

**Note-taking  
Worksheet**

# Properties of Atoms and the Periodic Table

## Section 1 Structure of the Atom

- A. \_\_\_\_\_ are abbreviated in scientific shorthand—first letter or two of element's name
- B. \_\_\_\_\_—smallest piece of matter that still has the properties of the element
- \_\_\_\_\_ have electrical charge of 1+.
  - \_\_\_\_\_ do not have an electrical charge.
  - \_\_\_\_\_ have electrical charge of 1-.
  - Protons and neutrons are in the \_\_\_\_\_ of an atom; electrons surround the nucleus.
- C. Protons and neutrons are made up of smaller particles called \_\_\_\_\_.
- Quarks are studied by colliding accelerated charged particles with protons, which leave tracks in a \_\_\_\_\_.
  - Six quarks are known to exist; the sixth is called the \_\_\_\_\_ quark.
- D. Scientists use scaled-up \_\_\_\_\_ to represent atoms.
- Early models of atoms used a solid \_\_\_\_\_.
  - Current \_\_\_\_\_ model shows electrons traveling in specific energy levels around a nucleus of protons and neutrons.

## Section 2 Masses of Atoms

- A. \_\_\_\_\_—composed mostly of the protons and neutrons in the nucleus
- Unit of measurement for atomic particles is \_\_\_\_\_ (amu) which is one-twelfth the mass of a carbon atom containing six protons and six neutrons.
  - \_\_\_\_\_—the number of protons in an atom; number of protons also identifies the element
  - The sum of the number of protons and neutrons in the nucleus of an atom is the \_\_\_\_\_.
- B. \_\_\_\_\_—atoms of the same element with different numbers of neutrons
- Different isotopes have different \_\_\_\_\_.
  - Number of \_\_\_\_\_ is equal to mass number minus atomic number.
  - Name of \_\_\_\_\_ followed by mass number identifies the isotope.
  - \_\_\_\_\_ is the weighted-average mass of an element's isotopes.
  - Average atomic mass is closest to its most \_\_\_\_\_ isotope.

**Note-taking Worksheet** (continued)**Section 3 The Periodic Table**

- A. Elements are organized in the \_\_\_\_\_ by increasing atomic number.
1. In the late 1800's, Dmitri Medeleev devised the first periodic table based on \_\_\_\_\_.
  2. In 1913, Henry G. J. Moseley arranged the elements by \_\_\_\_\_ rather than atomic mass.
- B. Vertical columns in the periodic table are \_\_\_\_\_ of elements with similar properties.
1. Elements in the same group have the same number of \_\_\_\_\_ in their outer energy level.
  2. Each of the seven energy levels can have a \_\_\_\_\_ number of electrons.
    - a. Energy level one can contain at most \_\_\_\_\_ electrons.
    - b. Energy level two can contain at most \_\_\_\_\_ electrons.
  3. Each row in the periodic table ends when an outer energy level is \_\_\_\_\_.
  4. \_\_\_\_\_ use the element symbol and dots to represent outer energy level electrons.
- C. \_\_\_\_\_—horizontal rows of elements that contain increasing numbers of protons and electrons.
1. Elements are \_\_\_\_\_ as metals, nonmetals, or metalloids (semimetals).
  2. Elements are \_\_\_\_\_ in laboratories all over the world.
- D. The \_\_\_\_\_ elements exist all over the universe.
1. Hydrogen and helium are the \_\_\_\_\_ of other naturally occurring elements.
  2. \_\_\_\_\_ spread heavier elements throughout the universe.