Chapter 4 Review

Make Your Own Summary

Summarize the key concepts in this chapter using a graphic organizer. The Chapter Summary on the previous page will help you identify the key concepts. Refer to Study Toolkit 4 on pages 566–567 to help you decide which graphic organizer to use.

Reviewing Key Terms

1. A _____ of a substance can be observed without forming a new substance. (4.2)

2. Dividing the mass of an object by the volume of the object is a way to calculate _____. (4.2)

3. A sample of matter that cannot be broken down into simpler parts by ordinary chemical methods is a(n) _____. (4.1)

4. If there is only one kind of particle in a sample, the sample must be a(n) _____. (4.1)

5. The combustibility of a substance is a _____ property. (4.3)

6. A material that can be broken down by chemical methods is a(n) _____. (4.1)

Knowledge and Understanding K/U

7. Identify each of the following properties as physical or chemical.

a. Gallium can melt in your hand.

b. Aluminum is a good conductor of heat and electric current.

c. Kerosene can burn.

d. Limestone bubbles when an acid touches it.

e. A balloon filled with radon gas falls to the floor when released.

f. A metal is easy to bend.

g. Peroxide reacts with melanin in hair.

8. Describe the difference between two elements that form a compound and the same two elements in a mixture.

9. How do the particles in a pure substance compare with each another?

10. The density of pure silver is 10.5 g/cm^3. What is the mass of a sample with a volume of 10.0 cm^3?

11. Suppose that you have two samples with the same volume, but the mass of sample A is larger than the mass of sample B. Which sample has the higher density? Explain your answer.

12. What property must a substance have if you want to use the substance to make an aqueous solution?

13. Classify each of the following as an element, a compound, or a mixture.

a. aluminum

b. air

c. sugar

d. orange juice

e. DDT

f. tin

14. What chemical property of magnesium is illustrated in the photo below?

15. What type of property of a pure substance describes how that substance might form a new substance?

16. What properties of diamonds make them useful in industrial applications?

17. Calculate the density using the given information. **Hint:** 1 mL = 1 cm^3

a. A 35.7 g sample occupies 5.01 cm^3.

b. A 2.56 L balloon contains 3.66 g of gas.

c. A 45.3 g sample placed in a graduated cylinder causes the water level to rise from 25.0 mL to 41.8 mL.

18. Briefly describe the difference between an element and a compound.

19. How do the chemical properties of peroxide make it suitable for use in hair dyes? What are the hazards associated with its use?

Thinking and Investigation T/I

20. Suppose that you are comparing several objects. Is it correct to say that the object with the largest volume has the largest mass? Explain your reasoning, and include an example.

21. A chemist working in the lab wants to remove his goggles and apron as soon as he has finished collecting data. He has not yet cleaned up the lab area, however. What would you say to convince him that he needs to keep on his goggles and apron?

22. Use the following data to answer the question below.

Densities of Common Liquids

Substance	Density (g/cm^3)
water	1.00
cooking oil	0.894
corn syrup	1.36

The mass of an empty container is measured and found to be 55.75 g. The container is filled to the rim with water. Its mass is measured again and found to be 105.75 g. The container is emptied and dried with a paper towel to remove any traces of water. It is then filled with an unknown liquid. The new mass is 123.75 g. Use calculations to determine if the unknown liquid is cooking oil or corn syrup.

Communication C

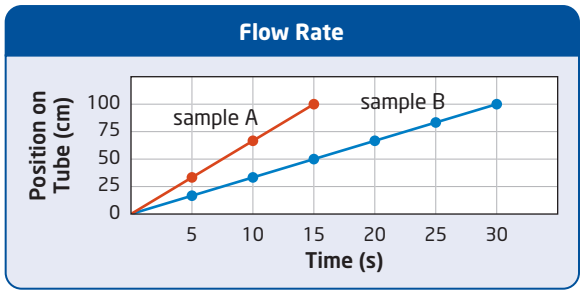
23. BIG IDEAS The use of elements and compounds has both positive and negative effects on society and the environment. Make a table that shows the negative and positive effects of DTT use in society.

24. BIG IDEAS Elements and compounds have specific physical and chemical properties that determine their practical uses. Write an advertisement for diamonds, emphasizing how their properties make them useful for many applications.

25. Explain why density is more useful for identifying a substance than either mass or volume alone.

Application A

26. The following graph shows how long it takes two different liquids to flow through a 100 cm length of tubing. Use this graph to determine which fluid is more viscous. Explain your answer.



27. Use the particle model of matter to describe what happens when you "see your breath" on a cold day.

28. A facial tissue, a sheet of paper, and a cardboard box are all made from wood fibres. Discuss how the physical properties of each material make it useful for its intended purpose. Name a chemical property that these three materials have in common.

29. How do the properties of water contribute to its use as a coolant in car radiators?