

Section Review

Development of the Atomic Theory

USING VOCABULARY

1. In your own words, write a definition for the term *atom*.

Correct each statement by replacing the underlined term.

2. The nucleus is a particle that has a negative electric charge.

3. The electron cloud is where most of an atom's mass is located.

UNDERSTANDING CONCEPTS

4. **Describing** What did Dalton do that Democritus did not do in developing his atomic theory?

5. **Identifying** What discovery demonstrated that atoms are mostly empty space?

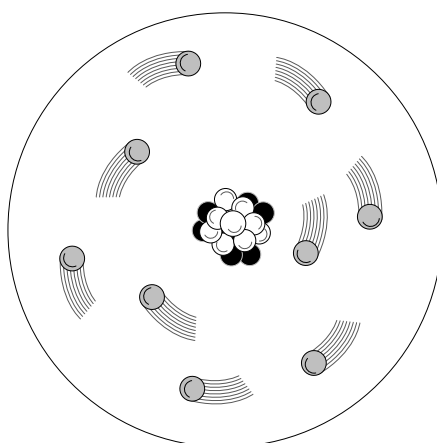
6. **Comparing** What refinements did Bohr make to Rutherford's proposed atomic theory?

Section Review *continued*

7. Evaluating What about Bohr's atomic theory was partially correct and was also refined by other scientists?

INTERPRETING GRAPHICS

Use the diagram below to answer the next question.



8. Identifying In the diagram above, label the electrons and nucleus. Identify the kind of charge on each.

CRITICAL THINKING

9. Making Comparisons Compare the location of electrons in an atom based on Bohr's theory with the location of electrons in an atom based on the current atomic theory.

Section Review *continued*

10. Analyzing Methods How does the design of Rutherford’s experiment show what he was trying to find out?

11. Analyzing Ideas Why are the parts of an atom that electrons occupy called *electron clouds*?

CHALLENGE

12. Forming Hypotheses Rutherford performed his gold-foil experiment to test Thomson’s plum-pudding model. Describe what the results of Rutherford’s experiment would have looked like if it had supported the plum-pudding model instead of contradicted it.

Section Review

The Atom

USING VOCABULARY

1. Use the following terms in the same sentence: *proton*, *neutron*, and *isotope*.

Complete each of the following sentences by choosing the correct term from the word bank.

atomic mass unit
mass number

atomic number
atomic mass

2. An atom's _____ is equal to the number of protons in the atom's nucleus.
3. The _____ of an element is equal to the weighted average of the masses of all the naturally occurring isotopes of that element.

UNDERSTANDING CONCEPTS

4. **Describing** Name and describe the four forces that are at work within the nucleus of an atom.

5. **Summarizing** Explain what an atom is composed of. Be sure to list specific properties of each of the particles in an atom.

Section Review *continued*

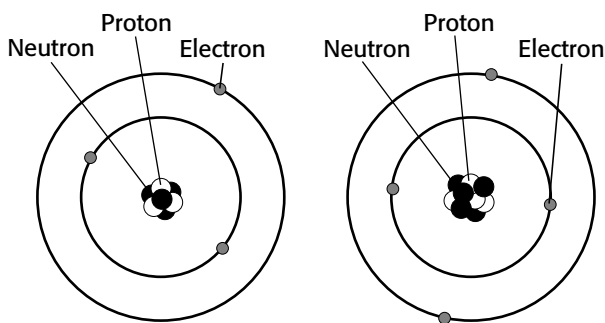
6. Analyzing Many elements have two or more isotopes. How do scientists tell the difference between two isotopes of the same element?

CRITICAL THINKING

7. Applying Concepts Could a nucleus that has more than one proton but no neutrons exist? Explain.

INTERPRETING GRAPHICS

Use the atomic diagrams below to answer the next two questions. Assume all of the particles in the nuclei of the atoms that are represented are visible.



8. Making Comparisons Without looking at the nuclei of the atoms represented above, can you determine whether the atoms are of the same element? Explain.

9. Predicting Consequences What would happen if one electron were removed from each of the atoms?

Section Review *continued*

CHALLENGE

10. Analyzing Relationships When the elements on the periodic table are arranged by increasing atomic number, the atomic mass generally increases as the atomic number increases. For some elements, however, the atomic mass of the element is lower than the atomic mass for the element that came before it. Explain how this could be possible.
