

SECTION **1-3** **Volume and Density** (pages 20-27)

KEY CONCEPTS

- ▲ Matter is anything that has mass and volume.
- ▲ Density is the mass per unit volume of an object.

Vocabulary Skills: Using Definitions

Write a short paragraph in which you explain how the following terms are related.

matter mass volume density property

The Case of the Missing Crown: Exploring the Main Ideas

Imagine that you are living in Europe in the Middle Ages. You have been summoned by the king of your land to help in a very important matter. Someone has stolen the king's solid gold crown. The king has issued a proclamation offering a reward of 500 gold coins for the safe return of his crown. The problem is that the king has received hundreds of crowns—and they all look exactly like the missing crown! Your job as a brilliant scientist is to find out which crown is the real one. The chart below shows some data that you have collected on one batch of crowns. Study the data, then answer the questions.

Crown #	Volume (cm ³)	Mass (g)	
1	180	1890	
2	180	486	
3	180	1404	
4	180	3474	
5	180	2034	

1. What property of each crown can you determine from this data? Why is this property valuable?

2. In the spaces provided to the right of the data, calculate the property that you named in question 1.

3. Based on your calculations, do you think that any of these crowns could be the real one? Why or why not?

4. Which of these crowns do you think are fakes? Why?

5. Can you guess what the fake crowns are made of? On what did you base your guess?

6. How do you think the fake crowns were made to look like the real crown?
