

STAAR Science Tutorial 18 **TEK 6.6B: Density**

TEK 6.6B: Calculate density to identify an unknown substance.

Density

- Density is a measure of the mass of a substance per unit of volume. It is stated in grams per milliliter (g/mL) or cubic centimeter (g/cm³) or kilograms per liter (kg/L).
- To calculate density, divide the mass of a sample by its volume. For example, if a sample has a mass of 10.0 grams and a volume of 5.0 mL, its density is 2.0 g/mL.
- Density can be used to help determine the identity of a substance. All pure substances have a known density that can be compared to the density of an unknown substance.
- Substances with a density of less than water (1.0 g/mL) float in water, while substances with a density greater than water will sink.

Practice Problems

1. A sample of a metal has a mass of 23.4 g and a volume of 3.0 mL. What is the sample's most likely identity?
 - A. Aluminum (2.8 g/mL)
 - B. Iron (7.8 g/mL)
 - C. Copper (8.9 g/mL)
 - D. Gold (19.3 g/mL)
2. What is the density of a substance with a mass of 15.0 g and a volume of 5.0 mL?
 - A. 0.33 g/mL
 - B. 3.0 g/mL
 - C. 10.0 g/mL
 - D. 20.0 g/mL