Chapter 01
Matter and Measurement

Multiple Choice Questions

1. Which is not an example of a pure substance?
A. Sugar
B. Air
C. Aluminum foil
D. Water
E. A block of dry ice

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

2. Which is an example of a physical change?
A. The rusting of an iron nail
B. The burning of propane in a gas grill
C. Baking cookies
D. Polishing tarnished silver
E. Melting of an ice cube in a glass of soda

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

3. Which measurement has the fewest number of significant figures?
A. 12.80 m
B. 0.1280 m
C. 0.001280 m
D. 1280 m
E. All of the measurements have the same number of significant figures.

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

4. Which quantity is an exact number?
A. 3 cars
B. 1,000 m
C. 2 L
D. 453.6 g

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

5. The number 0.0035880 expressed correctly using scientific notation is
A. 0.0035889
B. 3.5880×10^{3}
C.

3.5880×10^{-3}

D. 3.5880×10^{-4}
E. 3.588×10^{-3}

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

6. The measurement 78,005,760 expressed correctly using scientific notation is
A. 7.8005760×10^{7}
B. 7.8005760×10^{-7}
C. 7.8×10^{7}
D.

7.800576×10^{-7}

E.

7.800576×10^{7}

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

7. When 4.870×10^{-3} is correctly converted to its standard form the number becomes
A. 4870
B. 4870.
C. 0.00487
D. 0.004870
E. 0.0004870

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

8. Which number is the largest?
A. 4.38×10^{3}
B. 4.38×10^{2}
C. 4.38×10^{-3}
D. 4.38×10^{-2}
E. 438

Bloom's Level: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

9. Which number is the smallest?
A. 4.38×10^{3}
B. 4.38×10^{2}
C. 4.38×10^{-3}
D. 4.38×10^{-2}
E. 438

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

10. When 0.022189 is correctly rounded to two significant figures the number becomes
A. 0.02
B. 0.022
C. 22
D. 0.023

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

11.

When 5.5490×10^8 is correctly rounded to three significant figures the number becomes

A. 5.55
B. 5.55×10^8
C. 555
D. 554
E. 5.54×10^8

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

12. Which number contains four significant figures?
A. 3.978
B. 0.780
C. 0.0085
D. 1700
E.

Two or more of the numbers contain four significant figures.

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

13. Carry out the following calculation and report the answer using the proper number of significant figures: 38.251 + 73.1

A. 111
B. 111.3
C. 111.4
D. 111.35
E. 111.351

Bloom's Level: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

14. Carry out the following calculation and report the answer using the proper number of significant figures:
549.101 + 8.12 + 95.0076 – 651.9

A. 3.286
B. 0.3286
C. 0.33
D. 0.3
E. 1268.1

Bloom's Level: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

15. Carry out the following calculation and report the answer using the proper number of significant figures:
38.251×73.1
A. 2796.1481
B. 2796.15
C. 2796.1
D. 2796
E. 2.80×10^3

Bloom's Level: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

16.

Carry out the following calculation and report the answer using the proper number of significant figures:

$\frac{16.75\ \text{ft}}{0.54\ \text{s}}$

A. 31.0185 ft/s
B. 31.01 ft/s
C. 31.02 ft/s
D. 31.0 ft/s
E. 31 ft/s

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

17. What is the correct metric relationship between milliliters and microliters?
A. 1 milliliter = 1 microliter
B. 1,000 milliliters = 1 microliter
C. 1 milliliter = 1,000 microliters
D. 1,000,000 milliliters = 1 microliter
E. 1 milliliter = 1,000,000 microliters

Bloom's Level: 4. Analyze
Difficulty: Medium
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

18. Which metric relationship is incorrect?
A. 1 milligram = 1,000 grams
B. 1 dL = 100 mL
C. 1 km = 1,000 m
D. 100 cg = 1 g
E. 1 liter = 1,000,000 microliters

Bloom's Level: 4. Analyze
Difficulty: Medium
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

19. Which is the proper conversion factor for converting a mass expressed in pounds (lb) to the same mass expressed in grams (g)?

A. $\frac{1\text{ lb}}{454\text{ g}}$

B. $\frac{1\text{ g}}{454\text{ lb}}$

C. $\frac{454\text{ g}}{1\text{ lb}}$

D. $\frac{454\text{ lb}}{1\text{ g}}$

Bloom's Level: 4. Analyze
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

20. Which length is the longest?

A. 12 m
B. 12,000 mm
C. 12,000 μm

D. 12,000 cm
E. 0.0012 km

Bloom's Level: 4. Analyze
Difficulty: Hard
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

21. What is the mass in kilograms of an individual who weighs 197 lb?
A. 197 kg
B. 8.95 kg
C. 89.5 kg
D. 90 kg
E. 433 kg

Bloom's Level: 5. Evaluate
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

22. If a balloon has a volume of 21.6 cups, what is the volume of this balloon expressed in L?
A. 86.4 L
B. 81.51 L
C. 5.72 L
D. 5.094 L
E. 5.09 L

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

23. Which volume is equivalent to 225 mL?

A.

2.25×10^{5} μL

B.

2.25×10^{2} μL

C. 2.25 L

D.

2.25×10^{-5} μL

E.

0.225 μL

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

24. If a package of nuts weighs 41.3 oz, what is the mass of the package expressed in milligrams?

A. 1.17 mg
B. 1.17×10^{3} mg
C. 1.17×10^{6} mg
D. 117 mg
E. 3.00×10^{5} mg

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

25. If a tree is 89.5 cm tall, what is the tree's height expressed in yards?
A. 0.979 yd
B. 6.31 yd
C. 18.9 yd
D. 35.2 yd
E. 227 yd

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

26. If honey has a density of 1.36 g/mL, what is the mass of 1.25 qt, reported in kilograms?
A. 1.60 kg
B. 1.6×10^3 kg
C. 0.974 kg
D. 974 kg
E. 1.80 kg

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Density and Specific Gravity
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

27. If a piece of rock has a volume of 0.73 L and a mass of 1524 g, what is the density of the rock in g/mL?
A. 2.1×10^{3} g/mL
B. 0.48 g/mL
C. 4.8×10^{-4} g/mL
D. 2.1 g/mL
E. 2.088 g/mL

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Density and Specific Gravity
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

28. A hiker with hypothermia has a body temperature of 82 °F. What is his body temperature in °C?
A. 14 °C
B. 28 °C
C. 31 °C
D. 50 °C

Bloom's Level: 5. Evaluate
Difficulty: Medium
Gradable: automatic
Subtopic: Temperature
Topic: Study of Chemistry

29. On an autumn day in Washington, DC the outdoor temperature was 21 °C. What was this outdoor temperature in °F?
A. 44 °F
B. 57 °F
C. 69 °F
D. 70 °F

Bloom's Level: 5. Evaluate
Difficulty: Medium
Gradable: automatic
Subtopic: Temperature
Topic: Study of Chemistry

30. An oven is set for a temperature of 298 °F. What is the oven temperature in K?
A. 166 K
B. 421 K
C. 148 K
D. 571 K
E. 439 K

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Temperature
Topic: Study of Chemistry

31. Which of the following temperatures is the hottest?
A. 100 °C
B. 100 °F
C. 100 K
D. All would feel equally warm.

Bloom's Level: 4. Analyze
Difficulty: Medium
Gradable: automatic
Subtopic: Temperature
Topic: Study of Chemistry

32. The recommended dietary allowance for calcium for teenage children is 1,300 mg per day. If a typical 8.0-fl oz glass of reduced-fat milk contains 298 mg of calcium, how many fluid ounces of milk does a teenager need to drink to get the entire recommended amount of calcium from this milk?
A. 4.4 fl oz
B. 1.8 fl oz
C. 3.5 fl oz
D. 35 fl oz
E. 32 fl oz

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

33. What is the density of a sample of rubbing alcohol if it has a specific gravity of 0.789?
A. 1.27 g/mL
B. 0.789 g/mL
C. 1.00 g/mL
D. 0.895 g/mL

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Density and Specific Gravity
Topic: Study of Chemistry

34. Which of the following conversions is correct and expresses the answer using the proper number of significant figures?
A.

$$3.779\ \text{lb} \times \frac{454\ \text{g}}{1\ \text{lb}} \times \frac{1{,}000\ \text{mg}}{1\ \text{g}} = 1.7 \times 10^{6}\ \text{mg}$$

B.

$$553\ \text{dL} \times \frac{1\ \text{L}}{10\ \text{dL}} \times \frac{10^{3}\ \text{mL}}{1\ \text{L}} = 5.5 \times 10^{4}\ \text{mL}$$

C.

$$623\ \text{mm} \times \frac{1\ \text{m}}{10^{9}\ \text{mm}} \times \frac{39.4\ \text{in}}{1\ \text{m}} = 2.45 \times 10^{-5}\ \text{in}$$

D. $623\ \text{mm} \times \frac{1\ \text{m}}{10^{6}\ \text{mm}} \times \frac{39.4\ \text{in}}{1\ \text{m}} = 2.45 \times 10^{-2}\ \text{in}$

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

35. What is the mass in grams of 85.32 mL of blood plasma with a density of 1.03 g/mL?
A. 85.32 g
B. 82.83 g
C. 82.8 g
D. 87.88 g
E. 87.9 g

Bloom's Level: 5. Evaluate
Difficulty: Medium
Gradable: automatic
Subtopic: Density and Specific Gravity
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

36. If a 185-lb patient is prescribed 145 mg of the cholesterol lowering drug Tricor daily, what dosage is the patient receiving in mg/kg of his body weight?
A. 0.784 mg/kg
B. 1.28 mg/kg
C. 0.356 mg/kg
D. 1.72 mg/kg
E. 0.580 mg/kg

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

37. The estimated average daily requirement of folic acid for pregnant females is 520 micrograms. Which accurately expresses this value?
A. 520 mg
B. 520 Mg
C. 520 mG
D.

520 μg

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

38. For a person between the ages of 10 and 29, the normal range of blood triglycerides is 53 $\times$ 10^4 mg/dL. What is the correct interpretation of the units in this measurement?
A. milligrams times deciliter
B. micrograms per deciliter
C. megagrams per deciliter
D. milligrams per deciliter

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

39. A patient's urine sample has a density of 1.02 g/mL. If 1250 mL of urine was excreted by the patient in one day, what mass of urine was eliminated?
A. 1.28 kg
B. 1225 g
C. 1275 g
D. 128 g

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Density and Specific Gravity
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

40.

The density of human urine is normally between 1.003 and 1.030 g/mL, and is often used as a diagnostic tool. If a 25.00 mL sample of urine from a patient has a mass of 26.875 g, how does the density of the urine sample compare to the normal range?

A. the density of the sample is lower than the normal range
B. the density of the sample is greater than the normal range
C. the density of the sample is within the normal range
D. there is insufficient information to make a comparison

Bloom's Level: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Density and Specific Gravity
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

41. Which volume has the most uncertainty associated with the measurement?
A. 10 mL
B. 10.0 mL
C. 10.00 mL
D. all have the same degree of uncertainty

Bloom's Level: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

42. Air has a density of 0.001226 g/mL. What volume of air would have a mass of 1.0 lb?
A. 2.7 mL
B. 815.6 mL
C. 37 mL
D.

3.7×10^2 L

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Density and Specific Gravity
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

43. A beaker contains 145.675 mL of a saline solution. If 24.2 mL of the saline solution are removed from the beaker, what volume of solution remains?
A. 121.475 mL
B. 121.4 mL
C. 121.5 mL
D. 121 mL

Bloom's Level: 4. Analyze
Difficulty: Medium
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

True / False Questions

44. PVC plastic, which is used in pipes, is an example of a synthetic material.
TRUE

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

45. Nitrogen gas (N_2) would properly be classified as a compound.

FALSE

Bloom's Level: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

46. Changes in state such as melting and boiling are physical changes.
TRUE

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

47. A compound cannot be broken down into simpler substances.

FALSE

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

48.

The water molecules in this image are best described as being in the liquid state.

FALSE

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

49. The base unit for mass in the metric system is kilograms (kg).
FALSE

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

50. The base unit for volume in the metric system is liter (L).
TRUE

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

51. An inexact number results from a measurement or observation and contains some uncertainty.
TRUE

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

52. A zero counts as a significant figure when it occurs at the end of a number that contains a decimal point.
TRUE

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

53. 8 mL is larger than 8 dL.
FALSE

Bloom's Level: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

54. Specific gravity is a quantity that compares the density of a substance with the density of water.
TRUE

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Density and Specific Gravity
Topic: Study of Chemistry

55. The specific gravity of a substance has units of g/mL.
FALSE

Bloom's Level: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Density and Specific Gravity
Topic: Study of Chemistry

56. When the liquid carbon tetrachloride (density = 1.59 g/mL) is added to water, the top layer will be the water layer.
TRUE

Bloom's Level: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Density and Specific Gravity
Topic: Study of Chemistry

57. When a piece of magnesium (density = 1.738 g/mL) is placed in a container of liquid carbon tetrachloride (density = 1.59 g/mL), the piece of magnesium will float on top of the carbon tetrachloride.
FALSE

Bloom's Level: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Density and Specific Gravity
Topic: Study of Chemistry

58. In reading a number with a decimal point from left to right, all digits starting with the first nonzero number are significant figures.
TRUE

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

59. The number 900,027,300 has four significant figures.
FALSE

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

60. The number 900,027,300 has nine significant figures.
FALSE

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

61.

The two conversion factors for the equality 1 in = 2.54 cm are properly shown below.

$\frac{1\text{ in}}{2.54\text{ cm}}$ and $\frac{2.54\text{ in}}{1\text{ cm}}$

FALSE

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

62. Dissolving sugar in water involves a chemical change.
FALSE

Bloom's Level: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

63.

One-thousand (1,000) ms is the same length of time as one (1) μs.

FALSE

Bloom's Level: 4. Analyze
Difficulty: Medium
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

64. Assuming the numbers are measured values, when multiplying 762.85 by 15 the answer should be reported with two significant figures.
TRUE

Bloom's Level: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

65. When subtracting 15 from 762.85 the answer should be reported with two significant figures.
FALSE

Bloom's Level: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

66. In scientific notation, a number is written as $y \times 10^x$, where x can be any positive or negative number or fraction.
FALSE

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

67. If the density of a substance is greater than 1 g/mL, the mass of a sample of this substance will be greater than the volume of the sample.
TRUE

Bloom's Level: 4. Analyze
Difficulty: Medium
Gradable: automatic
Subtopic: Density and Specific Gravity
Topic: Study of Chemistry

68. Dividing a number by 10^5 is the same as multiplying a number by 10^{-5}.
TRUE

Bloom's Level: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

69. The measurement 10.3 cm has more significant figures than the measurement 10.3 m.
FALSE

Bloom's Level: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

70. The density of olive oil is greater at 200 °C than at 25 °C.
FALSE

Bloom's Level: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Density and Specific Gravity
Topic: Study of Chemistry

71. One Kelvin is the same size as one degree Celsius.
TRUE

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Temperature
Topic: Study of Chemistry

72. The temperature 60 °C is higher than 60 °F.
TRUE

Bloom's Level: 5. Evaluate
Difficulty: Medium
Gradable: automatic
Subtopic: Temperature
Topic: Study of Chemistry

73. The temperature –60 °C is higher than –60 °F.
FALSE

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Temperature
Topic: Study of Chemistry

74. The temperature 60 °C is higher than 60 K.
TRUE

Bloom's Level: 5. Evaluate
Difficulty: Medium
Gradable: automatic
Subtopic: Temperature
Topic: Study of Chemistry

75. Elements and compounds are both classified as pure substances.
TRUE

Bloom's Level: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

76. The terms used in conversion factors must always be exact numbers.
FALSE

Bloom's Level: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

77. The number 87,927,000 is larger than the number 9.7×10^6.
TRUE

Bloom's Level: 4. Analyze
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

78. The number 0.0007270 is larger than the number 5.7×10^{-3}.
FALSE

Bloom's Level: 4. Analyze
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

79. A mixture can be separated into its components by physical changes.
TRUE

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

80.

For a number written in scientific notation, a negative exponent indicates the value of the number is less than 1.

TRUE

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

81. The meaning of the metric prefix *milli-* is 1000.
FALSE

Bloom's Level: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

Fill in the Blank Questions

82. A _____ change converts one material to another.
chemical

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

83. The measurement 0.030500 m has _____ significant figures.
five or 5

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

84.

When the measurement 340,942 s is rounded to two significant figures, the value is properly reported as _____.

340,000 s or 3.4 × 105 s

Bloom's Level: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

85. To use conversion factors to solve a problem, set up the problem with any unwanted unit in the numerator of one term and the _____ of another term, so that unwanted units cancel.
denominator

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

86. If you have equal masses of two different substances (A and B), and the density of A is twice the density of B, then the volume of A is _____ the volume of B.
one-half or ½

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Density and Specific Gravity
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

87. Every measurement is composed of a number and a _____.
unit

Bloom's Level: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Measurements (Metric and SI Units)
Topic: Study of Chemistry

88. A small banana contains 323 mg of the nutrient potassium. You would need to eat approximately _____ small bananas in one day to obtain the recommended daily intake of 3.5 g of potassium.
11

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

89. The measurement 5342 nm is the same length as _____ cm, written in scientific notation.
5.342×10^{-4}

Bloom's Level: 5. Evaluate
Difficulty: Hard
Gradable: automatic
Subtopic: Dimensional Analysis
Subtopic: Measurements (Metric and SI Units)
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

90. When crude oil leaks into the ocean from an oil tanker, the crude oil floats because it is _____ dense than water.

less

Bloom's Level: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Density and Specific Gravity
Topic: Study of Chemistry