

Measuring Matter

Grade 5 • SCIENCE • Students practice comparing and calculating basic properties of matter using mass, volume, and density. • Standards: 5-PS1-3

Read each problem carefully and use what you know about mass, volume, and density to answer the questions. Show your work when needed!

1. A rock has a mass of 150 grams. What is its mass in grams?
2. A container holds 200 milliliters of water. If you pour out 75 milliliters, how much water is left in the container?
3. Object A has a mass of 80 grams and Object B has a mass of 120 grams. Which object has more mass?
4. A wooden block takes up 50 cubic centimeters of space. What is the volume of the block?
5. Maria measures a marble and finds it has a mass of 25 grams and a volume of 10 cubic centimeters. What is the density of the marble? (Hint: density = mass divided by volume)
6. Two balls have the same volume. Ball X has a mass of 300 grams and Ball Y has a mass of 450 grams. Which ball is more dense?
7. A metal cube has a mass of 240 grams and a volume of 30 cubic centimeters. What is its density?
8. Substance P has a density of 3 grams per cubic centimeter and Substance Q has a density of 5 grams per cubic centimeter. If you have 20 cubic centimeters of Substance Q, what is its mass?
9. A piece of clay has a mass of 180 grams and a density of 1.5 grams per cubic centimeter. What is the volume of the clay?

10. Two objects have the same mass of 400 grams. Object J has a volume of 50 cubic centimeters and Object K has a volume of 500 cubic centimeters. Which object is denser? Will each object sink or float in water?

Answer Key — Measuring Matter

For the teacher / parent. Do not distribute with the worksheet.

1. 150 grams
2. 125 milliliters ($200 - 75 = 125$)
3. Object B
4. 50 cubic centimeters
5. 2.5 grams per cubic centimeter ($25 \div 10 = 2.5$)
6. Ball Y (*Ball Y has more mass in the same volume, so it is more dense*)
7. 8 grams per cubic centimeter ($240 \div 30 = 8$)
8. 100 grams ($5 \times 20 = 100$)
9. 120 cubic centimeters ($180 \div 1.5 = 120$)
10. Object J is denser (8 g/cm^3); Object J will sink and Object K will float. (*Density = mass divided by volume. J: $400/50 = 8 \text{ g/cm}^3$ (denser than water, so it sinks). K: $400/500 = 0.8 \text{ g/cm}^3$ (less dense than water, so it floats).*)