Skills Practice Lab DATASHEET FOR LABBOOK

Book K Ch 1 Determining Density

The density of an object is its mass divided by its volume. But how does the density of a small amount of a substance relate to the density of a larger amount of the same substance? In this lab, you will calculate the density of one marble and of a group of marbles. Then, you will confirm the relationship between the mass and volume of a substance.

MATERIALS

- balance, metric
- graduated cylinder, 100 mL
- marbles, glass (8–10)
- paper, graph
- paper towels
- water

SAFETY INFORMATION

PROCEDURE

1. Use the table below to record your data.

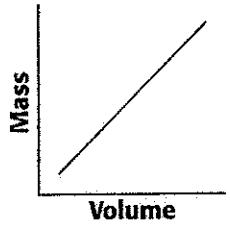
Mass of marble (g)	Total mass of marbles (g)	Total volume (mL)	Volume of marbles (mL) (total volume minus 50.0 mL)	Density of marbles (g/mL) (total mass divided by volume)

2. Fill the graduated cylinder with 50 mL of water. If you put in too much water, twist one of the paper towels, and use it to absorb excess water.
3. Measure the mass of a marble as accurately as you can (to at least .01 g). Record the mass in the table.
4. Carefully drop the marble in the tilted cylinder, and measure the total volume. Record the volume in the third column.
5. Measure and record the mass of another marble. Add the masses of the marbles together, and record this value in the second column of the table.
6. Carefully drop the second marble in the graduated cylinder. Complete the row of information in the table.
7. Repeat steps 5 and 6. Add one marble at a time. Stop when you run out of marbles, the water no longer completely covers the marbles, or the graduated cylinder is full.

ANALYZE THE RESULTS

1. Examine the data in your table. As the number of marbles increases, what happens to the total mass of the marbles? What happens to the volume of the marbles? What happens to the density of the marbles?

2. Graph the total mass of the marbles (y-axis) versus the volume of the marbles (x-axis). Is the graph a straight line?



DRAW CONCLUSIONS

3. Does the density of a substance depend on the amount of substance present? Explain how your results support your answer.

APPLYING YOUR DATA

Calculate the slope of the graph. How does the slope compare with the values in the column entitled "Density of marbles"? Explain.