Chapter 1 Chemistry: The Central Science

1. What is a unifying principle that explains a body of experimental observations?
   A) law B) hypothesis C) theory D) phenomena E) prediction
   Ans: C Bloom's Taxonomy: 1 Difficulty: easy

2. What term is a tentative explanation for observations that are made that result in the formulation of this concept?
   A) law B) hypothesis C) theory D) phenomena E) prediction
   Ans: B Bloom's Taxonomy: 1 Difficulty: easy

3. What is the term used for findings that are summarized based on a pattern or trend?
   A) law B) hypothesis C) theory D) phenomena E) prediction
   Ans: A Bloom's Taxonomy: 1 Difficulty: easy

4. Which of the following activities is not a part of good science?
   A) proposing a theory
   B) developing a hypothesis
   C) making quantitative observations
   D) designing experiments
   E) indulging in speculation
   Ans: E Bloom's Taxonomy: 2 Difficulty: moderate

5. Which one of the following is a "substance" in the sense of the word as used in your textbook?
   A) air B) tap water C) seawater D) water E) toothpaste
   Ans: D Bloom's Taxonomy: 2 Difficulty: moderate

6. Which of the following cannot be separated into a simpler substance by chemical means?
   A) element
   B) emulsion
   C) compound
   D) homogeneous mixture
   E) heterogeneous mixture
   Ans: A Bloom's Taxonomy: 1 Difficulty: easy

7. If a liquid contains 60% sugar and 40% water throughout its composition then what is it called?
   A) solute
   B) compound
   C) homogeneous mixture
   D) heterogeneous mixture
   E) solvent
   Ans: C Bloom's Taxonomy: 2 Difficulty: moderate

8. Which of the following does not have a uniform composition throughout?
   A) element
   B) compound
   C) homogeneous mixture
   D) heterogeneous mixture
   E) solvent
   Ans: D Bloom's Taxonomy: 1 Difficulty: easy

9. Which of the following is not an S.I. base unit?
   A) meter B) ampere C) second D) gram E) Kelvin
   Ans: D Bloom's Taxonomy: 1 Difficulty: easy

10. The S.I. base unit of mass is
    A) mg. B) g. C) kg. D) metric ton. E) lb.
    Ans: C Bloom's Taxonomy: 1 Difficulty: easy

11. The S.I. prefix mega– (M) means
    A) 10^{-6}. B) 10^{-3}. C) 10^{3}. D) 10^{6}. E) 10^{9}.
    Ans: D Bloom's Taxonomy: 1 Difficulty: easy

12. The S.I. prefixes milli– and mega– represent, respectively:
    A) 10^{6} and 10^{-6}.
    B) 10^{-3} and 10^{6}.
    C) 10^{3} and 10^{-6}.
    D) 10^{-3} and 10^{9}.
    E) 10^{-6} and 10^{-3}.
    Ans: B Bloom's Taxonomy: 1 Difficulty: easy

13. How many micrograms are in 65.3 kg?
    A) 0.653 μg
    B) 6.53×10^{7} μg
    C) 6.53×10^{4} μg
    D) 6.53×10^{-8} μg
    E) 6.53×10^{10} μg
    Ans: E Bloom's Taxonomy: 3 Difficulty: moderate

14. A dose of medication was prescribed to be 35 microliters. Which of the following expresses that volume in centiliters?
    A) 3.5×10^{5} cL
    B) 3.5×10^{4} cL
    C) 3.5 cL
    D) 3.5×10^{-4} cL
    E) 3.5×10^{-3} cL
    Ans: E Bloom's Taxonomy: 3 Difficulty: moderate

15. How many milliliters is 0.0055 L?
    A) 0.55 mL B) 5.5 mL C) 0.5 mL D) 0.0000055 mL E) 182 mL
    Ans: B Bloom's Taxonomy: 3 Difficulty: moderate

16. How many hertz is 600.11 MHz?
    A) 6.0011×10^{-4} Hz
    B) 60.011 Hz
    C) 6.0011×10^{6} Hz
    D) 6.0011×10^{-2} Hz
    E) 6.0011×10^{8} Hz
    Ans: E Bloom's Taxonomy: 3 Difficulty: moderate

17. The distance between carbon atoms in ethylene is 134 picometers. Which of the following expresses that distance in meters?
    A) 1.34×10^{-13} m
    B) 1.34×10^{-12} m
    C) 1.34×10^{-10} m
    D) 1.34×10^{-7} m
    E) 1.34×10^{-6} m
    Ans: C Bloom's Taxonomy: 3 Difficulty: moderate

18. Which of these quantities represents the largest mass?
    A) 2.0×10^{2} mg
    B) 0.0010 kg
    C) 1.0×10^{5} μg
    D) 2.0×10^{2} cg
    E) 10.0 dg
    Ans: D Bloom's Taxonomy: 3 Difficulty: difficult

19. The mass of a sample is 550 milligrams. Which of the following expresses that mass in kilograms?
    A) 5.5×10^{8} kg
    B) 5.5×10^{5} kg
    C) 5.5×10^{-4} kg
    D) 5.5×10^{-6} kg
    E) 5.5×10^{-1} kg
    Ans: C Bloom's Taxonomy: 3 Difficulty: moderate

20. The diameter of Earth is 12.7 Mm. Express this diameter in centimeters.
    A) 1.27×10^{5} cm
    B) 1.27×10^{6} cm
    C) 1.27×10^{7} cm
    D) 1.27×10^{8} cm
    E) 1.27×10^{9} cm
    Ans: E Bloom's Taxonomy: 3 Difficulty: moderate

21. How many mm^3 are in $16.7cm^3$?
    A) 1.67×10^{-5} mm^3
    B) 1.67×10^{-8} mm^3
    C) 1.67×10^{7} mm^3
    D) 1.67×10^{4} mm^3
    E) 1.67×10^{-4} mm^3
    Ans: D Bloom's Taxonomy: 3 Difficulty: difficult

22. A patient in the hospital is running a temperature of 39.5°C, what is this in Fahrenheit?
    A) 99°F B) 101.3°F C) 102.4°F D) 103.1°F E) 104°F
    Ans: D Bloom's Taxonomy: 3 Difficulty: moderate

23. If normal body temperature is 98.6 °F then what is this in Celsius?
    A) 34°C B) 35.5°C C) 36.4°C D) 37°C E) 38.7°C
    Ans: D Bloom's Taxonomy: 3 Difficulty: moderate

24. Express 122°F in °C.
A) 50.0°C B) 64.4°C C) 67.8°C D) 162.0°C E) 219.6°C
Ans: A Bloom's Taxonomy: 3 Difficulty: moderate

25. The boiling point for liquid helium is 4 K, what is the temperature in Fahrenheit?
A) –452.5°F B) –498.9°F C) –237.2°F D) 131.8°F E) 530.9°F
Ans: A Bloom's Taxonomy: 3 Difficulty: moderate

26. If the temperature is 38°F then what is the temperature in Kelvin?
A) 3.33 K B) 100.4 K C) 276.5 K D) 311.15 K E) 235.15 K
Ans: C Bloom's Taxonomy: 3 Difficulty: moderate

27. Dry ice (carbon dioxide) changes from a solid to a gas at –78.5°C. What is this temperature in °F?
A) –173°F
B) –12.6°F
C) –109°F
D) –75.6°F
E) None of the above are within 2°F of the right answer.
Ans: C Bloom's Taxonomy: 3 Difficulty: moderate

28. The boiling point for liquid nitrogen is 77 K, what is the temperature in Fahrenheit?
A) –126.8°F B) –288.8°F C) –3211°F D) 176.8°F E) 662.3°F
Ans: C Bloom's Taxonomy: 3 Difficulty: moderate

29. Acetone, which is used as a solvent and as a reactant in the manufacture of Plexiglas®, boils at 56.1°C. What is the boiling point in degrees Fahrenheit?
A) 159°F B) 133°F C) 101°F D) 69.0°F E) 43.4°F
Ans: B Bloom's Taxonomy: 3 Difficulty: moderate

30. Isopropyl alcohol, commonly known as rubbing alcohol, boils at 82.4°C. What is the boiling point in Kelvin?
A) 387.6 K B) 355.6 K C) 323.6 K D) 190.8 K E) –190.8 K
Ans: B Bloom's Taxonomy: 3 Difficulty: moderate

31. Acetic acid boils at 244.2°F. What is its boiling point in degrees Celsius?
A) 382.0°C B) 167.7°C C) 153.4°C D) 117.9°C E) 103.7°C
Ans: D Bloom's Taxonomy: 3 Difficulty: moderate

32. What is the volume of a container that contains 14.3 g of a substance having a density of 0.988 g/cm^3?
A) 14.1 cm^3 B) 0.0691 cm^3 C) 14.5 cm^3 D) 141 cm^3 E) 691 cm^3
Ans: C Bloom's Taxonomy: 3 Difficulty: easy

33. If you have a graduated cylinder containing 15.5 mL and this volume changes to 95.2 mL after a metal with a mass of 7.95 g is dropped into the cylinder, what is the density of this metal?
A) 0.0835 g/mL
B) 0.513 g/mL
C) 0.0718 g/mL
D) 10.0 g/mL
E) 9.97×10^{-2} g/mL
Ans: E Bloom's Taxonomy: 3 Difficulty: moderate

34. Iron has a density of 7.87 g/cm^3. What mass of iron would be required to cover a football playing surface of 120 yd × 60 yd to a depth of 1.0 mm? (1 in = 2.54 cm)
A) 76 kg B) 47 Mg C) 7.6×10^5 g D) 4.7×10^8 g E) 1.9×10^7 g
Ans: B Bloom's Taxonomy: 3 Difficulty: difficult

35. An empty flask's mass is 17.4916 g and its mass is 43.9616 g when filled with water at 20.0°C (d = 0.9982 g/mL). The density of "heavy water" at 20.0°C is 1.1053 g/mL. What is the mass of the flask when filled with heavy water at 20.0°C?
A) 29.2573 g B) 46.8016 g C) 46.7489 g D) 29.3100 g E) 43.9140 g
Ans: B Bloom's Taxonomy: 3 Difficulty: difficult

36. A flask has a mass of 78.23 g when empty and 593.63 g when filled with water. When the same flask is filled with concentrated sulfuric acid, H_2SO_4, its mass is 1026.57 g. What is the density of concentrated sulfuric acid? (Assume water has a density of 1.00 g/cm^3 at the temperature of the measurement.)
A) 1.992 g/cm^3
B) 1.840 g/cm^3
C) 1.729 g/cm^3
D) 1.598 g/cm^3
E) 0.543 g/cm^3
Ans: B Bloom's Taxonomy: 3 Difficulty: moderate

37. Talc is a mineral that has low conductivity for heat and electricity and is not attacked by acid. It is used as talcum powder and face powder. A sample of talc weighs 35.97 g in air and 13.65 g in mineral oil (d = 1.75 g/cm^3). What is the density of talc?
A) 4.61 g/cm^3
B) 2.82 g/cm^3
C) 2.63 g/cm^3
D) 2.44 g/cm^3
E) 1.61 g/cm^3
Ans: A Bloom's Taxonomy: 3 Difficulty: moderate

38. Which of the following is a *chemical* change?
A) boiling water
B) melting wax
C) broiling a steak on a grill
D) condensing water vapor into rainfall
E) carving a piece of wood
Ans: C Bloom's Taxonomy: 2 Difficulty: moderate

39. Which of these is an example of a *physical* property?
    A) corrosiveness of sulfuric acid
    B) toxicity of cyanide
    C) flammability of gasoline
    D) neutralization of stomach acid with an antacid
    E) lead becomes a liquid when heated to 601°C
    Ans: E Bloom's Taxonomy: 2 Difficulty: moderate

40. Which one of these represents a *physical* change?
    A) water, when heated, forms steam
    B) bleach turns hair yellow
    C) sugar, when heated, becomes brown
    D) milk turns sour
    E) apples, when exposed to air, turn brown
    Ans: A Bloom's Taxonomy: 2 Difficulty: moderate

41. Which one of these represents a *chemical* change?
    A) boiling water to form steam
    B) turning hair yellow with bleach
    C) melting butter
    D) mixing powdered charcoal and oxygen at room temperature
    E) cutting a bar of sodium metal into pieces with a knife
    Ans: B Bloom's Taxonomy: 2 Difficulty: moderate

42. Which of the following is an extensive property of oxygen?
    A) boiling point
    B) temperature
    C) average kinetic energy of molecules
    D) density
    E) mass
    Ans: E Bloom's Taxonomy: 1 Difficulty: easy

43. When the value of something does not depend on the amount of the matter then what is this called?
    A) empirical property
    B) intensive property
    C) inclusive property
    D) extensive property
    E) exclusive property
    Ans: B Bloom's Taxonomy: 1 Difficulty: easy

44. Which of the following is an extensive property?
    A) density B) temperature C) mass D) specific heat E) pressure
    Ans: C Bloom's Taxonomy: 1 Difficulty: easy

45. The number 1.050×10^9 has how many significant figures?
    A) 2 B) 3 C) 4 D) 9 E) 13
    Ans: C Bloom's Taxonomy: 2 Difficulty: easy

46. How many significant figures are in 0.006570?
A) 3 B) 4 C) 5 D) 6 E) 7
Ans: B Bloom's Taxonomy: 2 Difficulty: easy

47. After carrying out the operations below, how many significant figures are appropriate to show in the result? (13.7 + 0.027) ÷ 8.221
A) 1 B) 2 C) 3 D) 4 E) 5
Ans: C Bloom's Taxonomy: 3 Difficulty: difficult

48. The result of (3.8621 × 1.5630) – 5.98 is properly written as
A) 0.06 B) 0.056 C) 0.0565 D) 0.05646 E) 0.056462
Ans: A Bloom's Taxonomy: 3 Difficulty: difficult

49. Select the answer with the correct number of decimal places for the following sum:
13.914 cm + 243.1 cm + 12.00460 cm =
A) 269.01860 cm
B) 269.0186 cm
C) 269.019 cm
D) 269.02 cm
E) 269.0 cm
Ans: E Bloom's Taxonomy: 3 Difficulty: moderate

50. How many significant figures does the sum 8.5201 + 1.93 contain?
A) 1 B) 2 C) 3 D) 4 E) 5
Ans: D Bloom's Taxonomy: 2 Difficulty: moderate

51. Select the answer that expresses the result of this calculation with the correct number of significant figures.

$$\frac{13.602 \times 1.90 \times 3.06}{4.2 \times 1.4097}$$

A) 13.3568 B) 13.357 C) 13.36 D) 13.4 E) 13
Ans: E Bloom's Taxonomy: 3 Difficulty: difficult

52. The average distance between the Earth and the moon is 240,000 miles. Express this distance in kilometers. (1 mi = 1609 m)
A) 6.1×10^5 km
B) 5.3×10^5 km
C) 3.9×10^5 km
D) 1.5×10^5 km
E) 9.4×10^4 km
Ans: C Bloom's Taxonomy: 3 Difficulty: difficult

53. How many inches are in 382.5 cm? (1 in = 2.54 cm)
A) 150.6 in B) 6.641×10^{-3} in C) 151 in D) 971.6 in E) 972 in
Ans: A Bloom's Taxonomy: 3 Difficulty: moderate

54. How many cubic inches are in 1.00 liter? (1 in = 2.54 cm)
A) 61.0 in^3 B) 155 in^3 C) 394 in^3 D) 1.64×10^4 in^3 E) none of the above
Ans: A Bloom's Taxonomy: 3 Difficulty: difficult

55. Convert 500 milliliters to quarts. (1 L = 1.06 qt)
A) 1.88 qt B) 0.472 qt C) 0.528 qt D) 4.72×10^5 qt E) 5.28×10^5 qt
Ans: C Bloom's Taxonomy: 3 Difficulty: moderate

56. Given that 1 in = 2.54 cm, 1 cm^3 is equal to
A) 16.4 in^3. B) 6.45 in^3. C) 0.394 in^3. D) 0.155 in^3. E) 0.0610 in^3.
Ans: E Bloom's Taxonomy: 3 Difficulty: moderate

57. A large pizza has a diameter of 15 inches. Express this diameter in centimeters. (1 in = 2.54 cm)
A) 38 cm B) 24 cm C) 18 cm D) 9.3 cm E) 5.9 cm
Ans: A Bloom's Taxonomy: 3 Difficulty: moderate

58. What is the volume in milliliters of a 32.0 oz can of juice? (1 fl oz = 29.6 mL)
A) 1.08 mL B) 947 mL C) 0.925 mL D) 0.95 mL E) 1.1 mL
Ans: B Bloom's Taxonomy: 3 Difficulty: moderate

59. The speed needed to escape the pull of Earth's gravity is 11.3 km/s. What is this speed in mi/h? (1 mi = 1609 m)
A) 65,500 mi/h
B) 25,300 mi/h
C) 18,200 mi/h
D) 1090 mi/h
E) 5.02×10^{-3} mi/h
Ans: B Bloom's Taxonomy: 3 Difficulty: difficult

60. The density of mercury, the only metal to exist as a liquid at room temperature, is 13.6 g/cm^3. What is that density in pounds per cubic inch? (1 in = 2.54 cm; 1 lb = 454 g)
A) 849 lb/in^3
B) 491 lb/in^3
C) 376 lb/in^3
D) 0.491 lb/in^3
E) 1.83×10^{-3} lb/in^3
Ans: D Bloom's Taxonomy: 3 Difficulty: difficult

61. Some molecules move with speeds approaching the "escape velocity" from Earth, which is 7.0 miles per second. What is this speed in cm/h? (1 mi = 1609 m)
A) 313 cm/h
B) 4.1×10^5 cm/h
C) 4.1×10^9 cm/h
D) 1.1×10^6 cm/h
E) 1.6×10^9 cm/h
Ans: C Bloom's Taxonomy: 3 Difficulty: moderate

62. The city of Los Angeles is now approximately 2400 miles south of Alaska. It is moving slowly northward as the San Andreas Fault continues to slide. If Los Angeles is to arrive near Anchorage, Alaska, in 76 million years, at what average rate will it have to move in mm per month? (1 mi = 1609 m)
A) 2.0×10^{-10} mm/mo
B) 6.6×10^{-6} mm/mo
C) 4.2 mm/mo
D) 9.5 mm/mo
E) 51 mm/mo
Ans: C Bloom's Taxonomy: 3 Difficulty: difficult

63. Which of the following speeds is the greatest? (1 mi = 1609 m)
A) 40 mi/h
B) 2.0×10^{5} mm/min
C) 40 km/h
D) 0.74 km/min
E) 400 m/min
Ans: A Bloom's Taxonomy: 3 Difficulty: difficult

64. The speed needed to escape the pull of Earth's gravity is 11.3 km/s. What is this speed in mi/h? (1 mi = 1609 m)
A) 65,500 mi/h
B) 25,300 mi/h
C) 18,200 mi/h
D) 1090 mi/h
E) 5.02×10^{-3} mi/h
Ans: B Bloom's Taxonomy: 3 Difficulty: moderate

65. You prepare 1000 mL of tea and transfer it to a 1.00 quart pitcher for storage. Which of the following statements is true? (1 L = 1.06 qt)
A) The pitcher will be filled to 100% of its capacity with no tea spilled.
B) The pitcher will be filled to about 95% of its capacity.
C) The pitcher will be filled to about 50% of its capacity.
D) The pitcher will be completely filled and a small amount of tea will overflow.
E) The pitcher will be completely filled and most of the tea will overflow.
Ans: D Bloom's Taxonomy: 4 Difficulty: moderate

66. Radio waves travel at the speed of light which is 3.00×10^{8} m/s. How many minutes does it take for a radio message to reach Earth from Saturn if Saturn is 7.9×10^{8} km from Earth?
A) 4.4×10^{-2} min
B) 1.6×10^{5} min
C) 4.0×10^{15} min
D) 44 min
E) 2.6 min
Ans: D Bloom's Taxonomy: 3 Difficulty: difficult

67. Radio waves travel at the speed of light which is 3.00×10^{8} m/s. How many kilometers will radio messages to outer space travel in exactly one year?
A) 9.46×10^{15} km
B) 7.30×10^{8} km
C) 7.10×10^{10} km
D) 9.46×10^{12} km
E) 3.33×10^{-3} km
Ans: D Bloom's Taxonomy: 3 Difficulty: difficult

68. True or False: Matter is anything that has mass and occupies space.
Ans: True Bloom's Taxonomy: 1 Difficulty: easy

69. True or False: When applying the scientific method, it is important to avoid any form of hypothesis.
Ans: False Bloom's Taxonomy: 2 Difficulty: moderate

70. True or False: When applying the scientific method, a model or theory should be based on experimental data.
Ans: True Bloom's Taxonomy: 2 Difficulty: easy

71. True or False: A dip of vanilla ice cream is a pure substance.
Ans: False Bloom's Taxonomy: 2 Difficulty: moderate

72. True or False: The juice from an orange is a mixture.
Ans: True Bloom's Taxonomy: 2 Difficulty: moderate

73. True or False: A particular temperature in degrees Celsius is larger than the temperature in Kelvin.
Ans: False Bloom's Taxonomy: 2 Difficulty: moderate

74. True or False: Zero Kelvin $< 0^{\circ}$ Fahrenheit $< 0^{\circ}$ Celsius.
Ans: True Bloom's Taxonomy: 3 Difficulty: difficult

75. True or False: 77 K is colder than 4 K.
Ans: False Bloom's Taxonomy: 2 Difficulty: moderate

76. True or False: Rusting of a piece of iron under environmental conditions is a physical change.
Ans: False Bloom's Taxonomy: 2 Difficulty: moderate

77. True or False: The ripening of fruit, once picked, is an example of physical change.
Ans: False Bloom's Taxonomy: 2 Difficulty: moderate

78. True or False: The density of a substance is an intensive property.
Ans: True Bloom's Taxonomy: 1 Difficulty: easy

79. True or False: The volume of a substance is an intensive property.
Ans: False Bloom's Taxonomy: 1 Difficulty: easy

80. True or False: Boiling point and melting point are extensive properties.
Ans: False Bloom's Taxonomy: 1 Difficulty: easy

81. True or False: The number 6.0448, rounded to 3 decimal places, becomes 6.045.
Ans: True Bloom's Taxonomy: 2 Difficulty: moderate

82. What is something that has a definite composition?
    Ans: pure substance
    Bloom's Taxonomy: 1 Difficulty: easy

83. What is a combination of two or more substances in which the substances retain their distinct identities?
    Ans: mixture
    Bloom's Taxonomy: 1 Difficulty: easy

84. What is a substance that cannot be separated into simpler substances by chemical means?
    Ans: element
    Bloom's Taxonomy: 1 Difficulty: easy

85. What is a substance composed of atoms of two or more elements chemically united in fixed proportions?
    Ans: compound
    Bloom's Taxonomy: 1 Difficulty: easy

86. What is the equation for the conversion of Celsius to Kelvin?
    Ans: $^{\circ}C + 273.15 = \text{Kelvin}$
    Bloom's Taxonomy: 1 Difficulty: easy

87. What is the equation used to calculate the mass from the density?
    Ans: mass = density × volume or $m = dv$
    Bloom's Taxonomy: 1 Difficulty: easy

88. Give examples of three physical properties.
    Ans: (Answers will vary.) melting point, boiling point, density, color
    Bloom's Taxonomy: 1 Difficulty: moderate

89. Identify this process as a *physical* or *chemical* change: bacteria converts milk to yogurt.
    Ans: chemical
    Bloom's Taxonomy: 2 Difficulty: moderate

90. Give an example of an *extensive* property.
    Ans: (Answers will vary.) mass, length, volume
    Bloom's Taxonomy: 1 Difficulty: easy

91. Give an example of an *intensive* property.
    Ans: (Answers will vary.) temperature, density, melting point, boiling point
    Bloom's Taxonomy: 1 Difficulty: easy

92. If two numbers are added together, and one has 2 digits after the decimal point and the other has 1 digit after the decimal point, explain how to round the answer.
    Ans: The answer will have 1 digit after the decimal point because the least number of digits after the decimal point in the two numbers used in the calculation was 1. Use the least number of digits after the decimal point.
    Bloom's Taxonomy: 3 Difficulty: moderate

93. If two numbers are multiplied together, and one has 3 significant figures and the other has 4 significant figures, explain how to round the answer.
    Ans: The answer will have 3 significant figures because the least number of significant figures in the two numbers used in the calculation was 3.
    Bloom's Taxonomy: 3 Difficulty: moderate

94. _____ is a substance composed of atoms of two or more elements chemically united in fixed proportions.
    Ans: Compound
    Bloom's Taxonomy: 1 Difficulty: easy

95. _____ is a substance that cannot be separated into simpler substances by chemical means.
    Ans: Element
    Bloom's Taxonomy: 1 Difficulty: easy

96. _____ is a combination of two or more substances in which the substances retain their distinct identities.
    Ans: Mixture
    Bloom's Taxonomy: 1 Difficulty: easy

97. _____ is something that has a definite composition.
    Ans: Pure substance
    Bloom's Taxonomy: 1 Difficulty: easy

98. _____, _____, and _____ are the three states of matter.
    Ans: Liquid, solid, and gas
    Bloom's Taxonomy: 1 Difficulty: easy

99. _____ has a uniform composition throughout.
    Ans: Homogeneous mixture
    Bloom's Taxonomy: 1 Difficulty: easy

100. _____ does not have a uniform composition throughout.
    Ans: Heterogeneous mixture
    Bloom's Taxonomy: 1 Difficulty: easy

101. Melting ice is a _____ change.
Ans: physical
Bloom's Taxonomy: 1 Difficulty: moderate

102. Burning wood in a fireplace is a _____ change.
Ans: chemical
Bloom's Taxonomy: 2 Difficulty: moderate

103. _____ tells how closely multiple measurements of the same thing are to one another.
Ans: Precision
Bloom's Taxonomy: 1 Difficulty: easy

104. _____ is the term used to indicate a measurement is accurate. (Hint: Often used when measuring the volume of a liquid.)
Ans: Graduated or Calibrated
Bloom's Taxonomy: 2 Difficulty: moderate

105. _____ tells how close a measurement is to the true value.
Ans: Accuracy
Bloom's Taxonomy: 1 Difficulty: easy

106. Briefly explain the relationship between hypothesis and experiment in the scientific method.
Ans: A hypothesis should be capable of leading to a prediction which is testable by experiment. If the experimental result differs from the prediction, the hypothesis should be modified.
Bloom's Taxonomy: 4 Difficulty: moderate

107. Explain the difference between a hypothesis and a theory.
Ans: A hypothesis is a tentative explanation for observations made and a theory is a unifying principle that explains a body of experimental observations and the laws that are based on them.
Bloom's Taxonomy: 4 Difficulty: moderate

108. Explain the difference between quantitative measurements and qualitative measurements.
Ans: A quantitative measurement is expressed with a number and a qualitative measurement does not require an explicit measurement.
Bloom's Taxonomy: 4 Difficulty: moderate

109. Explain the difference between a heterogeneous mixture and a homogeneous mixture.
Ans: A homogeneous mixture has a uniform composition throughout and a heterogeneous mixture does not have a uniform composition throughout.
Bloom's Taxonomy: 1 Difficulty: moderate

110. Discuss the benefits of using the metric system for measurements.
Ans: All measurements in the metric system are a multiple of 10 therefore is makes it easy to simply move the decimal point.
Bloom's Taxonomy: 5 Difficulty: difficult

111. Discuss the difference between the Celsius and Fahrenheit scale for measuring temperatures.
Ans: $0^{\circ}C = 32^{\circ}F$ and $100^{\circ}C = 212^{\circ}F$. To convert from $^{\circ}F$ to $^{\circ}C$ use the equation $^{\circ}C = (^{\circ}F - 32^{\circ}F) \times 5^{\circ}C/9^{\circ}F$ and to convert from $^{\circ}C$ to $^{\circ}F$ use the equation $^{\circ}F = [9^{\circ}F/5^{\circ}C](^{\circ}C) + 32^{\circ}F$
Bloom's Taxonomy: 4 Difficulty: moderate

112. Explain the difference between a physical property and a chemical property.
Ans: A physical property can be observed and measured without changing the identity of the substance and a chemical property requires a chemical change from one substance to another substance.
Bloom's Taxonomy: 1 Difficulty: easy

113. Explain the difference between an extensive property and an intensive property.
Ans: An extensive property depends on the amount of matter and an intensive property does not depend on the amount of matter.
Bloom's Taxonomy: 1 Difficulty: easy

114. Explain the rule for significant figures for addition and subtraction.
Ans: The answer cannot have more digits to the right of the decimal point than any of the original numbers used in the calculation.
Bloom's Taxonomy: 1 Difficulty: moderate

115. Explain the rule for significant figures for multiplication and division.
Ans: The number of significant figures in the final product or quotient is determined by the original number that has the smallest number of significant figures.
Bloom's Taxonomy: 1 Difficulty: moderate

116. Explain the difference between accuracy and precision.
Ans: Accuracy is how a measurement is to the true value and precision is how close multiple measurements of the same thing are to one another.
Bloom's Taxonomy: 1 Difficulty: moderate