

16) The Greek philosophers used observation and experimentation to understand the world.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.4

Global Outcome: G1

17) A scientific law is a brief statement that summarizes past observations and predicts future ones.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Global Outcome: G1

18) The law of conservation of mass states, "In a chemical reaction matter can be created and destroyed."

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.4

Global Outcome: G1

19) Antoine Lavoisier observed that burning objects in a closed container resulted in a loss of mass.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.4

Global Outcome: G1

20) A scientific theory describes the underlying reasons for observations and laws.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

21) The scientific method ensures that poor theories are eliminated over time and good theories remain.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

22) A theory is the equivalent of an opinion.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

23) Antoine Lavoisier proposed the atomic theory.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

24) John Dalton proposed the atomic theory.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

25) The first step in acquiring scientific knowledge is often the observation or measurement of some aspect of nature.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

26) If a hypothesis is *falsifiable*, it means that the hypothesis was once considered true but is now considered false.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

27) Observations from experiments are used to test theories.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

28) A theory can only exist after many experiments have validated a hypothesis.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

29) Scientific theories are also called *models*.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

30) The atomic theory explains why the law of conservation of mass is true.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G2

31) An established theory is the pinnacle of scientific understanding.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

32) Quantification is an important tool in understanding chemistry.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.5

Learning Outcome: 1.3

Global Outcome: G1

33) Lavoisier developed the law of conservation of mass.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.5

Learning Outcome: 1.3

Global Outcome: G1

34) Combustion means burning.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.4

Learning Outcome: 1.3

Global Outcome: G1

35) The phlogiston theory of combustion is still considered correct today.

Answer: FALSE

Diff: 1 Var: 1 Page Ref: 1.5

Learning Outcome: 1.3

Global Outcome: G1

36) Quantification involves measurement as part of an observation.

Answer: TRUE

Diff: 1 Var: 1 Page Ref: 1.5

Learning Outcome: 1.3

Global Outcome: G1

1.2 Multiple Choice Questions

1) Which of the following statements about soda pop is FALSE?

- A) Soda pop is a chemical mixture of mostly sugar, water and carbon dioxide.
- B) The molecules important to fizzing are carbon dioxide and water.
- C) The carbon dioxide is forced to mix with the water by the presence of sugars.
- D) When a can is opened, the pressure release allows carbon dioxide to form bubbles.
- E) All of the above statements are true.

Answer: C

Diff: 1 Var: 1 Page Ref: 1.1

Learning Outcome: 1.2

Global Outcome: G2

2) Which of the following items does NOT contain chemicals?

- A) drain cleaner
- B) organically grown vegetables
- C) air
- D) insecticides
- E) All of the above contain chemicals.

Answer: E

Diff: 1 Var: 1 Page Ref: 1.2

Learning Outcome: 1.2

Global Outcome: G2