

Chapter Review *continued*

- _____ 9. Which of the following determines the identity of an element?
- a. atomic number
 - b. mass number
 - c. atomic mass
 - d. overall charge
- _____ 10. Isotopes exist because atoms of the same element can have different numbers of
- a. protons.
 - b. neutrons.
 - c. electrons.
 - d. None of the above

Short Answer

11. What force holds electrons in atoms?

12. In two or three sentences, describe Thomson's plum-pudding model of the atom.

Math Skills

13. Calculate the atomic mass of gallium, which consists of 60% gallium-69 and 40% gallium-71. Show your work below.
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14. Calculate the number of protons, neutrons, and electrons in an atom of zirconium-90 that has no overall charge and an atomic number of 40. Show your work below.

Chapter Review *continued*

CRITICAL THINKING

15. **Concept Mapping** Use the following terms to create a concept map: *atom, nucleus, protons, neutrons, electrons, isotopes, atomic number, and mass number.*

Chapter Review *continued*

16. **Analyzing Processes** Particle accelerators are devices that speed up charged particles in order to smash them together. Scientists use these devices to make atoms. How can scientists determine whether the atoms formed are a new element or a new isotope of a known element?

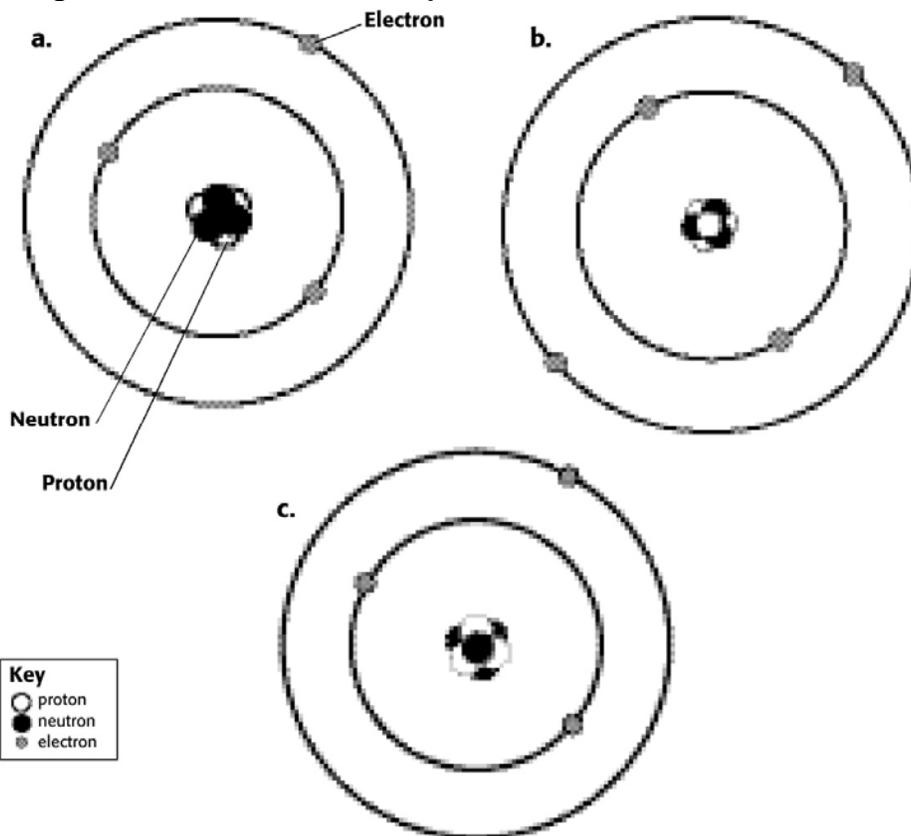
17. **Analyzing Ideas** John Dalton made a number of statements about atoms that are now known to be incorrect. Why do you think his atomic theory is still found in science textbooks?

18. **Analyzing Methods** If scientists had tried to repeat Thomson's experiment and found that they could not, would Thomson's conclusion still have been valid? Explain your answer.

Chapter Review *continued*

INTERPRETING GRAPHICS

Use the diagrams below to answer the questions that follow.



19. Which diagrams represent isotopes of the same element?

20. What is the atomic number for A?

21. What is the mass number for B?
