

<https://sellidocx.com/products/test-bank-chemistry-4e-burdge> Chapter 01  
**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

*Blooms: 2. Understand  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Scientific Method  
Topic: Study of Chemistry*

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

- A. Law
- B. Hypothesis
- C. Theory
- D. Phenomena
- E. Prediction

*Blooms: 2. Understand  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Scientific Method  
Topic: Study of Chemistry*

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

*Blooms: 2. Understand  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Scientific Method  
Topic: Study of Chemistry*

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

*Blooms: 2. Understand  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Scientific Method  
Topic: Study of Chemistry*

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

*Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

Blooms: 4. Analyze  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry

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

Blooms: 4. Analyze  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry

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

- A. Element
- B. Compound
- C. Homogeneous mixture
- D. Heterogeneous mixture
- E. Solvent

Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry

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

- A. Meter
- B. Ampere
- C. Second
- D. Gram
- E. Kelvin

Blooms: 2. Understand  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Measurement (SI Units)  
Topic: Study of Chemistry

10. The SI base unit of mass is

- A. mg.
- B. g.
- C. kg.
- D. metric ton.
- E. lb.

Blooms: 1. Remember  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Measurement (SI Units)  
Topic: Study of Chemistry

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

- A.  $10^{-6}$
- B.  $10^{-3}$
- C.  $10^3$
- D.  $10^6$**
- E.  $10^9$

*Blooms: 1. Remember*  
*Difficulty: Easy*  
*Gradable: automatic*  
*Subtopic: Measurement (SI Units)*  
*Topic: Study of Chemistry*

12. The SI 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  $10^{-3}$

*Blooms: 1. Remember*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Measurement (SI Units)*  
*Topic: Study of Chemistry*

13. How many micrograms are in 65.3 kg?

- A. 0.653  $\mu\text{g}$
- B.  $6.53 \times 10^7 \mu\text{g}$
- C.  $6.53 \times 10^4 \mu\text{g}$
- D.  $6.53 \times 10^{-8} \mu\text{g}$
- E.  $6.53 \times 10^{10} \mu\text{g}$**

*Blooms: 3. Apply*  
*Difficulty: Hard*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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

- A.  $3.5 \times 10^5 \text{ cL}$
- B.  $3.5 \times 10^4 \text{ cL}$
- C. 3.5 cL
- D.  $3.5 \times 10^{-4} \text{ cL}$
- E.  $3.5 \times 10^{-3} \text{ cL}$**

*Blooms: 3. Apply*  
*Difficulty: Hard*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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

*Blooms: 3. Apply*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

16. How many hertz is 600.11 MHz?

- A.  $6.0011 \times 10^{-4}$  Hz
- B. 60.011 Hz
- C.  $6.0011 \times 10^6$  Hz
- D.  $6.0011 \times 10^{-2}$  Hz
- E.  $6.0011 \times 10^8$  Hz

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

17. The distance between carbon atoms in ethylene is 134 picometers. Which of the following expresses that distance in meters?

- A.  $1.34 \times 10^{-13}$  m
- B.  $1.34 \times 10^{-12}$  m
- C.  $1.34 \times 10^{-10}$  m
- D.  $1.34 \times 10^{-7}$  m
- E.  $1.34 \times 10^{-6}$  m

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

18. Which of these quantities represents the largest mass?

- A.  $2.0 \times 10^2$  mg
- B. 0.0010 kg
- C.  $1.0 \times 10^5$   $\mu$ g
- D.  $2.0 \times 10^2$  cg
- E. 10.0 dg

Blooms: 4. Analyze  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Topic: Study of Chemistry

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

- A.  $5.5 \times 10^8$  kg
- B.  $5.5 \times 10^5$  kg
- C.  $5.5 \times 10^{-4}$  kg
- D.  $5.5 \times 10^{-6}$  kg
- E.  $5.5 \times 10^{-1}$  kg

Blooms: 3. Apply  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

- A.  $6.1 \times 10^5$  km
- B.  $5.3 \times 10^5$  km
- C.  $3.9 \times 10^5$  km
- D.  $1.5 \times 10^5$  km
- E.  $9.4 \times 10^4$  km

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

21. How many inches are in 382.5 cm? (1 in = 2.54 cm)?

- A. 150.6 in
- B.  $6.641 \times 10^{-3}$  in
- C. 151 in
- D. 971.6 in
- E. 972 in

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

- A. 61.0 in<sup>3</sup>
- B. 155 in<sup>3</sup>
- C. 394 in<sup>3</sup>
- D.  $1.64 \times 10^4$  in<sup>3</sup>
- E. none of them

Blooms: 3. Apply  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

23. How many inches are in 382.5 cm? (1 in = 2.54 cm)

- A. 150.6 in
- B.  $6.641 \times 10^{-3}$  in
- C. 151 in
- D. 971.6 in
- E. 972 in

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

24. Given that 1 inch = 2.54 cm, 1.00 cm<sup>3</sup> is equal to

- A. 16.4 in<sup>3</sup>
- B. 6.45 in<sup>3</sup>
- C. 0.394 in<sup>3</sup>
- D. 0.155 in<sup>3</sup>
- E. 0.0610 in<sup>3</sup>

Blooms: 3. Apply  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

26. The average distance between the Earth and the Moon is 240,000 miles. Express this distance in meters. (1 mi = 1609 m)
- A.  $6.1 \times 10^5$  m
  - B.  $5.3 \times 10^5$  m
  - C.**  $3.9 \times 10^8$  m
  - D.  $1.5 \times 10^5$  m
  - E.  $9.4 \times 10^4$  m

*Blooms: 3. Apply*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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

*Blooms: 3. Apply*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

28. How many  $\text{mm}^3$  are in  $16.7 \text{ cm}^3$ ?
- A.  $1.67 \times 10^{-5} \text{ mm}^3$
  - B.  $1.67 \times 10^{-8} \text{ mm}^3$
  - C.  $1.67 \times 10^7 \text{ mm}^3$
  - D.**  $1.67 \times 10^4 \text{ mm}^3$
  - E.  $1.67 \times 10^{-4} \text{ mm}^3$

*Blooms: 3. Apply*  
*Difficulty: Hard*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

29. If a patient in the hospital is running a temperature of  $39.5^\circ\text{C}$ , what is this in degrees Fahrenheit?
- A.  $99^\circ\text{F}$
  - B.  $101.3^\circ\text{F}$
  - C.  $102.4^\circ\text{F}$
  - D.**  $103.1^\circ\text{F}$
  - E.  $104^\circ\text{F}$

*Blooms: 3. Apply*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

30. If normal body temperature is  $98.6^\circ\text{F}$  then what is this in degrees Celsius?
- A.  $34^\circ\text{C}$
  - B.  $35.5^\circ\text{C}$
  - C.  $36.4^\circ\text{C}$
  - D.**  $37.0^\circ\text{C}$
  - E.  $38.7^\circ\text{C}$

*Blooms: 3. Apply*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

Blooms: 3. Apply  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

Blooms: 3. Apply  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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.

Blooms: 3. Apply  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

Blooms: 3. Apply  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

*Blooms: 3. Apply*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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

*Blooms: 3. Apply*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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

*Blooms: 3. Apply*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

39. What is the volume of a container that contains 14.3 g of a substance having a density of 0.988 g/cm<sup>3</sup>?

- A. 14.1 cm<sup>3</sup>
- B. 0.0691 cm<sup>3</sup>
- C. 14.5 cm<sup>3</sup>**
- D. 141 cm<sup>3</sup>
- E. 691 cm<sup>3</sup>

*Blooms: 4. Analyze*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

40. 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 graduated cylinder, then 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.  $9.97 \times 10^{-2}$  g/mL**

*Blooms: 4. Analyze*  
*Difficulty: Hard*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

41. The density of mercury, the only metal to exist as a liquid at room temperature, is 13.6 g/cm<sup>3</sup>. What is that density in pounds per cubic inch? (1 in = 2.54 cm; 1 lb = 454 g)

- A. 849 lb/in<sup>3</sup>
- B. 491 lb/in<sup>3</sup>
- C. 376 lb/in<sup>3</sup>
- D. 0.491 lb/in<sup>3</sup>**
- E.  $1.83 \times 10^{-3}$  lb/in<sup>3</sup>

*Blooms: 4. Analyze*  
*Difficulty: Hard*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

42. Radio waves travel at the speed of light, which is  $3.00 \times 10^8$  m/s. How many minutes does it take for a radio message to reach Earth from Saturn if Saturn is  $7.9 \times 10^8$  km from Earth?

- A.  $4.4 \times 10^{-2}$  min
- B.  $1.6 \times 10^5$  min
- C.  $4.0 \times 10^{15}$  min
- D. 44 min**
- E. 2.6 min

*Blooms: 4. Analyze*  
*Difficulty: Hard*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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.  $5.02 \times 10^{-3}$  mi/h

*Blooms: 4. Analyze*  
*Difficulty: Hard*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

44. Radio waves travel at the speed of light, which is  $3.00 \times 10^8$  m/s. How many kilometers will radio messages to outer space travel in exactly one year? (365.24 days = 1 y)

- A.  $9.46 \times 10^{15}$  km
- B.  $7.30 \times 10^8$  km
- C.  $7.10 \times 10^{10}$  km
- D.  $9.47 \times 10^{12}$  km**
- E.  $3.33 \times 10^{-3}$  km

*Blooms: 4. Analyze*  
*Difficulty: Hard*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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

- A.  $1.27 \times 10^5$  cm
- B.  $1.27 \times 10^6$  cm
- C.  $1.27 \times 10^7$  cm
- D.  $1.27 \times 10^8$  cm
- E.  $1.27 \times 10^9$  cm

Blooms: 4. Analyze  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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.  $4.1 \times 10^5$  cm/h
- C.  $4.1 \times 10^9$  cm/h
- D.  $1.1 \times 10^6$  cm/h
- E.  $1.6 \times 10^9$  cm/h

Blooms: 4. Analyze  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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.  $2.0 \times 10^{-10}$  mm/mo.
- B.  $6.6 \times 10^{-6}$  mm/mo.
- C. 4.2 mm/mo.
- D. 9.5 mm/mo.
- E. 51 mm/mo.

Blooms: 4. Analyze  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

- A. 40 mi/h
- B.  $2.0 \times 10^5$  mm/min
- C. 40 km/h
- D. 0.74 km/min
- E. 400 m/min

Blooms: 5. Evaluate  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

49. Iron has a density of  $7.87 \text{ g/cm}^3$ . What mass of iron would be required to cover a football playing surface of  $120 \text{ yds} \times 60. \text{ yds}$  to a depth of  $1.0 \text{ mm}$ ? ( $1 \text{ inch} = 2.54 \text{ cm}$ )

- A.  $76 \text{ kg}$
- B.  $47 \text{ Mg}$**
- C.  $7.6 \times 10^5 \text{ g}$
- D.  $4.7 \times 10^8 \text{ g}$
- E.  $1.9 \times 10^7 \text{ g}$

Blooms: 4. Analyze  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

- A.  $0.10 \text{ g}$
- B.  $0.14 \text{ g}$
- C.  $1.2 \text{ g}$
- D.  $10. \text{ g}$**
- E.  $14 \text{ g}$

Blooms: 4. Analyze  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

51. One of the common intravenous fluids, called physiological saline, is a homogeneous mixture of  $\text{NaCl}$  in water. In this mixture,  $0.89\%$  of the mass is contributed by the  $\text{NaCl}$ . What mass of  $\text{NaCl}$  is found in  $450. \text{ mL}$  of physiological saline? ((Density of physiological saline =  $1.005 \text{ g/cm}^3$ )

- A.  $2.0 \text{ g}$
- B.  $4.0 \text{ g}$**
- C.  $5.1 \text{ g}$
- D.  $508 \text{ g}$
- E.  $400 \text{ g}$

Blooms: 4. Analyze  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

52. An empty flask's mass is  $17.4916 \text{ g}$ , and its mass is  $43.9616 \text{ g}$  when filled with water at  $20.0^\circ\text{C}$  (density =  $0.9982 \text{ g/mL}$ ). The density of "heavy water" at  $20.0^\circ\text{C}$  is  $1.1053 \text{ g/mL}$ . What is the mass of the flask when filled with heavy water at  $20.0^\circ\text{C}$ ?

- A.  $29.2573 \text{ g}$
- B.  $46.8016 \text{ g}$**
- C.  $46.7489 \text{ g}$
- D.  $29.3100 \text{ g}$
- E.  $43.9140 \text{ g}$

Blooms: 4. Analyze  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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,  $\text{H}_2\text{SO}_4$ , its mass is 1026.57 g. What is the density of concentrated sulfuric acid? (Assume water has a density of  $1.00 \text{ g/cm}^3$  at the temperature of the measurement.)

- A.  $1.992 \text{ g/cm}^3$
- B.  $1.840 \text{ g/cm}^3$**
- C.  $1.729 \text{ g/cm}^3$
- D.  $1.598 \text{ g/cm}^3$
- E.  $0.543 \text{ g/cm}^3$

Blooms: 4. Analyze  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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  $1.75 \text{ g/cm}^3$  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.  $4.61 \text{ g/cm}^3$**
- B.  $2.82 \text{ g/cm}^3$
- C.  $2.63 \text{ g/cm}^3$
- D.  $2.44 \text{ g/cm}^3$
- E.  $1.61 \text{ g/cm}^3$

Blooms: 4. Analyze  
Difficulty: Hard  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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  $57^\circ\text{C}$ .**
- C. Three samples of wax are heated to  $75^\circ\text{C}$ .
- D. The force acting on an object is equal to its mass times its acceleration.
- E. Will all waxes melt at the same temperature?

Blooms: 2. Understand  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Properties of Matter  
Subtopic: Scientific Method  
Topic: Study of Chemistry

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

Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry

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  $601^\circ\text{C}$ .**

Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry

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.

Blooms: 3. Apply

Difficulty: Easy

Gradable: automatic

Subtopic: Classification and States of Matter

Subtopic: Properties of Matter

Topic: Study of Chemistry

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

Blooms: 3. Apply

Difficulty: Easy

Gradable: automatic

Subtopic: Classification and States of Matter

Subtopic: Properties of Matter

Topic: Study of Chemistry

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

Blooms: 3. Apply

Difficulty: Easy

Gradable: automatic

Subtopic: Classification and States of Matter

Subtopic: Properties of Matter

Topic: Study of Chemistry

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

Blooms: 3. Apply

Difficulty: Easy

Gradable: automatic

Subtopic: Classification and States of Matter

Subtopic: Properties of Matter

Topic: Study of Chemistry

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

- A. Density
- B. Temperature
- C. Mass
- D. Specific Heat
- E. Pressure

Blooms: 3. Apply

Difficulty: Easy

Gradable: automatic

Subtopic: Scientific Notation and Significant Figures

Topic: Study of Chemistry

63. The number  $1.050 \times 10^9$  has how many significant figures?

- A. 2
- B. 3
- C. 4
- D. 9
- E. 13

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

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

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

65. How many significant figures are in 0.006570?

- A. 3
- B. 4
- C. 5
- D. 6
- E. 7

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

66. The result of  $(3.8621 \times 1.5630) - 5.98$  is properly written as

- A. 0.06.
- B. 0.056.
- C. 0.0565.
- D. 0.05646.
- E. 0.056462.

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

67. Select the answer with the correct number of decimal places for the following sum:  $13.914 \text{ cm} + 243.1 \text{ cm} + 12.00460 \text{ cm} =$

- A. 269.01860 cm
- B. 269.0186 cm
- C. 269.019 cm
- D. 269.02 cm
- E. 269.0 cm

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

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

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

$$13.602 \times 1.90 \times 3.06$$

-----  
 $4.2 \times 1.4097$

- A. 13.3568
- B. 13.357
- C. 13.36
- D. 13.4
- E. 13

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

70. Which is correct if 0.01234 is rewritten in scientific notation?

- A.  $1.234 \times 10^{-3}$
- B.  $12.3 \times 10^4$
- C.  $1 \times 10^{-1}$
- D.  $1.234 \times 10^2$
- E.  $1.234 \times 10^{-2}$

Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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.

Blooms: 5. Evaluate  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Topic: Study of Chemistry

72. Which is correct if 52.068881 is rewritten in scientific notation and rounded to three significant figures?

- A.  $5.21 \times 10^{-1}$
- B.  $5.20 \times 10^{-1}$
- C.  $5.21 \times 10^1$
- D.  $5.20 \times 10^1$
- E.  $5.21 \times 10^2$

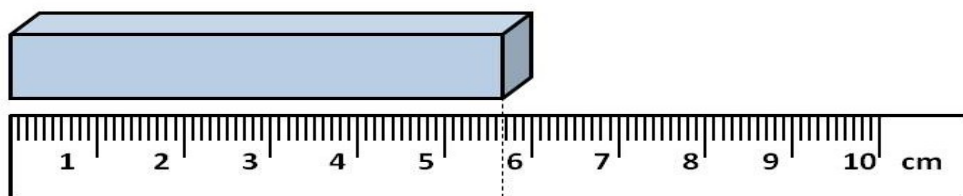
Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

73. Which is correct if 15,390,000 is rounded to two significant figures?

- A. 15
- B.  $1.5 \times 10^{-7}$
- C.  $1.5 \times 10^8$
- D. 15,400,000
- E. 15,000,000**

Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

Blooms: 4. Analyze  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

76. 50.0 grams of acetic acid are required for an experiment. What volume, in milliliters, of a 1.105 g/cm<sup>3</sup> 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

Blooms: 4. Analyze  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry

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

*Blooms: 4. Analyze*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

78. An average Mastiff puppy weighs 2.72 kilograms. How many pounds is an average Mastiff puppy?

(1lb = 453.6 g)

- A. 1.24 lb
- B. 10.0 lb
- C. 59.8 lb
- D. 6.00 lb
- E. 72.0 lb

*Blooms: 4. Analyze*  
*Difficulty: Easy*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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

*Blooms: 4. Analyze*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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 cm<sup>3</sup>
- B.  $1.7 \times 10^5$  cm<sup>3</sup>
- C. 90 cm<sup>3</sup>
- D. 3.4 cm<sup>3</sup>
- E. 34 cm<sup>3</sup>

*Blooms: 4. Analyze*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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

*Blooms: 3. Apply*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Topic: Study of Chemistry*

82. Which of the following represents the greatest mass?

- A.  $2.0 \times 10^3$  mg
- B. 10.0 dg
- C. 0.0010 kg
- D.  $1.0 \times 10^6$   $\mu$ g
- E.  $3.0 \times 10^{12}$  pg**

*Blooms: 5. Evaluate*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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

*Blooms: 3. Apply*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Dimensional Analysis*  
*Topic: Study of Chemistry*

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.

*Blooms: 2. Understand*  
*Difficulty: Medium*  
*Gradable: automatic*  
*Subtopic: Measurement (SI Units)*  
*Topic: Study of Chemistry*

85. The density of magnesium is  $1.7 \text{ g/cm}^3$ , and the density of iron is  $7.9 \text{ g/cm}^3$ . 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.  $1.8 \times 10^2$  g**
- B. 61 g
- C.  $2.8 \times 10^3$  g
- D.  $3.8 \times 10^3$  g
- E. None of the.

*Blooms: 5. Evaluate*  
*Difficulty: Difficult*  
*Gradable: automatic*  
*Subtopic: Measurement (SI Units)*  
*Topic: Study of Chemistry*

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

**FALSE**

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

**FALSE**

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Scientific Method  
Topic: Study of Chemistry*

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

**TRUE**

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Scientific Method  
Topic: Study of Chemistry*

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

**TRUE**

*Blooms: 4. Analyze  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

**TRUE**

*Blooms: 4. Analyze  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

**FALSE**

*Blooms: 4. Analyze  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

92. Boiling point and melting point are extensive properties.

**FALSE**

*Blooms: 4. Analyze  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

**FALSE**

*Blooms: 4. Analyze  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

**TRUE**

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry*

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

**FALSE**

*Blooms: 4. Analyze  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

**FALSE**

*Blooms: 4. Analyze  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Dimensional Analysis  
Subtopic: Measurement (SI Units)  
Topic: Study of Chemistry*

97. Zero kelvin  $0\text{ K} < 0^{\circ}\text{F} < 0^{\circ}\text{C}$ .

**TRUE**

*Blooms: 4. Analyze  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Measurement (SI Units)  
Topic: Study of Chemistry*

98. 77 K is colder than 4 K.

**FALSE**

*Blooms: 4. Analyze  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Measurement (SI Units)  
Topic: Study of Chemistry*

99. The juice from an orange is a mixture.

**TRUE**

*Blooms: 4. Analyze  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

**Accuracy**

*Blooms: 3. Apply  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Measurement (SI Units)  
Topic: Study of Chemistry*

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

**physical**

*Blooms: 4. Analyze  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

102. Burning wood in a fireplace is a \_\_\_\_\_ change.  
**chemical**

*Blooms: 4. Analyze  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

107. \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ are the three states of matter.  
**liquid, solid, and gas**

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

108. A(n) \_\_\_\_\_ has a uniform composition throughout.  
**homogeneous mixture**

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

109. A(n) \_\_\_\_\_ does not have a uniform composition throughout.  
**heterogeneous mixture**

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: automatic  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

**Precision**

*Blooms: 2. Understand  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Measurement (SI Units)  
Topic: Study of Chemistry*

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

**Graduated or Calibrated**

*Blooms: 2. Understand  
Difficulty: Medium  
Gradable: automatic  
Subtopic: Measurement (SI Units)  
Topic: Study of Chemistry*

112. What is something that has a definite composition?  
pure substance

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: manual  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: manual  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: manual  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: manual  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

116. Give examples of three physical properties.  
(Answers will vary.) Melting point, boiling point, density, color

*Blooms: 2. Understand  
Difficulty: Easy  
Gradable: manual  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

117. Give an example of an *extensive* property.  
(Answers will vary.) Mass, length, and volume

*Blooms: 3. Apply  
Difficulty: Easy  
Gradable: manual  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

118. Give an example of an *intensive* property.  
(Answers will vary.) Temperature, density, melting point, boiling point

*Blooms: 3. Apply*  
*Difficulty: Easy*  
*Gradable: manual*  
*Subtopic: Properties of Matter*  
*Topic: Study of Chemistry*

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

*Blooms: 4. Analyze*  
*Difficulty: Easy*  
*Gradable: manual*  
*Subtopic: Properties of Matter*  
*Topic: Study of Chemistry*

120. What is the equation for the conversion of Celsius temperatures to Kelvin temperatures?  
 $^{\circ}\text{C} + 273.15 = \text{K}$

*Blooms: 2. Understand*  
*Difficulty: Easy*  
*Gradable: manual*  
*Subtopic: Dimensional Analysis*  
*Subtopic: Measurement (SI Units)*  
*Topic: Study of Chemistry*

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.  
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.

*Blooms: 2. Understand*  
*Difficulty: Medium*  
*Gradable: manual*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

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

*Blooms: 2. Understand*  
*Difficulty: Easy*  
*Gradable: manual*  
*Subtopic: Scientific Notation and Significant Figures*  
*Topic: Study of Chemistry*

123. What is the equation used to calculate the mass from the density?  
 $\text{mass} = \text{density} \times \text{volume}$  or  $m = dV$

*Blooms: 2. Understand*  
*Difficulty: Medium*  
*Gradable: manual*  
*Subtopic: Dimensional Analysis*  
*Topic: Study of Chemistry*

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

*Blooms: 2. Understand*  
*Difficulty: Medium*  
*Gradable: manual*  
*Subtopic: Scientific Method*  
*Topic: Study of Chemistry*

125. Explain the difference between quantitative measurements and qualitative measurements.  
A quantitative measurement is expressed with a number, whereas a qualitative measurement does not require an explicit measurement.

*Blooms: 2. Understand*  
*Difficulty: Easy*  
*Gradable: manual*  
*Subtopic: Scientific Method*  
*Topic: Study of Chemistry*

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

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.

*Blooms: 2. Understand  
Difficulty: Easy  
Gradable: manual  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

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

*Blooms: 2. Understand  
Difficulty: Medium  
Gradable: manual  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

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

*Blooms: 2. Understand  
Difficulty: Medium  
Gradable: manual  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry*

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

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.

*Blooms: 2. Understand  
Difficulty: Easy  
Gradable: manual  
Subtopic: Scientific Notation and Significant Figures  
Topic: Study of Chemistry*

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

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

*Blooms: 2. Understand  
Difficulty: Easy  
Gradable: manual  
Subtopic: Classification and States of Matter  
Subtopic: Properties of Matter  
Topic: Study of Chemistry*

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

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.

*Blooms: 2. Understand  
Difficulty: Easy  
Gradable: manual  
Subtopic: Measurement (SI Units)  
Topic: Study of Chemistry*

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

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.

*Blooms: 2. Understand  
Difficulty: Medium  
Gradable: manual  
Subtopic: Scientific Method  
Topic: Study of Chemistry*

133. Explain the difference between accuracy and precision.

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.

*Blooms: 2. Understand*  
*Difficulty: Medium*  
*Gradable: manual*  
*Subtopic: Measurement (SI Units)*  
*Topic: Study of Chemistry*

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