Prepare Your Own Summary

In this chapter, you learned to define and categorize isotopes in terms of atomic number and mass number and to explain the decay of radioactive isotopes in terms of changes to the nucleus. You also investigated half-life with reference to rates of radioactive decay. You compared fission and fusion. Create your own summary of the key ideas from this chapter. You may include graphic organizers or illustrations with your notes. (See Science Skill 11 for help with graphic organizers.) Use the following headings to organize your notes:

1. Isotopes and Radioactivity
2. Three Types of Radioactive Decay
3. Half-Life
4. Comparing Fission and Fusion

Checking Concepts

1. What is radiation?
2. What is a radioisotope?
3. (a) List three kinds of radioactive decay.
   (b) State what kind of particle or ray is produced by each type.
   (c) State the electric charge of each of the three kinds of radioactive decay.
4. Write two different symbols used to represent alpha particles.
5. (a) How are the atoms in magnesium-24 and magnesium-26 similar?
   (b) How are they different?
6. Which subatomic particle determines the identity of an element?
7. What subatomic particles are present in an alpha particle?
8. Why does a beta particle have a negative charge?
9. How does the release of an alpha particle by an atom change that atom into a different element?
10. Draw a Bohr model showing the number of protons, neutrons, and the electron arrangement (including pairs and single electrons) for the following atoms.
    (a) carbon-14
    (b) carbon-15
    (c) carbon-16
    (d) sodium-22
    (e) sodium 23
11. Copy and complete the following table in your notebook.

Isotope	Mass Number	Atomic Number	Number of Neutrons
lithium-7			
neon-22			
		14	15
		8	8
	24		12
	26		14

12. A sample of rock contains 128 g of a radioisotope. State how much of the radioisotope will remain after:
    (a) two half-lives
    (b) four half-lives
13. Rock containing potassium-40 and argon-40 is melted and then solidified. Explain why this process sets the potassium-40 clock to zero.
14. What is a nuclear reaction?
15. How does a nuclear reaction differ from a chemical reaction?
16. What is a nuclear equation?
17. What two quantities do not change during a nuclear reaction?
18. How is it possible to induce a nuclear reaction?