

# 01 Test Bank: Matter and Energy

*Student:* \_\_\_\_\_

1. Which of the following is **not** an example of matter?
  - A. a rock
  - B. a hot-air balloon
  - C. carbon dioxide in your exhaled breath
  - D. steam
  - E. heat from a barbeque grill
  
2. Which of the following is **not** an example of matter?
  - A. air
  - B. light from a candle
  - C. wax
  - D. the propellant in an aerosol can
  - E. a stain on clothing
  
3. Which of the following is an example of matter?
  - A. sunlight
  - B. light from an incandescent bulb
  - C. helium in a balloon
  - D. heat from a car's radiator
  - E. all of these are correct
  
4. Which of the following does **not** apply to a chemical compound?
  - A. A chemical compound consists of two or more elements.
  - B. The elements in a compound are combined in definite proportions.
  - C. The characteristics of the compound are different from the characteristics of the elements from which it is made.
  - D. Compounds can be separated into their constituent elements using only physical methods.
  - E. A chemical compound can also be classified as a pure substance.
  
5. Which of the following statements regarding elements is **incorrect**?
  - A. Elements are the simplest building block of matter.
  - B. Elements cannot be broken down into simpler substances even by chemical means.
  - C. Some elements are not naturally occurring, and have been synthesized by scientists.
  - D. As the Greeks had thought, water is an element.
  - E. Elements are classified using a periodic table.
  
6. A combination of two or more substances that can be separated by using only a physical process is:
  - A. an element.
  - B. a compound.
  - C. a mixture.
  - D. a substance.
  - E. a composition.
  
7. Which of the following is an example of a pure substance?

- A. sand
- B. tap water
- C. aluminum in a soda can (not considering the paint or plastic coatings)
- D. river water
- E. granite

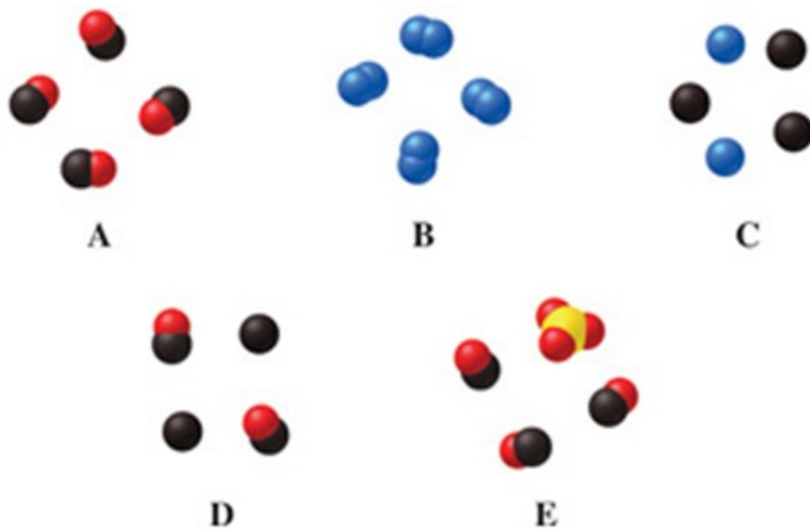
8. Which of the following is an example of a pure substance?

- A. a copper wire
- B. milk
- C. leather
- D. a piece of carpet
- E. ocean water

9. Which of the following is **not** an example of a mixture?

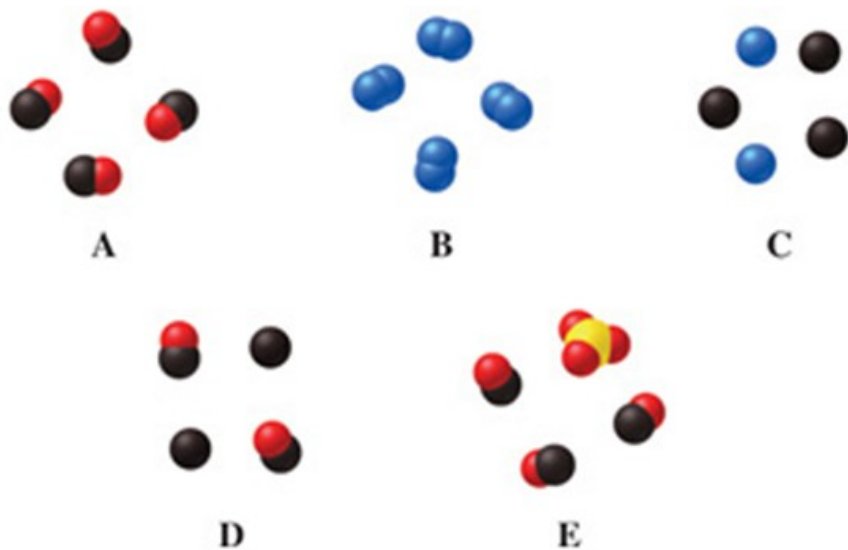
- A. air
- B. iced tea
- C. 24-carat gold
- D. brass
- E. a person

10. Which image(s) in the figure represents a pure elemental substance?



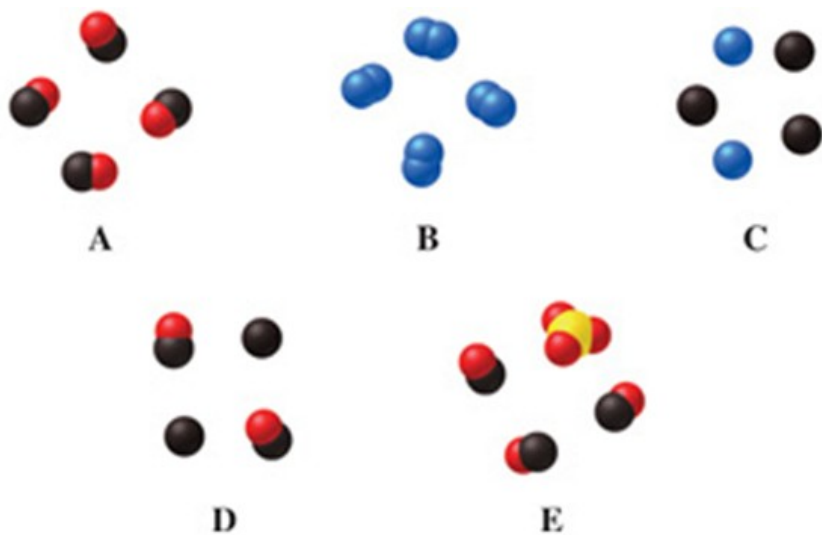
- A. image A
- B. image B
- C. image C
- D. images A and B
- E. image E

11. Which image(s) in the figure represents a mixture of compounds?



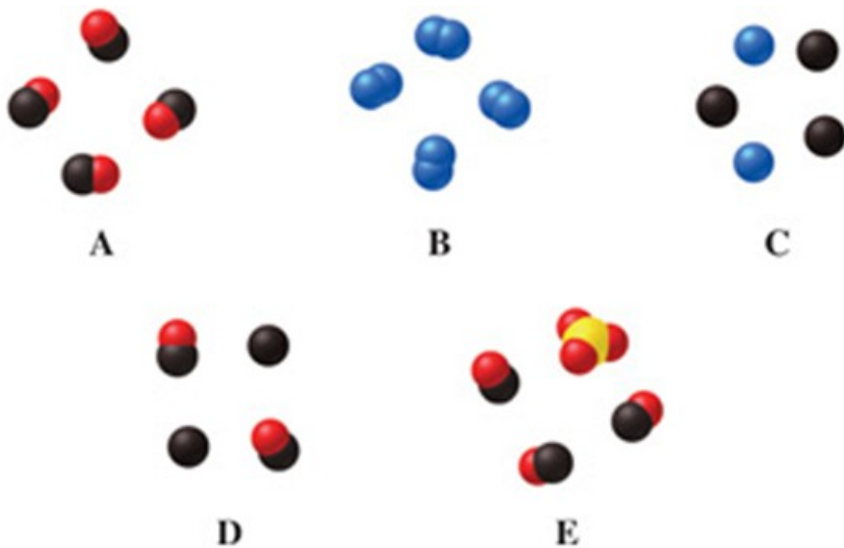
- A. image A
- B. images A and E
- C. image C
- D. image D
- E. image E

12. Which image(s) in the figure represents a mixture of two elements?



- A. image A
- B. image B
- C. image C
- D. image D
- E. images C and D

13. Which image(s) in the figure represents a mixture?



- A. image C
  - B. image D
  - C. image E
  - D. images C and D
  - E. images C, D, and E
14. Which of these substances is an element?
- A. C
  - B. CO
  - C. N<sub>2</sub>
  - D. HCl
  - E. both C and N<sub>2</sub>
15. Which of these substances is a compound?
- A. Co
  - B. NI<sub>3</sub>
  - C. Fe
  - D. CCl<sub>4</sub>
  - E. both NI<sub>3</sub> and CCl<sub>4</sub>
16. Select the substance below which is a compound:
- A. NO
  - B. Ir
  - C. Ni
  - D. Co
  - E. Rf
17. Which of these elements is a metal?
- A. Ca
  - B. N
  - C. Ne
  - D. C
  - E. O
18. Which of these elements is a nonmetal?
- A. Na

- B. Mg
- C. Cu
- D. K
- E. Cl

19. The symbol for the element barium is \_\_\_\_\_.

- A. B
- B. Br
- C. Ba
- D. Be
- E. Bi

20. The symbol for the element copper is \_\_\_\_\_.

- A. Co
- B. C
- C. Cr
- D. Cu
- E. Ca

21. The symbol for the element potassium is \_\_\_\_\_.

- A. P
- B. Pt
- C. K
- D. Po
- E. Pa

22. The symbol for the element sodium is \_\_\_\_\_.

- A. S
- B. So
- C. Sm
- D. Na
- E. Sn

23. The symbol for the element calcium is \_\_\_\_\_.

- A. Ca
- B. C
- C. Cm
- D. Cu
- E. Cl

24. The symbol for the element iron is \_\_\_\_\_.

- A. I
- B. Ir
- C. Fe
- D. In
- E. Ag

25. The symbol Hg corresponds to which element?

- A. magnesium
- B. gallium
- C. mercury
- D. hydrogen
- E. helium

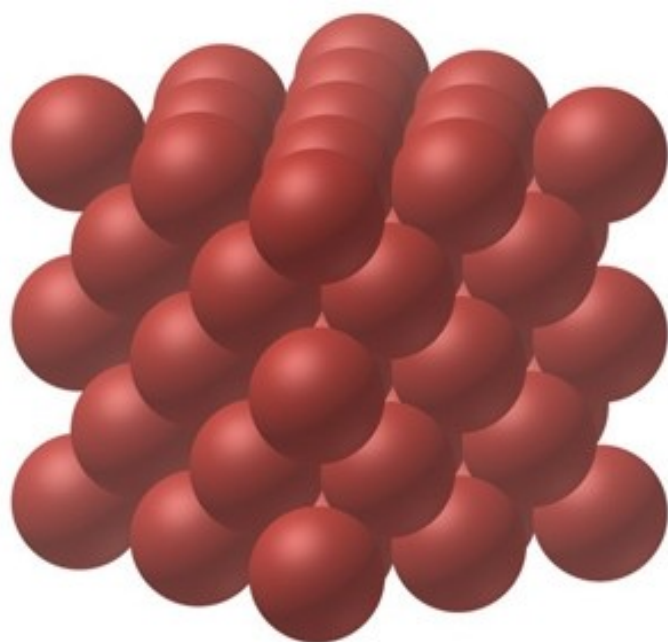
26. The symbol Au corresponds to which element?

- A. arsenic
- B. gold
- C. mercury
- D. silver
- E. aluminum

27. Which of the following is the physical state of matter which does not have a characteristic shape, but takes on the shape of the filled part of its container?

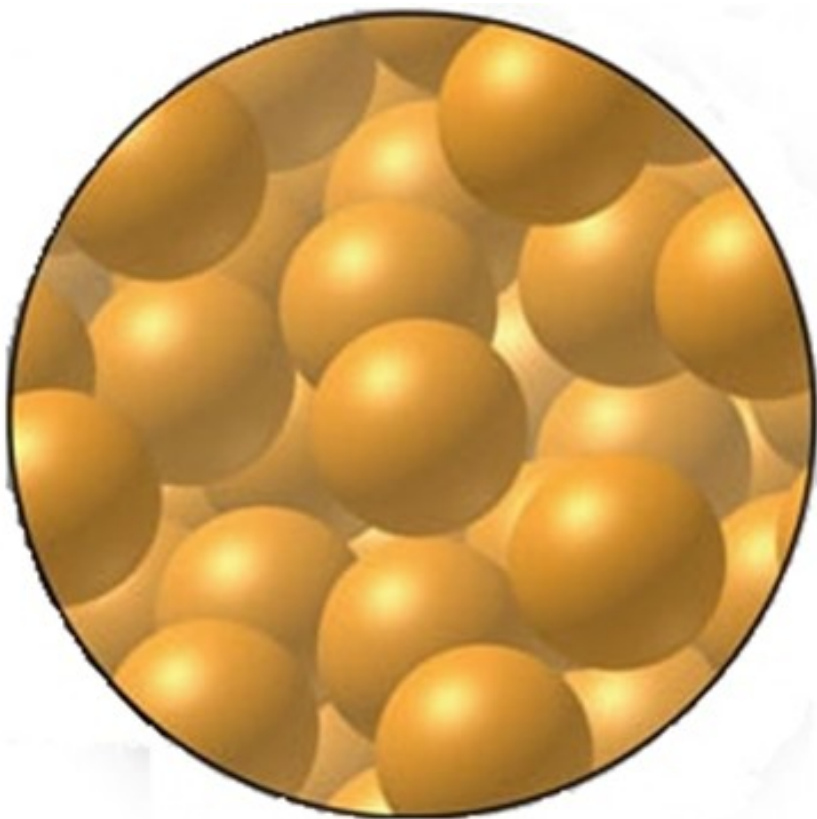
- A. solid
- B. liquid
- C. gas
- D. liquid or gas
- E. solid or liquid

28. Which physical state is represented in this image?



- A. gas
- B. liquid
- C. solid
- D. mixture

29. Which physical state is represented in this image?



- A. mixture
- B. gas
- C. liquid
- D. solid

30. Which of the following statements regarding the solid state of matter is **incorrect**?

- A. The symbol for solid is (s).
- B. Solids consist of particles that do not move past one another.
- C. The particles in a solid are in close contact with one another.
- D. Solids can be compressed to smaller volumes.
- E. When a solid is heated, the particles begin to move faster.

31. Which of the following statements regarding the gaseous state of matter is **incorrect**?

- A. The symbol for a gas is (g).
- B. Gases consist of particles that are in constant random motion.
- C. Gases can be compressed to smaller volumes.
- D. It is possible for gases to mix together.
- E. The particles in a gas are relatively close to one another.

32. A characteristic of a substance that involves the transformations the substance can undergo to produce a different substance is:

- A. a physical property.
- B. a chemical property.
- C. a physical change.
- D. a material property.
- E. a characteristic property.

33. Which of the following statements is **incorrect**?

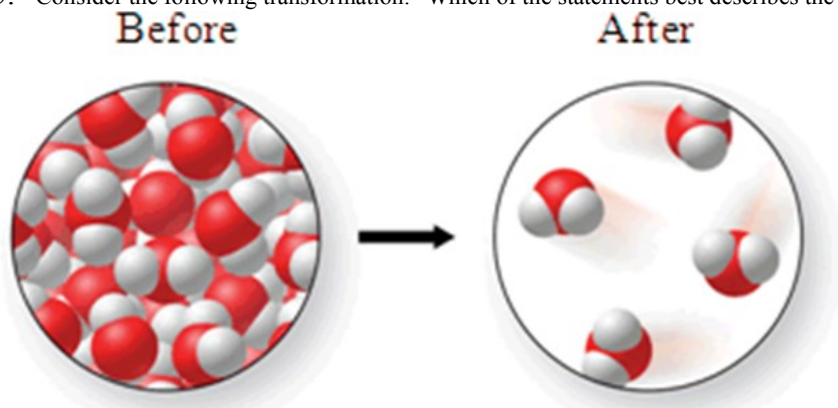
- A. The condensation of steam on a mirror is an example of a physical change.
- B. The burning of a piece of charcoal to a white powder is an example of a physical change.
- C. Evaporation of water from a fish tank is evidence of a physical change.

- D. The fact that sulfur is a yellow powder is a physical property.  
E. The fact that copper conducts electricity is a physical property.

34. Which of the following statements is **incorrect**?

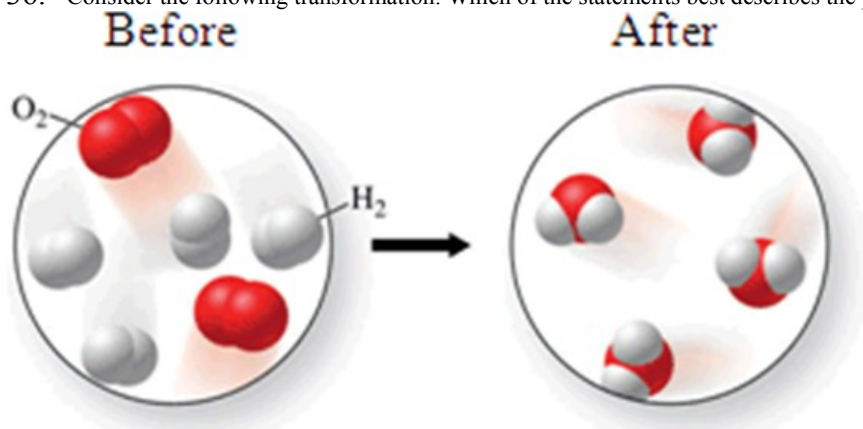
- A. The burning of propane in a barbecue grill is a physical change.  
B. The cooking of the meat on a barbecue grill is a chemical change.  
C. Cleaning the grill afterwards using a steel brush is a physical change.  
D. Further cleaning of the grill using a detergent is a chemical change.  
E. Digestion of the meat by your body involves both physical and chemical changes.

35. Consider the following transformation. Which of the statements best describes the process?



- A. A *chemical* change occurs in which atoms rearrange to form a new compound.  
B. A *chemical* change occurs in which an ionic compound is formed from diatomic elements.  
C. A *chemical* change occurs in which no atoms rearrange to form a new substance.  
D. A *physical* change occurs in which no atoms rearrange to form a new substance.  
E. A *physical* change occurs in which atoms rearrange to form a new compound.

36. Consider the following transformation. Which of the statements best describes the process?



- A. A *physical* change occurs in which no atoms rearrange.  
B. A *physical* change occurs in which atoms rearrange to form a new compound.  
C. A *chemical* change occurs in which no atoms rearrange.  
D. A *chemical* change occurs in which atoms rearrange to form a new compound.  
E. A *chemical* change occurs in which an ionic compound is formed from diatomic elements.

37. A 1-ounce serving of Cheetos has  $2.90 \times 10^2$  mg of sodium. What is this mass in units of grams?

- A. 290,000 g  
B. 0.290 g  
C. 0.00345 g  
D. 3.45 g  
E. 29.0 g



38. A brownie contains  $1.30 \times 10^2$  mg of sodium. What is this mass in units of grams?
- A.  $1.30 \times 10^5$  g
  - B. 0.130 g
  - C. 13.0 g
  - D. 7.69 g
  - E. 0.00769 g
39. A 1-ounce serving of a breakfast cereal contains  $1.60 \times 10^2$  mg of potassium. What is this mass in units of grams?
- A. 0.160 g
  - B.  $1.60 \times 10^5$  g
  - C. 6.25 g
  - D. 0.00625 g
  - E. 16.0 g
40. How many pounds of Spaghettios are in a can that contains 418 g? (1 lb = 453.6 g)
- A. 0.0576 lb
  - B.  $1.19 \times 10^4$  lb
  - C. 0.922 lb
  - D.  $1.90 \times 10^5$  lb
  - E.  $3.60 \times 10^{-2}$  lb
41. How many pounds of miniature candy bars are in a package that contains 197 g? (1 lb = 453.6 g)
- A. 0.0271 lb
  - B. 0.434 lb
  - C.  $5.59 \times 10^3$  lb
  - D.  $8.94 \times 10^5$  lb
  - E.  $1.69 \times 10^{-3}$  lb
42. A 1-ounce serving of Doritos has 17 g of carbohydrates. What is this mass in units of ounces? (16 ounces = 453.6 g)
- A. 2.7 oz
  - B. 0.037 oz
  - C. 0.60 oz
  - D. 480 oz
  - E. 28 oz
43. A can of Spaghettios has a mass of 418 g. What is this mass in units of ounces? (16 ounces = 453.6 g)
- A. 0.922 oz
  - B.  $1.90 \times 10^5$  oz
  - C. 14.8 oz
  - D.  $1.19 \times 10^4$  oz
  - E.  $5.76 \times 10^{-2}$  oz
44. A package of miniature candy bars has a mass of 197 g. What is this mass in units of ounces? (16 ounces = 453.6 g)
- A. 6.95 oz
  - B. 0.434 oz
  - C.  $8.94 \times 10^4$  oz
  - D.  $1.43 \times 10^6$  oz
  - E.  $2.71 \times 10^{-2}$  oz
45. A can of cashews has a mass of 8.5 ounces. What is this mass in kg? (16 ounces = 453.6 g)
- A. 3900 kg
  - B. 0.24 kg
  - C. 240 kg

- D. 3.9 kg
- E. 0.14 kg

46. A can of soup has a mass of 10.75 ounces. What is this mass in kg? (16 ounces = 453.6 g)

- A. 304.8 kg
- B. 0.3048 kg
- C.  $2.370 \times 10^{-2}$  kg
- D.  $1.481 \times 10^{-3}$  kg
- E.  $4.876 \times 10^3$  kg

47. A loaf of bread has a mass of 24 ounces. What is this mass in kg? (16 ounces = 453.6 g)

- A. 0.68 kg
- B. 680 kg
- C.  $5.3 \times 10^{-2}$  kg
- D. 0.85 kg
- E.  $1.7 \times 10^5$  kg

48. What is the mass in kilograms of a copper pipe that weighs 12.5 pounds? (1 lb = 453.6 g)

- A. 0.0276 kg
- B. 27.6 kg
- C.  $5.67 \times 10^3$  kg
- D. 5.67 kg
- E.  $1.72 \times 10^{-3}$  kg

49. A typical light-weight bicycle weighs 17.5 pounds. What is the mass of a typical bike in kilograms? (1 lb = 453.6 g)

- A. 0.0386 kg
- B. 7.94 kg
- C.  $7.94 \times 10^6$  kg
- D.  $1.27 \times 10^5$  kg
- E.  $2.41 \times 10^{-3}$  kg

50. A bottle of Gatorade has a volume of 591 mL. What is this volume in L?

- A. 5.91 L
- B. 591,000 L
- C. 0.00169 L
- D. 1.69 L
- E. 0.591 L

51. A bottle of soda has a volume of 474 mL. What is this volume in L?

- A. 4.74 L
- B. 0.474 L
- C. 47.4 L
- D. 2.11 L
- E. 0.00211 L

52. A bottle of Gatorade has a volume of 591 mL. What is this volume in fluid ounces? (1 fluid ounce = 29.57 mL)

- A. 20.0 fl oz
- B. 0.0500 fl oz
- C.  $1.40 \times 10^5$  fl oz
- D. 14.0 fl oz
- E. 35 fl oz

53. A bottle of soda has a volume of 474 mL. What is this volume in fluid ounces? (1 fluid ounce = 29.57 mL)

- A. 16.0 fl oz

- B. 0.0624 fl oz
- C.  $1.75 \times 10^5$  fl oz
- D. 17.5 fl oz
- E. 30 fl oz

54. A bottle of fluoride rinse has a volume of 500 mL. Which of the following equivalences is **incorrect**?

- A.  $V = 0.500$  L
- B.  $V = 500$  cm<sup>3</sup>
- C.  $V = 5.00 \times 10^{-4}$  m<sup>3</sup>
- D.  $V = 0.500$  m<sup>3</sup>
- E. both  $V = 500$  cm<sup>3</sup> and  $V = 0.500$  m<sup>3</sup>

55. If the displacement (size) of a motorcycle engine is 1500 cm<sup>3</sup>, which of the following equivalences is **incorrect**?

- A.  $V = 1500$  mL
- B.  $V = 1.500$  L
- C.  $V = 1.500 \times 10^{-3}$  m<sup>3</sup>
- D.  $V = 15.00$  m<sup>3</sup>
- E. both  $V = 1500$  mL and  $V = 15.00$  m<sup>3</sup>

56. A box has dimensions of 4.0 cm by 8.5 cm by 2.0 cm. The volume of the box in mL is:

- A. 34 mL
- B. 0.068 mL
- C. 68 mL
- D. 17 mL
- E. 14.5 mL

57. A box has dimensions of 2.5 cm by 3.0 cm by 4.0 cm. The volume of the box in milliliters and liters is:

- A. 30 mL and 0.030 L
- B. 30 mL and 30,000 L
- C. 7.5 mL and 0.0075 L
- D. 7.5 mL and 7,500 L
- E. 3,000 mL and 3.0 L

58. A box has dimensions of 3.5 cm by 4.0 cm by 8.0 cm. The volume of the box in milliliters and liters is:

- A. 112 mL and 112,000 L
- B. 112 mL and 0.112 L
- C. 0.112 mL and 112 L
- D. 14 mL and 0.014 L
- E. 14 mL and 14,000 L

59. The proprietor of a rock shop insists that a nugget is pure gold. If the nugget occupies a volume of 5.40 mL, what would its mass have to be if it were truly pure gold? ( $d_{\text{gold}} = 19.3$  g/mL)

- A. 104 g
- B. 3.57 g
- C. 0.279 g
- D. 13.9 g
- E. insufficient information given

60. If the density of a certain alcohol is 0.785 g/mL, what volume of the alcohol would have a mass of 75.0 g?

- A. 0.955 mL
- B. 58.9 mL
- C. 75.8 mL
- D. 95.5 mL

E. insufficient information given

61. The density of aluminum is  $2.7 \text{ g/cm}^3$ . What is the mass of a piece of aluminum foil which is 10.0 cm by 5.0 cm by 0.0018 cm thick?

- A. 0.090 g
- B.  $3.3 \times 10^{-2} \text{ g}$
- C. 0.24 g
- D.  $1.4 \times 10^2 \text{ g}$
- E. 19 g

62. If the density of a certain alcohol is 0.785 g/mL, what mass of the alcohol would have a volume of 200.0 mL?

- A. 2.55 g
- B. 157 g
- C. 200 g
- D. 255 g
- E.  $3.92 \times 10^{-3} \text{ g}$

63. A student exploring the desert finds a piece of metal with a volume of  $29.9 \text{ cm}^3$ . If this metal has a mass of 337.5 g, which of the following is the metal most likely to be?

- A. aluminum (density =  $2.70 \text{ g/cm}^3$ )
- B. sodium chloride (density =  $2.16 \text{ g/cm}^3$ )
- C. lead (density =  $11.3 \text{ g/cm}^3$ )
- D. gold (density =  $19.3 \text{ g/cm}^3$ )
- E. The student discovered a new metal with a density of  $0.0886 \text{ g/cm}^3$ .

64. If a child's balloon filled with helium were heated with a blow-dryer, the balloon would increase in volume. What would happen to the density of the helium in the balloon?

- A. It would decrease.
- B. It would increase.
- C. It would remain the same.
- D. A chemical reaction would occur, so it is impossible to predict.
- E. The initial statement is incorrect—the volume of the balloon would not increase.

65. A rubber stopper sinks in water, but floats in methylene chloride. Place these three substances in order from least density to greatest density.

- A. rubber stopper < methylene chloride < water
- B. rubber stopper < water < methylene chloride
- C. water < methylene chloride < rubber stopper
- D. water < rubber stopper < methylene chloride
- E. methylene chloride < water < rubber stopper

66. A diamond will float in water, but sink in carbon tetrachloride. Place these three substances in order from least density to greatest density.

- A. water < diamond < carbon tetrachloride
- B. diamond < water < carbon tetrachloride
- C. carbon tetrachloride < diamond < water
- D. diamond < carbon tetrachloride < water
- E. water < carbon tetrachloride < diamond

67. An ice cube will sink in hexane, but float in water. Place these three substances in order from least density to greatest density.

- A. ice < water < hexane
- B. hexane < ice < water
- C. hexane < water < ice
- D. water < hexane < ice
- E. water < ice < hexane

68. If the temperature of a bowl of ice cream increases from  $-10^\circ\text{C}$  to  $25^\circ\text{C}$ , what is the increase in temperature in units of degrees Celsius and

Kelvin?

- A. 15°C, 288 K
- B. 35°C, 308 K
- C. 35°C, 273 K
- D. 35°C, 35 K
- E. 15°C, 273 K

69. If the temperature of water in a freezer decreases from 22°C to -25°C, what is the decrease in temperature in units of degrees Celsius and Kelvin?

- A. 47°C, 320 K
- B. 47°C, 273 K
- C. 47°C, 47 K
- D. 3°C, 276 K
- E. 3°C, 3 K

70. Which of the following is **not** an example of a physical property?

- A. The boiling point of acetone is 56°C.
- B. Sand is more dense than water.
- C. Helium is a gas at room temperature.
- D. Copper gets a greenish coating on it when exposed to moist air.
- E. Water is colorless.

71. Which of the following is **not** an example of a physical property?

- A. The boiling point of liquid nitrogen is 77 K.
- B. Nitrogen is a gas at room temperature.
- C. Nitrogen is colorless.
- D. Nitrogen gas is less dense than oxygen gas.
- E. Nitrogen combines with oxygen in an internal combustion engine to form oxides of nitrogen.

72. Which of the following is **not** an example of a chemical property?

- A. An iron nail will rust in water.
- B. Sugar will dissolve in water.
- C. A steak on a hot frying pan will turn brown.
- D. Gasoline will burn if ignited.
- E. Water can be decomposed to hydrogen and oxygen.

73. Which of the following is **not** an example of a chemical change?

- A. Water becomes purple as Kool-Aid is dissolved in it.
- B. Aluminum turns white after prolonged exposure to air.
- C. A piece of charcoal becomes white after it burns.
- D. Magnesium burns in air to make magnesium oxide.
- E. Zinc metal reacts with hydrochloric acid to form zinc chloride and hydrogen gas.

74. Which of the following is **not** an example of a physical change?

- A. Ice melts when warmed.
- B. Dry ice sublimates (converts from a solid to a gas) at room temperature.
- C. Liquid nitrogen converts to a gas at room temperature.
- D. Blue copper sulfate crystals dissolve in water to form a blue solution.
- E. When hydrogen and oxygen gas are mixed in the presence of a spark, water is formed.

75. Which of the following is **not** a form of energy?

- A. chemical
- B. mechanical

- C. temperature
- D. heat
- E. electrical

76. Which of the following statements is **incorrect**?

- A. Energy is the capacity to do work or transfer heat.
- B. Mechanical work occurs when a force acts over a distance.
- C. Kinetic energy is the energy possessed by an object due to its position.
- D. Potential energy can be possessed by chemical compounds.
- E. A compound releases potential energy when it undergoes a spontaneous chemical reaction.

77. Which of the following statements is **incorrect**?

- A.  $\text{H}_2$  molecules which are moving faster must have more kinetic energy than slower moving  $\text{H}_2$  molecules.
- B. A book stored on a high bookshelf has potential energy.
- C. A volleyball flying over a net has both kinetic energy and potential energy.
- D. When gasoline is burned to power an engine, it releases only potential energy.
- E. The water in a waterfall has kinetic, potential, and mechanical energy.

78. Which of the following is **not** a practice that would be employed by a scientist?

- A. testing ideas by experimentation
- B. organizing findings in specific ways
- C. predicting the outcome of an experiment and then not testing the prediction
- D. trying to explain why things happen
- E. making physical models to explain the behavior of matter

79. Which of the following is **not** normally a part of scientific inquiry?

- A. observations
- B. philosophizing
- C. theories
- D. hypotheses
- E. laws

80. Which of the following statements is **incorrect**?

- A. The scientific method is a way of looking at the world that is different from non-science forms of inquiry.
- B. The scientific method does not allow for the use of inferences, and everything must be proved by direct observation.
- C. A theory is a tentative explanation of the behavior or properties of matter.
- D. Scientists must isolate and study one variable at a time when performing experiments.
- E. A behavior of matter that has universal validity is called a law.

81. The number 0.005925 correctly expressed in scientific notation is:

- A.  $59.25 \times 10^{-4}$
- B.  $5.93 \times 10^{-3}$
- C.  $5.9 \times 10^{-3}$
- D.  $5.925 \times 10^3$
- E.  $5.925 \times 10^{-3}$

82. The number 0.0416 correctly expressed in scientific notation is:

- A.  $4.16 \times 10^3$
- B.  $4.2 \times 10^3$
- C.  $4.16 \times 10^{-2}$
- D.  $4.2 \times 10^{-3}$
- E.  $4.2 \times 10^{-2}$

83. The number 0.0017400 correctly expressed in scientific notation is:

- A.  $1.74 \times 10^3$
- B.  $1.7400 \times 10^3$
- C.  $1.74 \times 10^{-2}$
- D.  $1.74 \times 10^{-3}$
- E.  $1.7400 \times 10^{-3}$

84. The number  $5.650 \times 10^{-2}$  correctly expressed in decimal form is:

- A. 0.565
- B. 0.0565
- C. 0.05650
- D. 565
- E. 565.0

85. The number 54,900 correctly expressed in scientific notation is:

- A.  $5.49 \times 10^4$
- B.  $54.9 \times 10^3$
- C.  $5.49 \times 10^{-3}$
- D.  $5.5 \times 10^4$
- E.  $5.49 \times 10^{-4}$

86. The number 625,000 correctly expressed in scientific notation is:

- A.  $6.25 \times 10^{-5}$
- B.  $6.25 \times 10^{-4}$
- C.  $6.3 \times 10^5$
- D.  $6.2 \times 10^5$
- E.  $6.25 \times 10^5$

87. The correct answer for the product  $(6.45 \times 10^5) \times (1.2 \times 10^4)$  is: (considering significant figures)

- A.  $7.7 \times 10^9$
- B.  $5.375 \times 10^1$
- C.  $7.74 \times 10^9$
- D.  $7.7 \times 10^{11}$
- E.  $7.74 \times 10^{11}$

88. The correct answer for the product  $(8.2 \times 10^{-3}) \times (2.84 \times 10^5)$  is: (considering significant figures)

- A.  $2.3288 \times 10^3$
- B.  $2.3 \times 10^3$
- C.  $2.3 \times 10^4$
- D.  $2.3 \times 10^5$
- E.  $2.33 \times 10^2$

89. The correct answer for the product  $(6.1 \times 10^4) \times (3312)$  is: (considering significant figures)

- A.  $2.020 \times 10^8$
- B.  $2.02 \times 10^8$
- C.  $2.0 \times 10^9$
- D.  $2.02032 \times 10^8$
- E.  $2.0 \times 10^8$

90. What is the correct answer to the following mathematical operation expressed to the appropriate number of significant figures?

$$\left(3.225 \times 10^{19}\right) \times \left(\frac{0.01}{7.3 \times 10^{-3}}\right)$$

- A.  $4 \times 10^{19}$
- B.  $4.4 \times 10^{19}$
- C.  $4.42 \times 10^{19}$

- D.  $4.418 \times 10^{19}$   
 E.  $4.42 \times 10^{18}$

91. What is the correct answer to the following mathematical operation expressed to the appropriate number of significant figures?

$$\frac{0.040}{(2.6345 \times 10^{-4}) \times (7.91)}$$

- A.  $12.0 \times 10^4$   
 B. 1.9  
 C. 19  
 D. 19.1  
 E. 19.195

92. When the mathematical operation is carried out, how many significant figures should be reported in the answer?  $\frac{0.040}{(2.6345 \times 10^{-4}) \times (7.91)}$

- A. 1  
 B. 2  
 C. 3  
 D. 4  
 E. 5

93. When the mathematical operation is carried out, how many significant figures should be reported in the answer?

$$(3.225 \times 10^{19}) \times \left( \frac{0.01}{7.3 \times 10^{-3}} \right)$$

- A. 1  
 B. 2  
 C. 3  
 D. 4  
 E. 5

94. The correct answer for the subtraction  $28.645 \text{ g} - 22.105 \text{ g}$  is: (considering significant figures)

- A. 6.54 g  
 B.  $6.54 \times 10^{-1} \text{ g}$   
 C. 6.540 g  
 D. 6.5400 g  
 E.  $6.54 \times 10^1 \text{ g}$

95. The correct answer for the addition  $56.234 + 0.0021 \text{ g}$  is: (considering significant figures)

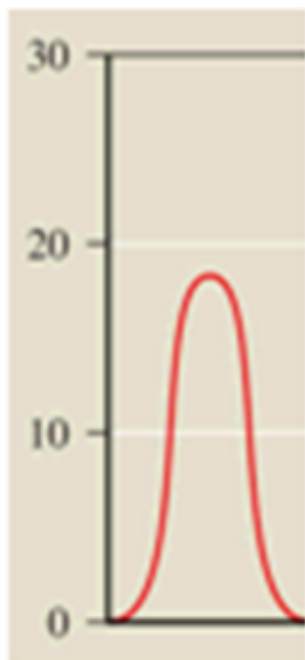
- A. 56 g  
 B. 56.24 g  
 C. 56.2361 g  
 D. 56.236 g  
 E. 56.255 g

96. The correct answer for the addition  $102.5 \text{ mL} + 6.55 \text{ mL}$  is: (considering significant figures)

- A. 109.05 mL  
 B. 109 mL  
 C. 109.0 mL  
 D. 109.050 mL  
 E. 108.15 mL

97. How would you report the value at the peak of the graph shown below assuming the y-axis is in units of





cm?

- A. 18 cm
- B. 18.0 cm
- C. 18.00 cm
- D. 20 cm
- E. 20.0 cm

98. If a jet's cruising altitude is 32,200 ft (to three significant figures), this distance in km is: (1 mile = 1.61 km; 1 mile = 5280 ft)

- A. 9.8186 km
- B. 9.82 km
- C.  $1.06 \times 10^8$  km
- D.  $2.737 \times 10^8$  km
- E.  $2.00 \times 10^4$  km

99. If a car is traveling at 97 km/hr, what is its speed in mi/hr? (1 mile = 1.61 km)

- A.  $1.6 \times 10^2$  mi/hr
- B. 156 mi/hr
- C. 60.2 mi/hr
- D.  $6.0 \times 10^2$  mi/hr
- E. 3600 mi/hr

100. The American Heart Association recommends that for every 1000 dietary calories consumed, the sodium intake should be 1000 mg or less and should not exceed a daily limit of 3300 mg for an adult. What is the yearly limit on sodium intake in pounds?

- A.  $7.3 \times 10^{-3}$  lb
- B. 2.7 lb
- C. 730 lb
- D.  $1.2 \times 10^3$  lb
- E.  $1.2 \times 10^6$  lb

101. Water is considered a mixture because it consists of hydrogen and oxygen.

True False

102. The larger the sample of a given substance, the more dense it is.

True False

103. A glass of tea with ice cubes in it is an example of a heterogeneous mixture.

True False

104. A “law” in science is a rule that is enacted by a group of influential scientists.

True False

105. The law of conservation of mass states that the mass of the products of a chemical reaction is equal to the mass of the reacting substances.

True False

106. Scientific theories are explanations of natural behavior.

True False

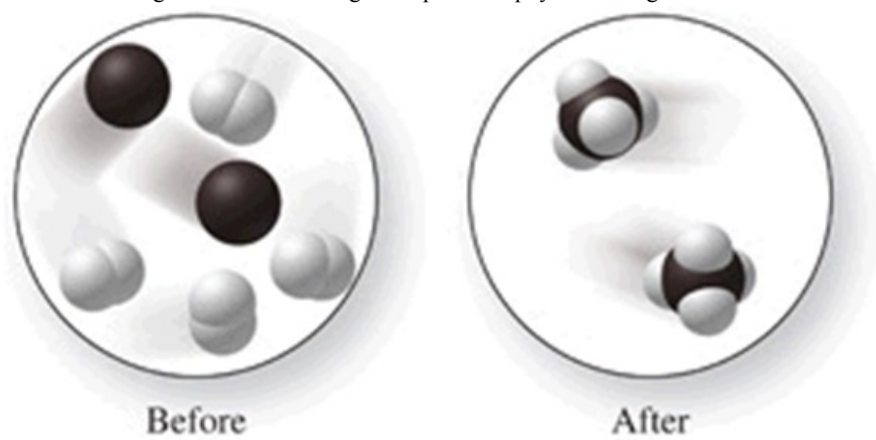
107. The symbol (w) means “dissolved in water.”

True False

108. The symbol  $\text{H}_2\text{O}(aq)$  is the normal way to represent the compound water.

True False

109. The changes shown in the diagram represent a physical change.



True False

110. If the number 6.2510 is rounded to 2 significant figures, it would be reported as 6.3.

True False

111. The symbol for the element sodium is S.

True False

112. The symbol for the element cobalt is CO.

True False

113. A bottle of liquid mercury has a mass of  $5.00 \times 10^2$  g. What is the volume of the mercury in mL? ( $d_{\text{mercury}} = 13.6$  g/mL)

114. Pentane has a boiling point of  $36^\circ\text{C}$ . What is this temperature equivalent to in kelvins?

115. A pump for a small swimming pool will circulate  $3.00 \times 10^2$  gallons per hour (gph) through the filter. If the pool contains  $1.30 \times 10^3$  gallons of water, how many hours will it take to filter the entire contents of the pool?

116. If the price of gasoline is \$4.25/gallon, what would the price be per liter of gasoline? (1 L = 1.057 qt., 4 qt. = 1 gal.)

117. The samples shown in the figure have the same mass. Which one has the greater density, the one on the left or the one on the right?



118. The length of a sofa is 2.05 m. Convert this length to units of cm.
119. The length of a sofa is 2.05 m. Convert this length to units of mm.
120. The length of a sofa is 2.05 m. Convert this length to units of km.
121. The density of iron is  $7.9 \text{ g/cm}^3$ . If  $453.6 \text{ g} = 1 \text{ pound}$ , what is this mass in pounds?

# Chapter 01 Test Bank: Matter and Energy **Key**

1. Which of the following is **not** an example of matter?

- A. a rock
- B. a hot-air balloon
- C. carbon dioxide in your exhaled breath
- D. steam
- E.** heat from a barbeque grill

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Classification and States of Matter, Properties of Matter*

*Topic: Study of Chemistry*

2. Which of the following is **not** an example of matter?

- A. air
- B.** light from a candle
- C. wax
- D. the propellant in an aerosol can
- E. a stain on clothing

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Classification and States of Matter, Properties of Matter*

*Topic: Study of Chemistry*

3. Which of the following is an example of matter?

- A. sunlight
- B. light from an incandescent bulb
- C.** helium in a balloon
- D. heat from a car's radiator
- E. all of these are correct

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Classification and States of Matter, Properties of Matter*

*Topic: Study of Chemistry*

4. Which of the following does **not** apply to a chemical compound?

- A. A chemical compound consists of two or more elements.
- B. The elements in a compound are combined in definite proportions.
- C. The characteristics of the compound are different from the characteristics of the elements from which it is made.
- D.** Compounds can be separated into their constituent elements using only physical methods.
- E. A chemical compound can also be classified as a pure substance.

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Classification and States of Matter, Properties of Matter*

*Topic: Study of Chemistry*

5. Which of the following statements regarding elements is **incorrect**?

- A. Elements are the simplest building block of matter.
- B. Elements cannot be broken down into simpler substances even by chemical means.
- C. Some elements are not naturally occurring, and have been synthesized by scientists.
- D.** As the Greeks had thought, water is an element.
- E. Elements are classified using a periodic table.

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Classification and States of Matter, Properties of Matter*

*Topic: Study of Chemistry*

6. A combination of two or more substances that can be separated by using only a physical process is:

- A. an element.

- B. a compound.
- C.** a mixture.
- D. a substance.
- E. a composition.

*Bloom's: 1. Remember*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Classification and States of Matter, Properties of Matter*

*Topic: Study of Chemistry*

7. Which of the following is an example of a pure substance?

- A. sand
- B. tap water
- C.** aluminum in a soda can (not considering the paint or plastic coatings)
- D. river water
- E. granite

*Bloom's: 1. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Classification and States of Matter, Properties of Matter*

*Topic: Study of Chemistry*

8. Which of the following is an example of a pure substance?

- A.** a copper wire
- B. milk
- C. leather
- D. a piece of carpet
- E. ocean water

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Classification and States of Matter, Properties of Matter*

*Topic: Study of Chemistry*

9. Which of the following is **not** an example of a mixture?

- A. air
- B. iced tea
- C.** 24-carat gold
- D. brass
- E. a person

*Bloom's: 2. Understand*

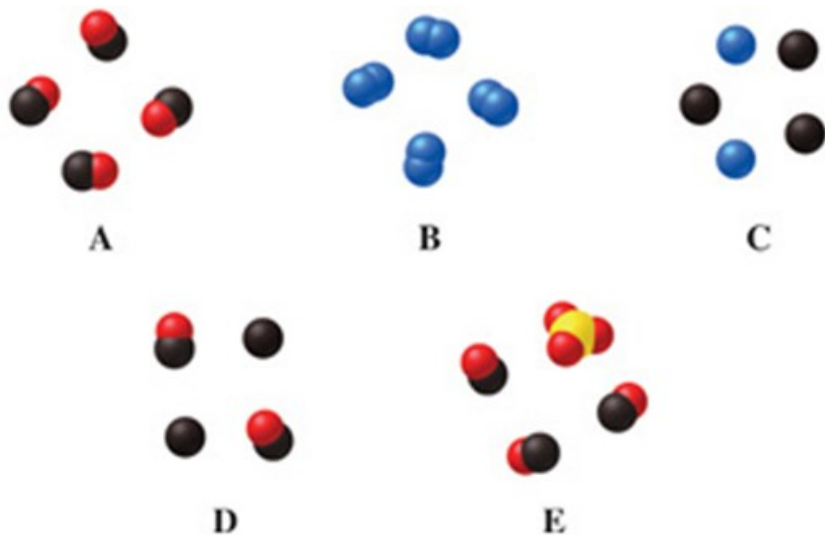
*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Classification and States of Matter, Properties of Matter*

*Topic: Study of Chemistry*

10. Which image(s) in the figure represents a pure elemental substance?



- A. image A
- B. image B
- C. image C
- D.** images A and B
- E. image E

Bloom's: 2. Understand

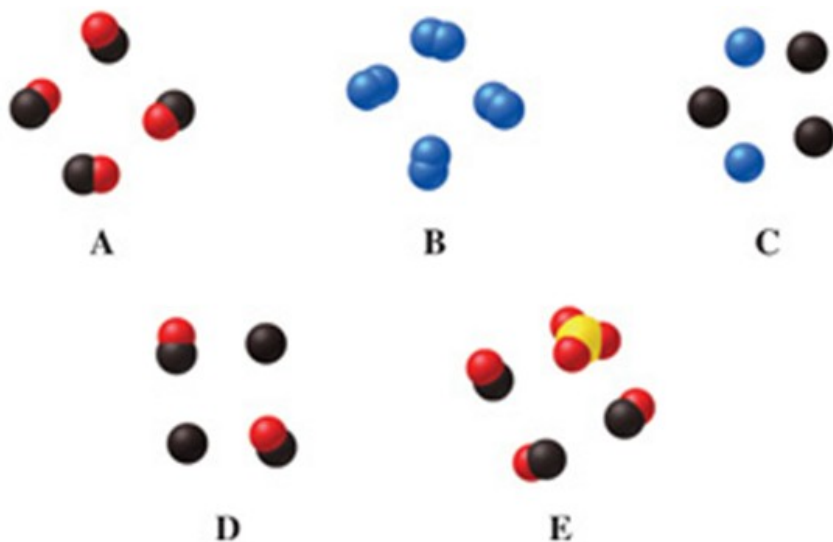
Difficulty: Medium

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

11. Which image(s) in the figure represents a mixture of compounds?



- A. image A
- B. images A and E
- C. image C
- D. image D
- E.** image E

Bloom's: 2. Understand

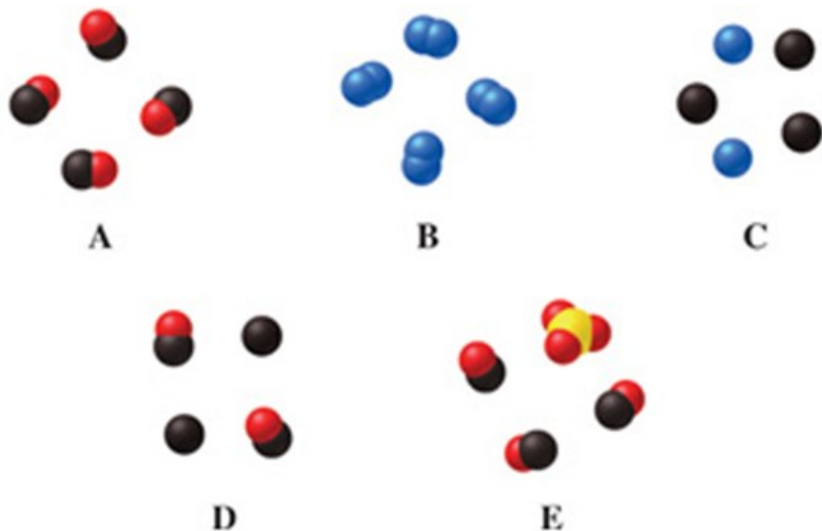
Difficulty: Medium

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

12. Which image(s) in the figure represents a mixture of two elements?



- A. image A
- B. image B
- C.** image C
- D. image D
- E. images C and D

Bloom's: 2. Understand

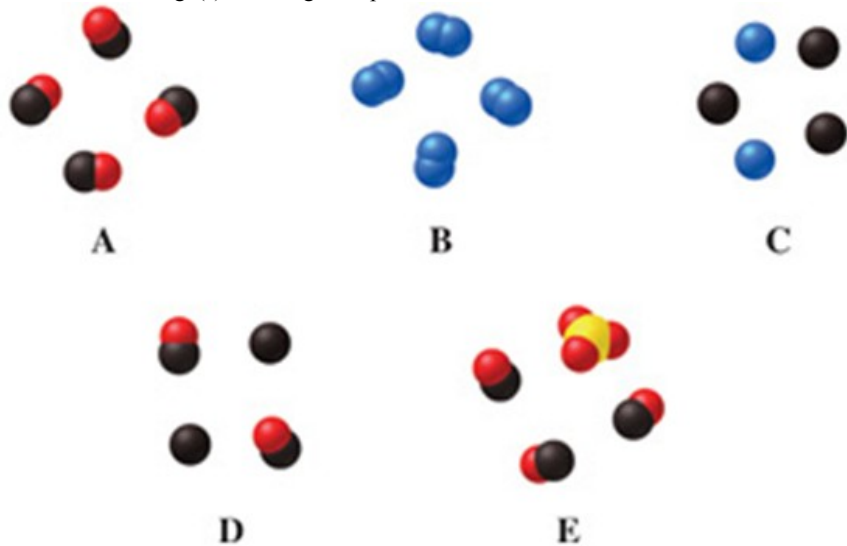
Difficulty: Medium

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

13. Which image(s) in the figure represents a mixture?



- A. image C
- B. image D
- C. image E
- D.** images C and D
- E.** images C, D, and E

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

14. Which of these substances is an element?

- A. C
- B. CO
- C. N<sub>2</sub>

D. HCl

**E.** both C and N<sub>2</sub>

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Classification of Matter, Elements and the Periodic Table, Chemical Formulas*

*Topic: Study of Chemistry, Components of Matter*

15. Which of these substances is a compound?

A. Co

B. NI<sub>3</sub>

C. Fe

D. CCl<sub>4</sub>

**E.** both NI<sub>3</sub> and CCl<sub>4</sub>

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Classification and States of Matter, Elements and the Periodic Table, Chemical Formulas*

*Topic: Study of Chemistry, Components of Matter*

16. Select the substance below which is a compound:

**A.** NO

B. Ir

C. Ni

D. Co

E. Rf

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Classification and States of Matter, Elements and the Periodic Table, Chemical Formulas*

*Topic: Study of Chemistry, Components of Matter*

17. Which of these elements is a metal?

**A.** Ca

B. N

C. Ne

D. C

E. O

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Classification of Matter, Elements and the Periodic Table, Chemical Formulas*

*Topic: Study of Chemistry, Components of Matter*

18. Which of these elements is a nonmetal?

A. Na

B. Mg

C. Cu

D. K

**E.** Cl

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Classification and States of Matter, Elements and the Periodic Table, Chemical Formulas*

*Topic: Study of Chemistry, Components of Matter*

19.

---

The symbol for the element barium is \_\_\_\_\_.

A. B

B. Br

**C.** Ba

D. Be

E. Bi

*Bloom's: 1. Remember*



Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table, Chemical Formulas

Topic: Components of Matter

20. The symbol for the element copper is \_\_\_\_\_.

A. Co

B. C

C. Cr

**D.** Cu

E. Ca

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table, Chemical Formulas

Topic: Components of Matter

21. The symbol for the element potassium is \_\_\_\_\_.

A. P

B. Pt

**C.** K

D. Po

E. Pa

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table, Chemical Formulas

Topic: Components of Matter

22. The symbol for the element sodium is \_\_\_\_\_.

A. S

B. So

C. Sm

**D.** Na

E. Sn

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table, Chemical Formulas

Topic: Components of Matter

23. The symbol for the element calcium is \_\_\_\_\_.

**A.** Ca

B. C

C. Cm

D. Cu

E. Cl

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Classification of Matter, Properties of Matter

Topic: Study of Chemistry

24. The symbol for the element iron is \_\_\_\_\_.

A. I

B. Ir

**C.** Fe

D. In

E. Ag

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table, Chemical Formulas

Topic: Components of Matter

25. The symbol Hg corresponds to which element?

A. magnesium

- B. gallium
- C.** mercury
- D. hydrogen
- E. helium

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table, Chemical Formulas

Topic: Components of Matter

26. The symbol Au corresponds to which element?

- A. arsenic
- B.** gold
- C. mercury
- D. silver
- E. aluminum

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table, Chemical Formulas

Topic: Components of Matter

27. Which of the following is the physical state of matter which does not have a characteristic shape, but takes on the shape of the filled part of its container?

- A. solid
- B.** liquid
- C. gas
- D. liquid or gas
- E. solid or liquid

Bloom's: 1. Remember

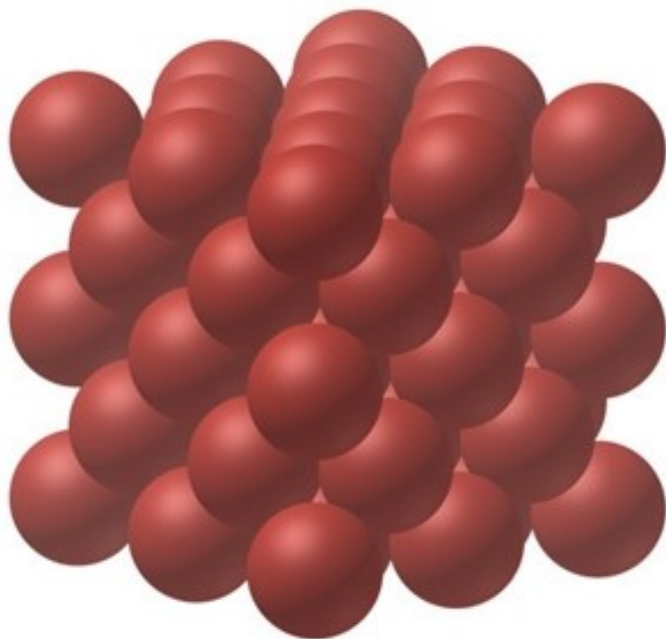
Difficulty: Easy

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

28. Which physical state is represented in this image?



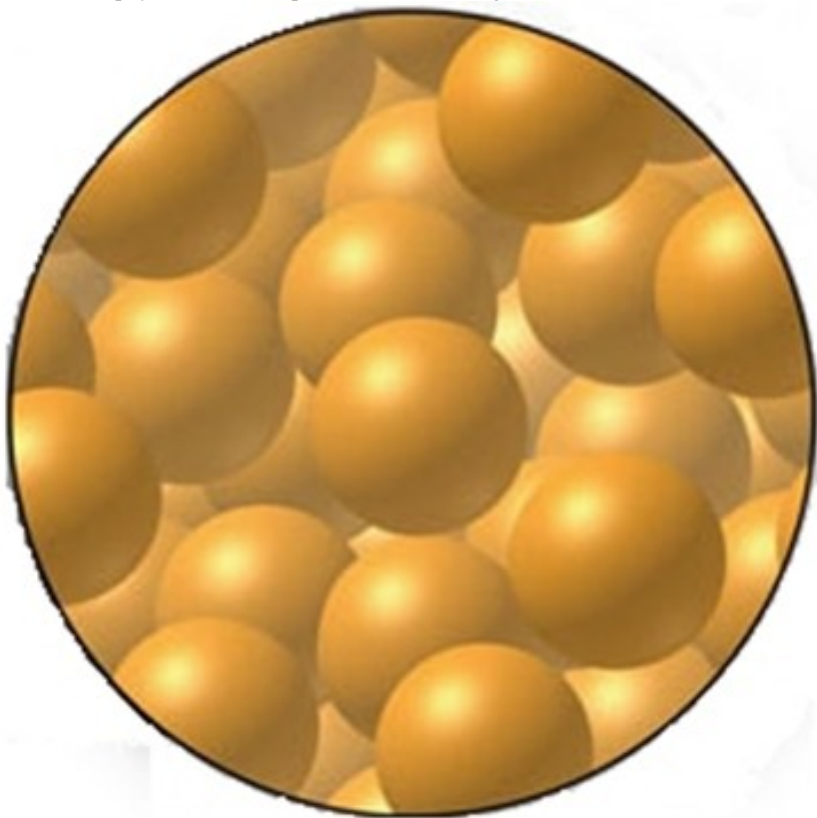
- A. gas
- B. liquid
- C.** solid
- D. mixture

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

29. Which physical state is represented in this image?



- A. mixture
- B. gas
- C. liquid**
- D. solid

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

30. Which of the following statements regarding the solid state of matter is **incorrect**?

- A. The symbol for solid is (s).
- B. Solids consist of particles that do not move past one another.
- C. The particles in a solid are in close contact with one another.
- D. Solids can be compressed to smaller volumes.**
- E. When a solid is heated, the particles begin to move faster.

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

31. Which of the following statements regarding the gaseous state of matter is **incorrect**?

- A. The symbol for a gas is (g).
- B. Gases consist of particles that are in constant random motion.
- C. Gases can be compressed to smaller volumes.
- D. It is possible for gases to mix together.
- E. The particles in a gas are relatively close to one another.**

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

32. A characteristic of a substance that involves the transformations the substance can undergo to produce a different substance is:

- A. a physical property.
- B.** a chemical property.
- C. a physical change.
- D. a material property.
- E. a characteristic property.

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

33. Which of the following statements is **incorrect**?

- A. The condensation of steam on a mirror is an example of a physical change.
- B.** The burning of a piece of charcoal to a white powder is an example of a physical change.
- C. Evaporation of water from a fish tank is evidence of a physical change.
- D. The fact that sulfur is a yellow powder is a physical property.
- E. The fact that copper conducts electricity is a physical property.

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

34. Which of the following statements is **incorrect**?

- A.** The burning of propane in a barbecue grill is a physical change.
- B. The cooking of the meat on a barbecue grill is a chemical change.
- C. Cleaning the grill afterwards using a steel brush is a physical change.
- D. Further cleaning of the grill using a detergent is a chemical change.
- E. Digestion of the meat by your body involves both physical and chemical changes.

Bloom's: 2. Understand

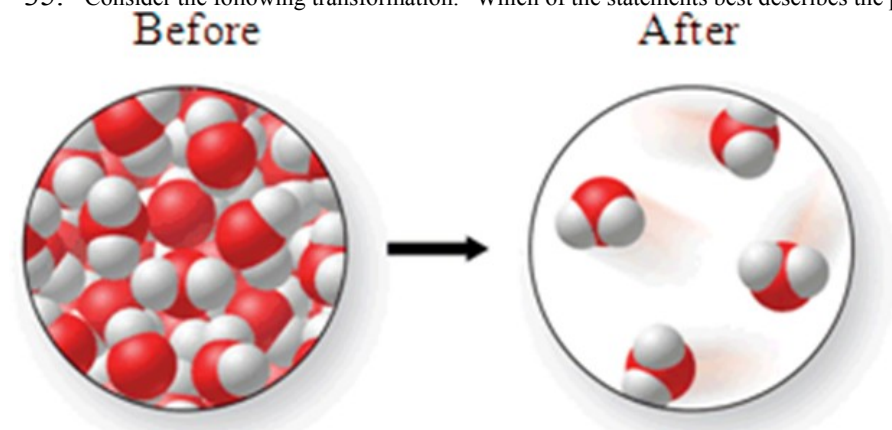
Difficulty: Medium

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

35. Consider the following transformation. Which of the statements best describes the process?



- A. A *chemical* change occurs in which atoms rearrange to form a new compound.
- B. A *chemical* change occurs in which an ionic compound is formed from diatomic elements.
- C. A *chemical* change occurs in which no atoms rearrange to form a new substance.
- D.** A *physical* change occurs in which no atoms rearrange to form a new substance.
- E. A *physical* change occurs in which atoms rearrange to form a new compound.

Bloom's: 2. Understand

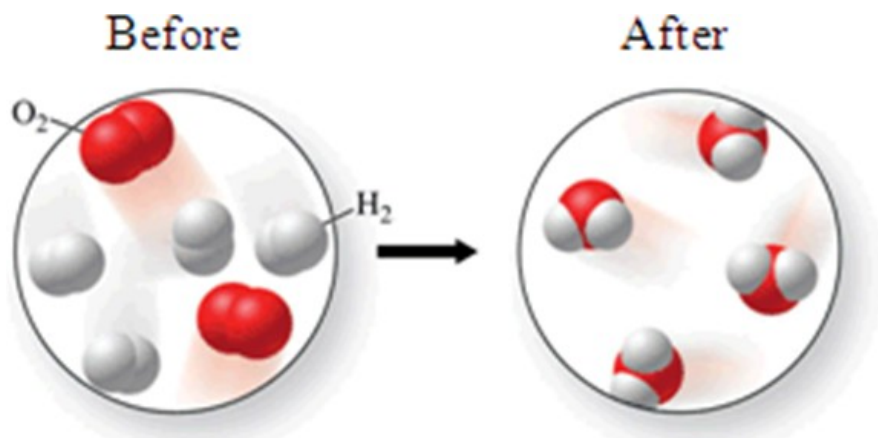
Difficulty: Medium

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

36. Consider the following transformation. Which of the statements best describes the process?



- A. A *physical* change occurs in which no atoms rearrange.  
 B. A *physical* change occurs in which atoms rearrange to form a new compound.  
 C. A *chemical* change occurs in which no atoms rearrange.  
**D.** A *chemical* change occurs in which atoms rearrange to form a new compound.  
 E. A *chemical* change occurs in which an ionic compound is formed from diatomic elements.

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

37. A 1-ounce serving of Cheetos has  $2.90 \times 10^2$  mg of sodium. What is this mass in units of grams?

- A. 290,000 g  
**B.** 0.290 g  
 C. 0.00345 g  
 D. 3.45 g  
 E. 29.0 g

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

38. A brownie contains  $1.30 \times 10^2$  mg of sodium. What is this mass in units of grams?

- A.  $1.30 \times 10^5$  g  
**B.** 0.130 g  
 C. 13.0 g  
 D. 7.69 g  
 E. 0.00769 g

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

39. A 1-ounce serving of a breakfast cereal contains  $1.60 \times 10^2$  mg of potassium. What is this mass in units of grams?

- A.** 0.160 g  
 B.  $1.60 \times 10^5$  g  
 C. 6.25 g  
 D. 0.00625 g  
 E. 16.0 g

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

40. How many pounds of Spaghettios are in a can that contains 418 g? (1 lb = 453.6 g)

- A. 0.0576 lb  
 B.  $1.19 \times 10^4$  lb  
**C.** 0.922 lb

D.  $1.90 \times 10^5$  lb

E.  $3.60 \times 10^{-2}$  lb

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

41. How many pounds of miniature candy bars are in a package that contains 197 g? (1 lb = 453.6 g)

A. 0.0271 lb

**B.** 0.434 lb

C.  $5.59 \times 10^3$  lb

D.  $8.94 \times 10^5$  lb

E.  $1.69 \times 10^{-3}$  lb

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

42. A 1-ounce serving of Doritos has 17 g of carbohydrates. What is this mass in units of ounces? (16 ounces = 453.6 g)

A. 2.7 oz

B. 0.037 oz

**C.** 0.60 oz

D. 480 oz

E. 28 oz

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

43. A can of Spaghettios has a mass of 418 g. What is this mass in units of ounces? (16 ounces = 453.6 g)

A. 0.922 oz

B.  $1.90 \times 10^5$  oz

**C.** 14.8 oz

D.  $1.19 \times 10^4$  oz

E.  $5.76 \times 10^{-2}$  oz

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

44. A package of miniature candy bars has a mass of 197 g. What is this mass in units of ounces? (16 ounces = 453.6 g)

**A.** 6.95 oz

B. 0.434 oz

C.  $8.94 \times 10^4$  oz

D.  $1.43 \times 10^6$  oz

E.  $2.71 \times 10^{-2}$  oz

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

45. A can of cashews has a mass of 8.5 ounces. What is this mass in kg? (16 ounces = 453.6 g)

A. 3900 kg

**B.** 0.24 kg

C. 240 kg

D. 3.9 kg

E. 0.14 kg

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

46. A can of soup has a mass of 10.75 ounces. What is this mass in kg? (16 ounces = 453.6 g)

- A. 304.8 kg
- B.** 0.3048 kg
- C.  $2.370 \times 10^{-2}$  kg
- D.  $1.481 \times 10^{-3}$  kg
- E.  $4.876 \times 10^3$  kg

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

47. A loaf of bread has a mass of 24 ounces. What is this mass in kg? (16 ounces = 453.6 g)

- A.** 0.68 kg
- B. 680 kg
- C.  $5.3 \times 10^{-2}$  kg
- D. 0.85 kg
- E.  $1.7 \times 10^5$  kg

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

48. What is the mass in kilograms of a copper pipe that weighs 12.5 pounds? (1 lb = 453.6 g)

- A. 0.0276 kg
- B. 27.6 kg
- C.  $5.67 \times 10^3$  kg
- D.** 5.67 kg
- E.  $1.72 \times 10^{-3}$  kg

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

49. A typical light-weight bicycle weighs 17.5 pounds. What is the mass of a typical bike in kilograms? (1 lb = 453.6 g)

- A. 0.0386 kg
- B.** 7.94 kg
- C.  $7.94 \times 10^6$  kg
- D.  $1.27 \times 10^5$  kg
- E.  $2.41 \times 10^{-3}$  kg

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

50. A bottle of Gatorade has a volume of 591 mL. What is this volume in L?

- A. 5.91 L
- B. 591,000 L
- C. 0.00169 L
- D. 1.69 L
- E.** 0.591 L

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

51. A bottle of soda has a volume of 474 mL. What is this volume in L?

- A. 4.74 L
- B.** 0.474 L
- C. 47.4 L
- D. 2.11 L

E. 0.00211 L

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

52. A bottle of Gatorade has a volume of 591 mL. What is this volume in fluid ounces? (1 fluid ounce = 29.57 mL)

**A.** 20.0 fl oz

B. 0.0500 fl oz

C.  $1.40 \times 10^5$  fl oz

D. 14.0 fl oz

E. 35 fl oz

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

53. A bottle of soda has a volume of 474 mL. What is this volume in fluid ounces? (1 fluid ounce = 29.57 mL)

**A.** 16.0 fl oz

B. 0.0624 fl oz

C.  $1.75 \times 10^5$  fl oz

D. 17.5 fl oz

E. 30 fl oz

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

54. A bottle of fluoride rinse has a volume of 500 mL. Which of the following equivalences is **incorrect**?

A.  $V = 0.500$  L

B.  $V = 500$  cm<sup>3</sup>

C.  $V = 5.00 \times 10^{-4}$  m<sup>3</sup>

**D.**  $V = 0.500$  m<sup>3</sup>

E. both  $V = 500$  cm<sup>3</sup> and  $V = 0.500$  m<sup>3</sup>

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

55. If the displacement (size) of a motorcycle engine is 1500 cm<sup>3</sup>, which of the following equivalences is **incorrect**?

A.  $V = 1500$  mL

B.  $V = 1.500$  L

C.  $V = 1.500 \times 10^{-3}$  m<sup>3</sup>

**D.**  $V = 15.00$  m<sup>3</sup>

E. both  $V = 1500$  mL and  $V = 15.00$  m<sup>3</sup>

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

56. A box has dimensions of 4.0 cm by 8.5 cm by 2.0 cm. The volume of the box in mL is:

A. 34 mL

B. 0.068 mL

**C.** 68 mL

D. 17 mL

E. 14.5 mL

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

57. A box has dimensions of 2.5 cm by 3.0 cm by 4.0 cm. The volume of the box in milliliters and liters is:



- A.** 30 mL and 0.030 L  
B. 30 mL and 30,000 L  
C. 7.5 mL and 0.0075 L  
D. 7.5 mL and 7,500 L  
E. 3,000 mL and 3.0 L

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

58. A box has dimensions of 3.5 cm by 4.0 cm by 8.0 cm. The volume of the box in milliliters and liters is:

- A. 112 mL and 112,000 L  
**B.** 112 mL and 0.112 L  
C. 0.112 mL and 112 L  
D. 14 mL and 0.014 L  
E. 14 mL and 14,000 L

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

59. The proprietor of a rock shop insists that a nugget is pure gold. If the nugget occupies a volume of 5.40 mL, what would its mass have to be if it were truly pure gold? ( $d_{\text{gold}} = 19.3 \text{ g/mL}$ )

- A.** 104 g  
B. 3.57 g  
C. 0.279 g  
D. 13.9 g  
E. insufficient information given

*Bloom's: 3. Apply*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures, Properties of Matter*

*Topic: Study of Chemistry*

60. If the density of a certain alcohol is 0.785 g/mL, what volume of the alcohol would have a mass of 75.0 g?

- A. 0.955 mL  
B. 58.9 mL  
C. 75.8 mL  
**D.** 95.5 mL  
E. insufficient information given

*Bloom's: 3. Apply*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures, Properties of Matter*

*Topic: Study of Chemistry*

61. The density of aluminum is  $2.7 \text{ g/cm}^3$ . What is the mass of a piece of aluminum foil which is 10.0 cm by 5.0 cm by 0.0018 cm thick?

- A. 0.090 g  
B.  $3.3 \times 10^{-2} \text{ g}$   
**C.** 0.24 g  
D.  $1.4 \times 10^2 \text{ g}$   
E. 19 g

*Bloom's: 3. Apply*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures, Properties of Matter*

*Topic: Study of Chemistry*

62. If the density of a certain alcohol is 0.785 g/mL, what mass of the alcohol would have a volume of 200.0 mL?

- A. 2.55 g  
**B.** 157 g  
C. 200 g  
D. 255 g

E.  $3.92 \times 10^{-3} \text{ g}$

Bloom's: 3. Apply

Difficulty: Easy

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures, Properties of Matter

Topic: Study of Chemistry

63. A student exploring the desert finds a piece of metal with a volume of  $29.9 \text{ cm}^3$ . If this metal has a mass of  $337.5 \text{ g}$ , which of the following is the metal most likely to be?

A. aluminum (density =  $2.70 \text{ g/cm}^3$ )

B. sodium chloride (density =  $2.16 \text{ g/cm}^3$ )

**C.** lead (density =  $11.3 \text{ g/cm}^3$ )

D. gold (density =  $19.3 \text{ g/cm}^3$ )

E. The student discovered a new metal with a density of  $0.0886 \text{ g/cm}^3$ .

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures, Properties of Matter

Topic: Study of Chemistry

64. If a child's balloon filled with helium were heated with a blow-dryer, the balloon would increase in volume. What would happen to the density of the helium in the balloon?

**A.** It would decrease.

B. It would increase.

C. It would remain the same.

D. A chemical reaction would occur, so it is impossible to predict.

E. The initial statement is incorrect—the volume of the balloon would not increase.

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Measurement

Subtopic: Properties of Matter

Topic: Study of Chemistry

65. A rubber stopper sinks in water, but floats in methylene chloride. Place these three substances in order from least density to greatest density.

A. rubber stopper < methylene chloride < water

B. rubber stopper < water < methylene chloride

C. water < methylene chloride < rubber stopper

**D.** water < rubber stopper < methylene chloride

E. methylene chloride < water < rubber stopper

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Measurement

Subtopic: Properties of Matter

Topic: Study of Chemistry

66. A diamond will float in water, but sink in carbon tetrachloride. Place these three substances in order from least density to greatest density.

A. water < diamond < carbon tetrachloride

B. diamond < water < carbon tetrachloride

C. carbon tetrachloride < diamond < water

D. diamond < carbon tetrachloride < water

**E.** water < carbon tetrachloride < diamond

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Measurement

Subtopic: Properties of Matter

Topic: Study of Chemistry

67. An ice cube will sink in hexane, but float in water. Place these three substances in order from least density to greatest density.

A. ice < water < hexane

**B.** hexane < ice < water

C. hexane < water < ice

D. water < hexane < ice

E. water < ice < hexane

*Bloom's: 3. Apply*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Measurement*

*Subtopic: Properties of Matter*

*Topic: Study of Chemistry*

68. If the temperature of a bowl of ice cream increases from  $-10^{\circ}\text{C}$  to  $25^{\circ}\text{C}$ , what is the increase in temperature in units of degrees Celsius and Kelvin?

A.  $15^{\circ}\text{C}$ , 288 K

B.  $35^{\circ}\text{C}$ , 308 K

C.  $35^{\circ}\text{C}$ , 273 K

**D.**  $35^{\circ}\text{C}$ , 35 K

E.  $15^{\circ}\text{C}$ , 273 K

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Measurement*

*Topic: Study of Chemistry*

69. If the temperature of water in a freezer decreases from  $22^{\circ}\text{C}$  to  $-25^{\circ}\text{C}$ , what is the decrease in temperature in units of degrees Celsius and Kelvin?

A.  $47^{\circ}\text{C}$ , 320 K

B.  $47^{\circ}\text{C}$ , 273 K

**C.**  $47^{\circ}\text{C}$ , 47 K

D.  $3^{\circ}\text{C}$ , 276 K

E.  $3^{\circ}\text{C}$ , 3 K

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Measurement*

*Topic: Study of Chemistry*

70. Which of the following is **not** an example of a physical property?

A. The boiling point of acetone is  $56^{\circ}\text{C}$ .

B. Sand is more dense than water.

C. Helium is a gas at room temperature.

**D.** Copper gets a greenish coating on it when exposed to moist air.

E. Water is colorless.

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Properties of Matter*

*Topic: Study of Chemistry*

71. Which of the following is **not** an example of a physical property?

A. The boiling point of liquid nitrogen is 77 K.

B. Nitrogen is a gas at room temperature.

C. Nitrogen is colorless.

D. Nitrogen gas is less dense than oxygen gas.

**E.** Nitrogen combines with oxygen in an internal combustion engine to form oxides of nitrogen.

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Properties of Matter*

*Topic: Study of Chemistry*

72. Which of the following is **not** an example of a chemical property?

A. An iron nail will rust in water.

**B.** Sugar will dissolve in water.

C. A steak on a hot frying pan will turn brown.

D. Gasoline will burn if ignited.

E. Water can be decomposed to hydrogen and oxygen.

*Bloom's: 2. Understand*

*Difficulty: Medium*

Gradable: automatic  
Subtopic: Properties of Matter  
Topic: Study of Chemistry

73. Which of the following is **not** an example of a chemical change?

- A. Water becomes purple as Kool-Aid is dissolved in it.
- B. Aluminum turns white after prolonged exposure to air.
- C. A piece of charcoal becomes white after it burns.
- D. Magnesium burns in air to make magnesium oxide.
- E. Zinc metal reacts with hydrochloric acid to form zinc chloride and hydrogen gas.

Bloom's: 1. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Properties of Matter

Topic: Study of Chemistry

74. Which of the following is **not** an example of a physical change?

- A. Ice melts when warmed.
- B. Dry ice sublimates (converts from a solid to a gas) at room temperature.
- C. Liquid nitrogen converts to a gas at room temperature.
- D. Blue copper sulfate crystals dissolve in water to form a blue solution.

E. When hydrogen and oxygen gas are mixed in the presence of a spark, water is formed.

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Properties of Matter

Topic: Study of Chemistry

75. Which of the following is **not** a form of energy?

- A. chemical
- B. mechanical
- C. temperature
- D. heat
- E. electrical

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Properties of Matter

Topic: Study of Chemistry

76. Which of the following statements is **incorrect**?

- A. Energy is the capacity to do work or transfer heat.
- B. Mechanical work occurs when a force acts over a distance.
- C. Kinetic energy is the energy possessed by an object due to its position.
- D. Potential energy can be possessed by chemical compounds.
- E. A compound releases potential energy when it undergoes a spontaneous chemical reaction.

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Properties of Matter

Topic: Study of Chemistry

77. Which of the following statements is **incorrect**?

- A.  $H_2$  molecules which are moving faster must have more kinetic energy than slower moving  $H_2$  molecules.
- B. A book stored on a high bookshelf has potential energy.
- C. A volleyball flying over a net has both kinetic energy and potential energy.
- D. When gasoline is burned to power an engine, it releases only potential energy.
- E. The water in a waterfall has kinetic, potential, and mechanical energy.

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Properties of Matter

Topic: Study of Chemistry

78. Which of the following is **not** a practice that would be employed by a scientist?

- A. testing ideas by experimentation
- B. organizing findings in specific ways

- C.** predicting the outcome of an experiment and then not testing the prediction
- D. trying to explain why things happen
- E. making physical models to explain the behavior of matter

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Scientific Method*

*Topic: Study of Chemistry*

79. Which of the following is **not** normally a part of scientific inquiry?

- A. observations
- B.** philosophizing
- C. theories
- D. hypotheses
- E. laws

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Scientific Method*

*Topic: Study of Chemistry*

80. Which of the following statements is **incorrect**?

- A. The scientific method is a way of looking at the world that is different from non-science forms of inquiry.
- B. The scientific method does not allow for the use of inferences, and everything must be proved by direct observation.
- C.** A theory is a tentative explanation of the behavior or properties of matter.
- D. Scientists must isolate and study one variable at a time when performing experiments.
- E. A behavior of matter that has universal validity is called a law.

*Bloom's: 2. Understand*

*Difficulty: Medium*

*Gradable: automatic*

*Subtopic: Scientific Method*

*Topic: Study of Chemistry*

81. The number 0.005925 correctly expressed in scientific notation is:

- A.  $59.25 \times 10^{-4}$
- B.  $5.93 \times 10^{-3}$
- C.  $5.9 \times 10^{-3}$
- D.  $5.925 \times 10^3$
- E.**  $5.925 \times 10^{-3}$

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

82. The number 0.0416 correctly expressed in scientific notation is:

- A.  $4.16 \times 10^3$
- B.  $4.2 \times 10^3$
- C.**  $4.16 \times 10^{-2}$
- D.  $4.2 \times 10^{-3}$
- E.  $4.2 \times 10^{-2}$

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

*Subtopic: Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

83. The number 0.0017400 correctly expressed in scientific notation is:

- A.  $1.74 \times 10^3$
- B.  $1.7400 \times 10^3$
- C.  $1.74 \times 10^{-2}$
- D.  $1.74 \times 10^{-3}$
- E.**  $1.7400 \times 10^{-3}$

*Bloom's: 2. Understand*

*Difficulty: Easy*

*Gradable: automatic*

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

84. The number  $5.650 \times 10^{-2}$  correctly expressed in decimal form is:

- A. 0.565
- B. 0.0565
- C. 0.05650**
- D. 565
- E. 565.0

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

85. The number 54,900 correctly expressed in scientific notation is:

- A.  $5.49 \times 10^4$**
- B.  $54.9 \times 10^3$
- C.  $5.49 \times 10^{-3}$
- D.  $5.5 \times 10^4$
- E.  $5.49 \times 10^{-4}$

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

86. The number 625,000 correctly expressed in scientific notation is:

- A.  $6.25 \times 10^{-5}$
- B.  $6.25 \times 10^{-4}$
- C.  $6.3 \times 10^5$
- D.  $6.2 \times 10^5$
- E.  $6.25 \times 10^5$**

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

87. The correct answer for the product  $(6.45 \times 10^5) \times (1.2 \times 10^4)$  is: (considering significant figures)

- A.  $7.7 \times 10^9$**
- B.  $5.375 \times 10^1$
- C.  $7.74 \times 10^9$
- D.  $7.7 \times 10^{11}$
- E.  $7.74 \times 10^{11}$

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

88. The correct answer for the product  $(8.2 \times 10^{-3}) \times (2.84 \times 10^5)$  is: (considering significant figures)

- A.  $2.3288 \times 10^3$
- B.  $2.3 \times 10^3$**
- C.  $2.3 \times 10^4$
- D.  $2.3 \times 10^5$
- E.  $2.33 \times 10^2$

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

89. The correct answer for the product  $(6.1 \times 10^4) \times (3312)$  is: (considering significant figures)

- A.  $2.020 \times 10^8$
- B.  $2.02 \times 10^8$
- C.  $2.0 \times 10^9$

D.  $2.02032 \times 10^8$

**E.**  $2.0 \times 10^8$

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

90. What is the correct answer to the following mathematical operation expressed to the appropriate number of significant figures?

$$\left(3.225 \times 10^{19}\right) \times \left(\frac{0.01}{7.3 \times 10^{-3}}\right)$$

**A.**  $4 \times 10^{19}$

B.  $4.4 \times 10^{19}$

C.  $4.42 \times 10^{19}$

D.  $4.418 \times 10^{19}$

E.  $4.42 \times 10^{18}$

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

91. What is the correct answer to the following mathematical operation expressed to the appropriate number of significant figures?

$$\frac{0.040}{\left(2.6345 \times 10^{-4}\right) \times (7.91)}$$

A.  $12.0 \times 10^4$

B. 1.9

**C.** 19

D. 19.1

E. 19.195

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

92. When the mathematical operation is carried out, how many significant figures should be reported in the answer?

$$\frac{0.040}{\left(2.6345 \times 10^{-4}\right) \times (7.91)}$$

A. 1

**B.** 2

C. 3

D. 4

E. 5

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

93. When the mathematical operation is carried out, how many significant figures should be reported in the answer?

$$\left(3.225 \times 10^{19}\right) \times \left(\frac{0.01}{7.3 \times 10^{-3}}\right)$$

**A.** 1

B. 2

C. 3

D. 4

E. 5

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

94. The correct answer for the subtraction  $28.645 \text{ g} - 22.105 \text{ g}$  is: (considering significant figures)

A. 6.54 g

B.  $6.54 \times 10^{-1}$  g

**C.** 6.540 g

D. 6.5400 g

E.  $6.54 \times 10^1$  g

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

95. The correct answer for the addition  $56.234 + 0.0021$  g is: (considering significant figures)

A. 56 g

B. 56.24 g

C. 56.2361 g

**D.** 56.236 g

E. 56.255 g

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

96. The correct answer for the addition  $102.5 \text{ mL} + 6.55 \text{ mL}$  is: (considering significant figures)

A. 109.05 mL

B. 109 mL

**C.** 109.0 mL

D. 109.050 mL

E. 108.15 mL

Bloom's: 2. Understand

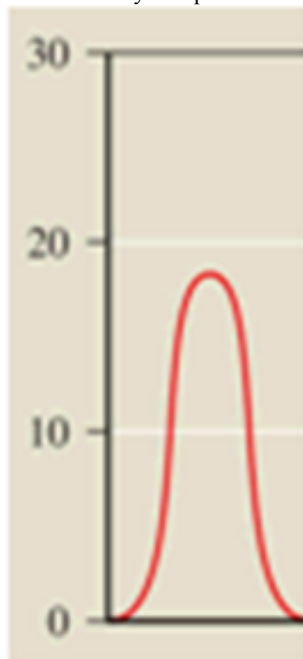
Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

97. How would you report the value at the peak of the graph shown below assuming the y-axis is in units of



cm?

**A.** 18 cm

B. 18.0 cm

C. 18.00 cm

D. 20 cm

E. 20.0 cm

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic



Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

98. If a jet's cruising altitude is 32,200 ft (to three significant figures), this distance in km is: (1 mile = 1.61 km; 1 mile = 5280 ft)

- A. 9.8186 km
- B. 9.82 km**
- C.  $1.06 \times 10^8$  km
- D.  $2.737 \times 10^8$  km
- E.  $2.00 \times 10^4$  km

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

99. If a car is traveling at 97 km/hr, what is its speed in mi/hr? (1 mile = 1.61 km)

- A.  $1.6 \times 10^2$  mi/hr
- B. 156 mi/hr
- C. 60.2 mi/hr
- D.  $6.0 \times 10^2$  mi/hr**
- E. 3600 mi/hr

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

100. The American Heart Association recommends that for every 1000 dietary calories consumed, the sodium intake should be 1000 mg or less and should not exceed a daily limit of 3300 mg for an adult. What is the yearly limit on sodium intake in pounds?

- A.  $7.3 \times 10^{-3}$  lb
- B. 2.7 lb**
- C. 730 lb
- D.  $1.2 \times 10^3$  lb
- E.  $1.2 \times 10^6$  lb

Bloom's: 3. Apply

Difficulty: Hard

Gradable: automatic

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

101. Water is considered a mixture because it consists of hydrogen and oxygen.

**FALSE**

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Classification and States of Matter, Chemical Formulas

Topic: Study of Chemistry, Components of Matter

102. The larger the sample of a given substance, the more dense it is.

**FALSE**

Bloom's: 1. Remember

Difficulty: Medium

Gradable: automatic

Subtopic: Measurement

Topic: Study of Chemistry

103. A glass of tea with ice cubes in it is an example of a heterogeneous mixture.

**TRUE**

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Classification and States of Matter

Topic: Study of Chemistry

104. A "law" in science is a rule that is enacted by a group of influential scientists.

**FALSE**

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Method

Topic: Study of Chemistry

105. The law of conservation of mass states that the mass of the products of a chemical reaction is equal to the mass of the reacting substances.

**TRUE**

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Method

Topic: Study of Chemistry

106. Scientific theories are explanations of natural behavior.

**TRUE**

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Method

Topic: Study of Chemistry

107. The symbol (w) means "dissolved in water."

**FALSE**

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Classification and States of Matter

Topic: Study of Chemistry

108. The symbol  $\text{H}_2\text{O}(aq)$  is the normal way to represent the compound water.

**FALSE**

Bloom's: 1. Remember

Difficulty: Easy

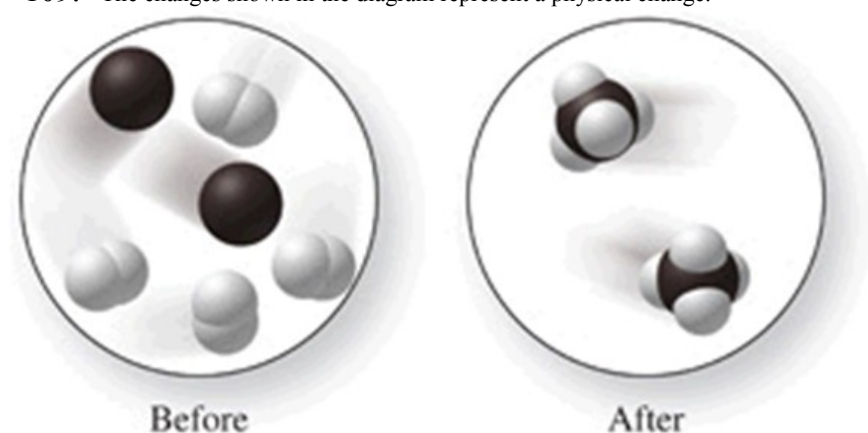
Gradable: automatic

Subtopic: Classification and States of Matter, Chemical Formulas

Topic: Components of Matter

Topic: Study of Chemistry

109. The changes shown in the diagram represent a physical change.



**FALSE**

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Classification and States of Matter, Properties of Matter

Topic: Study of Chemistry

110. If the number 6.2510 is rounded to 2 significant figures, it would be reported as 6.3.

**TRUE**

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Measurement, Scientific Notation and Significant Figures

Topic: Study of Chemistry

111. The symbol for the element sodium is S.

**FALSE**

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table, Chemical Formulas

Topic: Components of Matter

112. The symbol for the element cobalt is CO.

**FALSE**

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table, Chemical Formulas

Topic: Components of Matter

113. A bottle of liquid mercury has a mass of  $5.00 \times 10^2$  g. What is the volume of the mercury in mL? ( $d_{\text{mercury}} = 13.6$  g/mL)

Bloom's: 3. Apply

Difficulty: Medium

Gradable: manual

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures, Properties of Matter

Topic: Study of Chemistry

114. Pentane has a boiling point of  $36^\circ\text{C}$ . What is this temperature equivalent to in kelvins?

Bloom's: 2. Understand

Difficulty: Easy

Gradable: manual

Subtopic: Measurement

Topic: Study of Chemistry

115. A pump for a small swimming pool will circulate  $3.00 \times 10^2$  gallons per hour (gph) through the filter. If the pool contains  $1.30 \times 10^3$  gallons of water, how many hours will it take to filter the entire contents of the pool?

Bloom's: 3. Apply

Difficulty: Medium

Gradable: manual

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

116. If the price of gasoline is \$4.25/gallon, what would the price be per liter of gasoline? (1 L = 1.057 qt., 4 qt. = 1 gal.)

Bloom's: 3. Apply

Difficulty: Medium

Gradable: manual

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

117. The samples shown in the figure have the same mass. Which one has the greater density, the one on the left or the one on the right?



Bloom's: 3. Apply

Difficulty: Medium

Gradable: manual

Subtopic: Measurement

Subtopic: Properties of Matter

Topic: Study of Chemistry

118. The length of a sofa is 2.05 m. Convert this length to units of cm.

Bloom's: 2. Understand

Difficulty: Easy

Gradable: manual

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

119. The length of a sofa is 2.05 m. Convert this length to units of mm.

Bloom's: 2. Understand

Difficulty: Easy

Gradable: manual

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

120. The length of a sofa is 2.05 m. Convert this length to units of km.

Bloom's: 2. Understand

Difficulty: Easy

Gradable: manual

Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures

Topic: Study of Chemistry

121. The density of iron is  $7.9$  g/cm<sup>3</sup>. If  $453.6$  g = 1 pound, what is this mass in pounds?

Bloom's: 2. Understand

*Difficulty: Easy*

*Gradable: manual*

*Subtopic: Measurement, Dimensional Analysis, Scientific Notation and Significant Figures*

*Topic: Study of Chemistry*

# Chapter 01 Test Bank: Matter and Energy **Summary**

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Bloom's: 2. Understand	85
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Difficulty: Hard	1
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