Prep for Basic Chemistry: Competency 3 Practice Key

NOTE: Please be careful to use the significant digit rules, round correctly, and include the correct units.

1. Which of the following lists arranges units from smallest to largest?
   - A  1 dg, 1 kg, 1 mg, 1 cg, 1 g
   - B  1 cg, 1 dg, 1 mg, 1 g, 1 kg
   - C  1 mg, 1 cg, 1 dg, 1 g, 1 kg
   - D  1 g, 1 dg, 1 cg, 1 mg, 1 kg

2. At 100° F, water boils.
   - A  True
   - B  False

3. Fahrenheit scale (F)
   - A  sets the freezing point of water at 0°F and the boiling point of water at 100°F
   - B  sets the freezing point of water at 32°F and the boiling point of water at 212°F

4. Density equals mass divided by volume.
   - A  True
   - B  False

5. A colorless substance that boils at 100°C and freezes at 32°C would most likely be water.
   - A  True
   - B  False

6. “Mass” is
   - A  a measure of the amount of matter in an object.
   - B  the same as weight
   - C  the starting substance in a chemical reaction.

7. 123 mm = 12.3 cm

8. 12030 m = 12.03 km

9. 20,000 L = 20 kL

10. 33 mg = 3.3 cg

11. 80 °F = 30 °C

12. -24 °C = -11 °F

13. 0.0 °F = -20 °C

14. 32 °C = 90 °F

*Continued*
15. There are five boxes, each a different color—pink, orange, red, blue, and purple. Each box has a different mass and a different volume. Figure out the mass, volume, or density of each object from the following information:

- The orange box has a volume of 45.0 cm\(^3\) and a density of 0.756 g/cm\(^3\). \(M = 34.0 \text{ g}\)
- The pink box has a volume of 48 cm\(^3\) and a density of 0.50 g/cm\(^3\). \(M = 24 \text{ g}\)
- The red box has a volume of 70.0 cm\(^3\) and a mass of 74 g. \(D = 1.1 \text{ g/cm}^3\)
- The blue box has a density 2.70 g/cm\(^3\) and a mass of 64.0 g. \(V = 23.7 \text{ cm}^3\)

16. An object has a volume of 55.9 cm\(^3\) and a density of 0.751 g/cm\(^3\). Its specific gravity = 0.751

17. An object has a specific gravity of 1.35 and a mass of 11.5 g. Its density = 1.35 g/cm\(^3\)

18. An object has a mass of 50.8 g and a volume of 18.2 cm\(^3\). Its specific gravity = 2.79

19. 122 pounds = 55.5 Kg

20. 122 cm = 48.0 inches

21. 125 cm\(^3\) = 125 mL

22. 13 cm\(^3\) of water weighs 13 g.

23. 1.2 mL of water weighs 1.2 g.

24. 2.5 L of milk = 2.6 quarts

25. 6.37 km = 3.98 miles

Please use these Customary (English) \(\leftrightarrow\) SI (Metric) measurement conversion factors:

- 1 inch = 2.54 centimeters
- 2.2 pounds = 1 kilogram
- 1 quart = 0.95 liter
- 1 mile = 1.6 kilometers