***Chemistry, 5e* (Burdge)**

**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

Answer: C

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Scientific Method

Gradable: automatic

Accessibility: Keyboard Navigation

2) Which of the following is a tentative explanation for a set of observations?

A) Law

B) Hypothesis

C) Theory

D) Phenomena

E) Prediction

Answer: B

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Scientific Method

Gradable: automatic

Accessibility: Keyboard Navigation

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

Answer: A

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Scientific Method

Gradable: automatic

Accessibility: Keyboard Navigation

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

Answer: E

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Scientific Method

Gradable: automatic

Accessibility: Keyboard Navigation

5) Which of the following is a 'substance' according to the definition given in your textbook?

A) Air

B) Tap water

C) Sea water

D) Water

E) Toothpaste

Answer: D

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

6) Which of the following cannot be separated into simpler substances by chemical means?

A) Element

B) Emulsion

C) Compound

D) Homogeneous mixture

E) Heterogeneous mixture

Answer: A

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

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

Answer: C

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

8) Which of the following does not have a uniform composition throughout?

A) Element

B) Compound

C) Homogeneous mixture

D) Heterogeneous mixture

E) Solvent

Answer: D

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

9) Which of the following is not an SI base unit?

A) Meter

B) Ampere

C) Second

D) Gram

E) Kelvin

Answer: D

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Measurement (SI Units)

Gradable: automatic

Accessibility: Keyboard Navigation

10) The SI base unit of mass is

A) mg.

B) g.

C) kg.

D) metric ton.

E) lb.

Answer: C

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 1. Remember

Subtopic: Measurement (SI Units)

Gradable: automatic

Accessibility: Keyboard Navigation

11) The SI prefix *mega*- (M) means

A) 10–6.

B) 10–3.

C) 103.

D) 106.

E) 109.

Answer: D

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 1. Remember

Subtopic: Measurement (SI Units)

Gradable: automatic

Accessibility: Keyboard Navigation

12) The SI prefixes *milli*- and *mega*- represent, respectively:

A) 106 and 10–6

B) 10–3 and 106

C) 103 and 10–6

D) 10–3 and 109

E) 10–6 and 10–3

Answer: B

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 1. Remember

Subtopic: Measurement (SI Units)

Gradable: automatic

Accessibility: Keyboard Navigation

13) How many micrograms are in 65.3 kg?

A) 0.653 μg

B) 6.53 × 107 μg

C) 6.53 × 104 μg

D) 6.53 × 10–8 μg

E) 6.53 × 1010 μg

Answer: E

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

14) A dose of medication was prescribed to be 35 microliters. Which of the following expresses that volume in centiliters?

A) 3.5 × 105 cL

B) 3.5 × 104 cL

C) 3.5 cL

D) 3.5 × 10–4 cL

E) 3.5 × 10–3 cL

Answer: E

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

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

Answer: B

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

16) How many hertz is 600.11 MHz?

A) 6.0011 × 10–4 Hz

B) 60.011 Hz

C) 6.0011 × 106 Hz

D) 6.0011 × 10–2 Hz

E) 6.0011 × 108 Hz

Answer: E

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

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

Answer: C

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

18) Which of these quantities represents the largest mass?

A) 2.0 × 102 mg

B) 0.0010 kg

C) 1.0 × 105 μg

D) 2.0 × 102 cg

E) 10.0 dg

Answer: D

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

19) The mass of a sample is 550 milligrams. Which of the following expresses that mass in kilograms?

A) 5.5 × 108 kg

B) 5.5 × 105 kg

C) 5.5 × 10–4 kg

D) 5.5 × 10–6 kg

E) 5.5 × 10–1 kg

Answer: C

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

20) 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 × 105 km

B) 5.3 × 105 km

C) 3.9 × 105 km

D) 1.5 × 105 km

E) 9.4 × 104 km

Answer: C

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

21) 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

Answer: A

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

22) How many cubic inches are in 1.00 liter? (1 in = 2.54 cm)

A) 61.0 in3

B) 155 in3

C) 394 in3

D) 1.64 × 104 in3

E) none of them

Answer: A

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

23) 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

Answer: A

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

24) Given that 1 inch = 2.54 cm, 1.00 cm3 is equal to

A) 16.4 in3.

B) 6.45 in3.

C) 0.394 in3.

D) 0.155 in3.

E) 0.0610 in3.

Answer: E

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

25) 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

Answer: A

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

26) The average distance between the Earth and the Moon is 240,000 miles. Express this distance in meters. (1 mi = 1609 m)

A) 6.1 × 105 m

B) 5.3 × 105 m

C) 3.9 × 108 m

D) 1.5 × 105 m

E) 9.4 × 104 m

Answer: C

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

27) What is the volume in milliliters of a 32.0 fl 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

Answer: B

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

28) How many mm3 are in 16.7 cm3?

A) 1.67 × 10–5 mm3

B) 1.67 × 10–8 mm3

C) 1.67 × 107 mm3

D) 1.67 × 104 mm3

E) 1.67 × 10–4 mm3

Answer: D

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

29) If a patient in the hospital is running a temperature of 39.5°C, what is this in degrees Fahrenheit?

A) 99°F

B) 101.3°F

C) 102.4°F

D) 103.1°F

E) 104°F

Answer: D

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

30) If normal body temperature is 98.6°F then what is this in degrees Celsius?

A) 34°C

B) 35.5°C

C) 36.4°C

D) 37.0°C

E) 38.7°C

Answer: D

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

31) Express 122.0°F in °C.

A) 50.0°C

B) 64.4°C

C) 67.8°C

D) 162.0°C

E) 219.6°C

Answer: A

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

32) The boiling point for liquid helium is 4.0 K. What is the temperature in degrees Fahrenheit?

A) –452.5°F

B) –498.9°F

C) –237.2°F

D) 131.8°F

E) 530.9°F

Answer: A

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

33) If the temperature is 38.0°F then what is the temperature in kelvins?

A) 3.33 K

B) 100.4 K

C) 276.5 K

D) 311.15 K

E) 235.15 K

Answer: C

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

34) 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 them is within 2°F of the right answer.

Answer: C

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

35) The boiling point for liquid nitrogen is 77 K. What is the temperature in degrees Fahrenheit?

A) –127°F

B) –289°F

C) –321°F

D) 177°F

E) 662°F

Answer: C

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

36) 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

Answer: B

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

37) Isopropyl alcohol, commonly known as rubbing alcohol, boils at 82.4°C. What is the boiling point in kelvins?

A) 387.6 K

B) 355.6 K

C) 323.6 K

D) 190.8 K

E) –190.8 K

Answer: B

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

38) 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

Answer: D

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

39) What is the volume of a container that contains 14.3 g of a substance having a density of 0.988 g/cm3?

A) 14.1 cm3

B) 0.0691 cm3

C) 14.5 cm3

D) 141 cm3

E) 691 cm3

Answer: C

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

40) If you have a graduated cylinder containing 15.5 mL of water and this volume increases to 95.2 mL after a piece of metal with a mass of 7.95 g is dropped into the graduated cylinder, then what is the density of the 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

Answer: E

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

41) The density of mercury, the only metal to exist as a liquid at room temperature, is 13.6 g/cm3. What is that density in pounds per cubic inch? (1 in = 2.54 cm; 1 lb = 454 g)

A) 849 lb/in3

B) 491 lb/in3

C) 376 lb/in3

D) 0.491 lb/in3

E) 1.83 × 10–3 lb/in3

Answer: D

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

42) Radio waves travel at the speed of light, which is 3.00 × 108 m/s. How many minutes does it take for a radio message to reach Earth from Saturn if Saturn is 7.9 × 108 km from Earth?

A) 4.4 × 10–2 min

B) 1.6 × 105 min

C) 4.0 × 1015 min

D) 44 min

E) 2.6 min

Answer: D

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

43) The speed needed to escape the pull of Earth's gravity is 11.3 km/s. What is this speed in mi/h? (1 mile = 1609 m)

A) 65,500 mi/h

B) 25,300 mi/h

C) 18,200 mi/h

D) 1,090 mi/h

E) 5.02 × 10–3 mi/h

Answer: B

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

44) Radio waves travel at the speed of light, which is 3.00 × 108 m/s. How many kilometers will a radio message to outer space travel in exactly one year? (365.24 days = 1 y)

A) 9.46 × 1015 km

B) 7.30 × 108 km

C) 7.10 × 1010 km

D) 9.47 × 1012 km

E) 3.33 × 10– 3 km

Answer: D

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

45) The diameter of Earth is 12.7 Mm. Express this diameter in centimeters.

A) 1.27 × 105 cm

B) 1.27 × 106 cm

C) 1.27 × 107 cm

D) 1.27 × 108 cm

E) 1.27 × 109 cm

Answer: E

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

46) 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 × 105 cm/h

C) 4.1 × 109 cm/h

D) 1.1 × 106 cm/h

E) 1.6 × 109 cm/h

Answer: C

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

47) The city of Los Angeles is now approximately 2400 miles south of Anchorage, Alaska. It is moving slowly northward as the San Andreas fault slides along. If Los Angeles is to arrive near Anchorage 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.

Answer: C

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

48) Which of the following speeds is the greatest? (1 mi = 1609 m)

A) 40 mi/h

B) 2.0 × 105 mm/min

C) 40 km/h

D) 0.74 km/min

E) 400 m/min

Answer: A

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 5. Evaluate

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

49) Iron has a density of 7.87 g/cm3. What mass of iron would be required to cover a football playing surface of 120 yds × 60. yds to a depth of 1.0 mm? (1 inch = 2.54 cm)

A) 76 kg

B) 47 Mg

C) 7.6 × 105 g

D) 4.7 × 108 g

E) 1.9 × 107 g

Answer: B

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

50) The recommended daily allowance (RDA) of calcium is 1.2 g. Calcium carbonate contains 12.0% calcium by mass. How many grams of calcium carbonate are needed to provide the RDA of calcium?

A) 0.10 g

B) 0.14 g

C) 1.2 g

D) 10. g

E) 14 g

Answer: D

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

51) One of the common intravenous fluids, called physiological saline, is a homogeneous mixture of NaCl in water. In this mixture, 0.89% of the mass is contributed by the NaCl. What mass of NaCl is found in 450. mL of physiological saline? ((Density of physiological saline = 1.005 g/cm3)

A) 2.0 g

B) 4.0 g

C) 5.1 g

D) 508 g

E) 400 g

Answer: B

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

52) The mask of an empty flask is 17.4916 g, and its mass when filled with water at 20.0°C (density = 0.9982 g/mL) is 43.9616 g.  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

Answer: B

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

53) 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, H2SO4, its mass is 1026.57 g. What is the density of concentrated sulfuric acid? (Assume water has a density of 1.00 g/cm3 at the temperature of the measurement.)

A) 1.992 g/cm3

B) 1.840 g/cm3

C) 1.729 g/cm3

D) 1.598 g/cm3

E) 0.543 g/cm3

Answer: B

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

54) Talc is a mineral with low conductivity for heat and electricity which is not attacked by acid. It is used in talcum powder and face powder. Suppose a sample of talc weighs 13.65 g with a density of 1.75 g/cm3 in mineral oil. If this same sample of talc in air weighs 35.97 g, assuming no volume change, what is the density of the talc sample in air?

A) 4.61 g/cm3

B) 2.82 g/cm3

C) 2.63 g/cm3

D) 2.44 g/cm3

E) 1.61 g/cm3

Answer: A

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

55) Which of the following is an example of an *observation*?

A) Gases expand as their temperature increases because the gas molecules are moving more rapidly.

B) Paraffin wax begins to melt at 57°C.

C) Three samples of wax are heated to 75°C.

D) The force acting on an object is equal to its mass times its acceleration.

E) Will all waxes melt at the same temperature?

Answer: B

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Scientific Method; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

56) 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

Answer: C

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

57) 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.

Answer: E

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

58) 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.

Answer: A

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

59) 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

Answer: B

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

60) 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

Answer: E

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

61) 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

Answer: B

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

62) Which of the following is an *extensive* property?

A) Density

B) Temperature

C) Mass

D) Specific Heat

E) Pressure

Answer: C

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

63) The number 1.050 × 109 has how many significant figures?

A) 2

B) 3

C) 4

D) 9

E) 13

Answer: C

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

64) After carrying out the operation (13.7 + 0.027) ÷ 8.221, how many significant figures are appropriate to show in the result?

A) 1

B) 2

C) 3

D) 4

E) 5

Answer: C

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

65) How many significant figures are in 0.006570?

A) 3

B) 4

C) 5

D) 6

E) 7

Answer: B

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

66) 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.

Answer: A

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

67) 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

Answer: E

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

68) How many significant figures does the sum 8.5201 + 1.93 contain?

A) 1

B) 2

C) 3

D) 4

E) 5

Answer: D

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

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

|  |
| --- |
|  13.602 x 1.90 x 3.06 --------------------------------     4.2 x 1.4097  |

A) 13.3568

B) 13.357

C) 13.36

D) 13.4

E) 13

Answer: E

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

70) Which of the following properly expresses 0.01234 in scientific notation?

A) 1.234 × 10–3

B) 12.3 × 104

C) 1 × 10–1

D) 1.234 × 102

E) 1.234 × 10–2

Answer: E

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

71) 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 = 1.0567 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.

Answer: D

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 5. Evaluate

Subtopic: Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

72) Which of the following correctly expresses 52.068881 in scientific notation, rounded to three significant figures?

A) 5.21 × 10–1

B) 5.20 × 10–1

C) 5.21 × 101

D) 5.20 × 101

E) 5.21 × 102

Answer: C

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

73) Which choice correctly expresses 15,390,000 rounded to two significant figures?

A) 15

B) 1.5 × 10–7

C) 1.5 × 108

D) 15,400,000

E) 15,000,000

Answer: E

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

74) What is the length of the box, using the proper number of significant figures and units?

A) 5.5 cm

B) 5 cm

C) 6 cm

D) 5.67 cm

E) 5.6 cm

Answer: D

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures

Gradable: automatic

75) The dark meat of a 20-pound turkey requires an internal temperature of 180°F to be fully cooked. What minimum temperature reading should be displayed on a food thermometer that only measures in degrees Celsius?

A) 82°C

B) 354°C

C) 261°C

D) –192°C

E) –310°C

Answer: A

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

76) 50.0 grams of acetic acid are required for an experiment. What volume, in milliliters, of a 1.105 g/cm3 acetic acid solution must be measured for the experiment?

A) 0.0452 mL

B) 45.2 mL

C) 55.3 mL

D) 0.452 mL

E) 4.52 mL

Answer: B

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

77) A geology student found an irregularly shaped rock, with a mass of 28.63 grams, and placed it into a graduated cylinder containing 13.31 mL of water. If the water level increased to 19.73 mL after the rock was placed in the cylinder, what is the density of the rock, in g/mL?

A) 4.46 g/mL

B) 4460 g/mL

C) 2.20 g/mL

D) 0.455 g/mL

E) 44.6 g/mL

Answer: A

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

78) An average Mastiff puppy weighs 2.72 kilograms. How many pounds does an average Mastiff puppy weigh? (1 lb = 453.6 g)

A) 1.24 lb

B) 10.0 lb

C) 59.8 lb

D) 6.00 lb

E) 72.0 lb

Answer: D

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

79) If the density of corn syrup is 1.380 g/mL and a sample of corn syrup has a mass of 32 grams, what is the volume of corn syrup, in liters?

A) 43 L

B) 23 L

C) 0.043 L

D) 0.023 L

E) 2.3 L

Answer: D

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

80) A smart phone has dimensions of 4.9 inches (height), 2.3 inches (width) and 8.0 millimeters (depth). What is the volume of the smart phone in cubic centimeters? (1 in = 2.54 cm)

A) 58 cm3

B) 1.7 x 105 cm3

C) 90 cm3

D) 3.4 cm3

E) 34 cm3

Answer: A

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Scientific Notation and Significant Figures; Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

81) There are 58 counties in California and about 660,000 people in each county. How many million people live in California?

A) 383 million people

B) 38 million people

C) 40 million people

D) 58 million people

E) 11 million people

Answer: B

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

82) Which of the following represents the greatest mass?

A) 2.0 x 103 mg

B) 10.0 dg

C) 0.0010 kg

D) 1.0 x 106 µg

E) 3.0 x 1012 pg

Answer: E

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 5. Evaluate

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

83) Walking fast can consume 5.0 kcal per minute. How many hours of exercise are required to consume 450 kcal, the energy in a large candy bar?

A) 7.5 hr

B) 1.25 hr

C) 1.75 hr

D) 1.5 hr

E) 1 hr

Answer: D

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

84) A laboratory technician analyzed a sample three times for percent iron and got the following results: 22.43% Fe, 24.98% Fe, and 21.02% Fe. The actual percent iron in the sample was 22.81%. The analyst's

A) precision was poor but the average result was accurate.

B) accuracy was poor but the precision was good.

C) work was only qualitative.

D) work was precise.

Answer: A

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Measurement (SI Units)

Gradable: automatic

Accessibility: Keyboard Navigation

85) The density of magnesium is 1.7 g/cm3, and the density of iron is 7.9 g/cm3. Consider a block of iron with a mass of 819 g. What is the mass of a block of magnesium that has the same volume as the block of iron?

A) 1.8 x 102 g

B) 61 g

C) 2.8 x 103 g

D) 3.8 x 103 g

E) None of these choices.

Answer: A

Difficulty: 3 Hard

Topic: Study of Chemistry

Bloom's: 5. Evaluate

Subtopic: Measurement (SI Units)

Gradable: automatic

Accessibility: Keyboard Navigation

86) The ripening of fruit, once picked, is an example of physical change.

Answer: FALSE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

87) When applying the scientific method, it is important to avoid any form of hypothesis.

Answer: FALSE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Method

Gradable: automatic

Accessibility: Keyboard Navigation

88) When applying the scientific method, a model or theory should be based on experimental data.

Answer: TRUE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Method

Gradable: automatic

Accessibility: Keyboard Navigation

89) Matter is anything that has mass and occupies space.

Answer: TRUE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

90) The density of a substance is an intensive property.

Answer: TRUE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

91) The volume of a substance is an intensive property.

Answer: FALSE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

92) Boiling point and melting point are extensive properties.

Answer: FALSE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

93) The rusting of a piece of iron under environmental conditions is a physical change.

Answer: FALSE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

94) The number 6.0448, rounded to 3 decimal places, becomes 6.045.

Answer: TRUE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Scientific Notation and Significant Figures

Gradable: automatic

Accessibility: Keyboard Navigation

95) A scoop of vanilla ice cream is a pure substance.

Answer: FALSE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

96) A particular temperature in degrees Celsius is larger than the temperature in kelvins.

Answer: FALSE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units); Dimensional Analysis

Gradable: automatic

Accessibility: Keyboard Navigation

97) Zero kelvin 0 K < 0°F < 0°C.

Answer: TRUE

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units)

Gradable: automatic

Accessibility: Keyboard Navigation

98) 77 K is colder than 4 K.

Answer: FALSE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Measurement (SI Units)

Gradable: automatic

Accessibility: Keyboard Navigation

99) The juice from an orange is a mixture.

Answer: TRUE

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

100) \_\_\_\_\_\_\_\_ tells how close a measurement is to the true value.

Answer: Accuracy

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Measurement (SI Units)

Gradable: automatic

101) Melting ice is a \_\_\_\_\_\_\_\_ change.

Answer: physical

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Properties of Matter

Gradable: automatic

102) Burning wood in a fireplace is a \_\_\_\_\_\_\_\_ change.

Answer: chemical

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Properties of Matter

Gradable: automatic

103) A(n) \_\_\_\_\_\_\_\_ is a substance composed of atoms of two or more elements chemically united in fixed proportions.

Answer: compound

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

104) A(n)\_\_\_\_\_\_\_\_ is a substance that cannot be separated into simpler substances by chemical means.

Answer: element

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

105) A(n)\_\_\_\_\_\_\_\_ is a combination of two or more substances in which the substances retain their distinct identities.

Answer: mixture

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

106) A(n) \_\_\_\_\_\_\_\_ is something that has a definite composition.

Answer: pure substance

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

107) Which of the following is not a state of matter?

A) gas

B) solid

C) mixture

D) liquid

Answer: C

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

108) A \_\_\_\_\_\_\_\_ mixture has a uniform composition throughout.

A) heterogeneous

B) homologous

C) homogeneous

D) heterologous

Answer: C

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

109) A \_\_\_\_\_\_\_\_ mixture does not have a uniform composition throughout.

A) heterogeneous

B) homologous

C) homogeneous

D) heterologous

Answer: A

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: automatic

Accessibility: Keyboard Navigation

110) \_\_\_\_\_\_\_\_ tells how closely multiple measurements of the same thing are to one another.

Answer: Precision

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Measurement (SI Units)

Gradable: automatic

111) \_\_\_\_\_\_\_\_ is the term used to indicate a measuring device is accurate. (Hint: Often used when measuring the volume of a liquid.)

Answer: Graduated or Calibrated

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Measurement (SI Units)

Gradable: automatic

112) What is something that has a definite composition?

Answer: pure substance

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: manual

113) What is a combination of two or more substances in which the substances retain their distinct identities?

Answer: mixture

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: manual

114) What is a substance that cannot be separated into simpler substances by chemical means?

Answer: element

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: manual

115) What is a substance composed of atoms of two or more elements chemically united in fixed proportions?

Answer: compound

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: manual

116) Give examples of three physical properties.

Answer: (Answers will vary.) Melting point, boiling point, density, color

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Properties of Matter

Gradable: manual

117) Give an example of an *extensive* property.

Answer: (Answers will vary.) Mass, length, and volume

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Properties of Matter

Gradable: manual

118) Give an example of an *intensive* property.

Answer: (Answers will vary.) Temperature, density, melting point, boiling point

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 3. Apply

Subtopic: Properties of Matter

Gradable: manual

119) Identify this process as a *physical* or *chemical* change: Bacteria convert milk to yogurt.

Answer: Chemical

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 4. Analyze

Subtopic: Properties of Matter

Gradable: manual

120) What is the equation for the conversion of Celsius temperatures to Kelvin temperatures?

Answer: °C + 273.15 = K

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Measurement (SI Units); Dimensional Analysis

Gradable: manual

121) If two numbers are added together, one which has 2 digits after the decimal point and the other which has 1 digit after the decimal point, explain how to round the answer.

Answer: 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.

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Scientific Notation and Significant Figures

Gradable: manual

122) If two numbers are multiplied together, one which has 3 significant figures and the other which has 4 significant figures, explain how to round the answer.

Answer: The answer will have 3 significant figures because the least number of significant figures in the two numbers used in the calculation was 3.

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Scientific Notation and Significant Figures

Gradable: manual

123) What is the equation used to calculate the mass from the density?

Answer: mass = density × volume or *m* = *dV*

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Dimensional Analysis

Gradable: manual

124) Briefly explain the relationship between hypothesis and experiment in the scientific method.

Answer: A hypothesis should be capable of leading to a prediction which is testable by an experiment. If the experimental result differs from the prediction, the hypothesis should be modified.

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Scientific Method

Gradable: manual

125) Explain the difference between quantitative measurements and qualitative measurements.

Answer: A quantitative measurement is expressed with a number, whereas a qualitative measurement does not require an explicit measurement.

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Scientific Method

Gradable: manual

126) Explain the difference between a physical property and a chemical property.

Answer: A physical property can be observed and measured without changing the identity of the substance, whereas a chemical property requires a chemical change from one substance to another substance.

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Properties of Matter

Gradable: manual

127) Explain the difference between an extensive property and an intensive property.

Answer: An extensive property depends on the amount of matter, whereas an intensive property does not depend on the amount of matter.

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Properties of Matter

Gradable: manual

128) Explain the rule for significant figures for addition and subtraction.

Answer: The answer cannot have more digits to the right of the decimal point than any of the original numbers used in the calculation.

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Scientific Notation and Significant Figures

Gradable: manual

129) Explain the rule for significant figures for multiplication and division.

Answer: 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.

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Scientific Notation and Significant Figures

Gradable: manual

130) Explain the difference between a heterogeneous mixture and a homogeneous mixture.

Answer: A homogeneous mixture has a uniform composition throughout, whereas a heterogeneous mixture does not have a uniform composition throughout.

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Classification and States of Matter; Properties of Matter

Gradable: manual

131) Discuss the benefits of using the metric system for measurements.

Answer: All measurements in the metric system are a multiple of 10, so it makes it easy to move the decimal point. Additionally, the use of the seven base units with prefixes to denote decimal fractions and decimal multiples of the SI units enables scientists to tailor the magnitude of a unit to a particular application.

Difficulty: 1 Easy

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Measurement (SI Units)

Gradable: manual

132) Explain the difference between a hypothesis and a theory.

Answer: A hypothesis is a tentative explanation for observations made, whereas a theory is a unifying principle that explains a body of experimental observations and the laws that are based on them.

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Scientific Method

Gradable: manual

133) Explain the difference between accuracy and precision.

Answer: Accuracy tells us how close a measurement is to the *true* value, whereas precision tells us how closely multiple measurements of the same thing are to one another.

Difficulty: 2 Medium

Topic: Study of Chemistry

Bloom's: 2. Understand

Subtopic: Measurement (SI Units)

Gradable: manual