

Key!

Atom Notes

Physical Sci #4

Element- pure substance that cannot be separated into simpler substances by physical or chemical means. Represented by a chemical symbol

Atom – Smallest particle into which an element can be divided and still be the same substance.

Accepted scientific theory of atoms:

- ▶ 1. All substances are made of atoms.
- ▶ 2. Atoms are small particles that cannot be created or destroyed.
- ▶ 3. Atoms of the same element are exactly alike.
- ▶ 4. Atoms join with other atoms to make new substances

AMU stands for Atomic Mass Unit, the unit used to measure the mass of protons and neutrons.

Atoms are composed of three primary subatomic particles:

1. Protons

- ▶ **positively** charged particles
- ▶ found in the **nucleus**
- ▶ mass is 1 AMU

2. Neutrons

- ▶ **no charge (neutral)**
- ▶ found in the **nucleus**
- ▶ mass is 1 AMU
- ▶ “glue” that holds the protons together in the nucleus.

3. Electrons

- ▶ **Negatively** charged
- ▶ Found **around the nucleus** in energy levels within the electron cloud.
- ▶ **Mass** is very small, **almost zero**

Atoms are neutral because the number of protons equals the number of electrons.

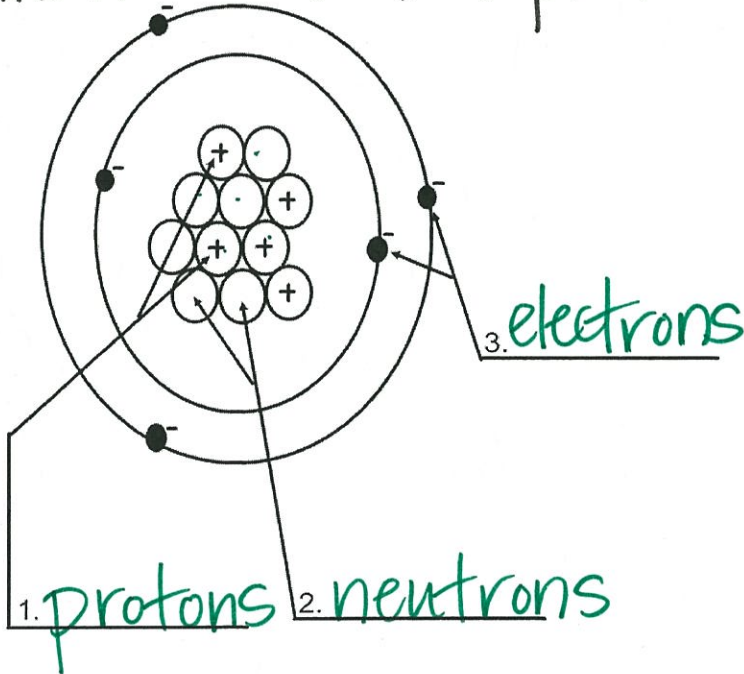
All of the **mass** of an atom is found in the nucleus.
Almost all of the **volume** of an atom is empty space.

of protons = # of electrons

Atomic Structure Worksheet

Label the parts of an atom on the diagram below.

Atomic number = # of protons



4. What type of charge does a proton have?

positive

5. What type of charge does a neutron have?

neutral

6. What type of charge does an electron have?

negative

7. Which two subatomic particles are located in the nucleus of an atom?

protons & neutrons

8. If an atom has 35 protons in the nucleus, how many electrons will it have orbiting the nucleus?

35 electrons

9. What is the atomic number of the atom in the diagram above?

10. What is the atomic mass/mass number of the atom in the diagram above?

11 amu

11. How many protons are in the nucleus of an atom with an atomic number of 15?

15

12. How many electrons are in the nucleus of an atom with an atomic number of 20?

20

13. How many neutrons are in the nucleus of an atom with an atomic number of 25? (use Periodic Table for mass)

14. What is the mass number of an atom with 3 protons, 4 neutrons, and 3 electrons?

15. How many neutrons are in the nucleus of an atom that has an atomic mass of 36 and an atomic number of 25?

Name: _____

Block: _____

Atomic Structure Worksheet

1. The 3 particles of the atom are:

- a. protons
- b. neutrons
- c. electrons

Their respective charges are:

- a. positive
- b. neutral
- c. negative

2. The number of protons in one atom of an element determines the atom's _____, and the number of electrons determines _____ of an element.

3. The atomic number tells you the number of protons in one atom of an element. It also tells you the number of electrons in a neutral atom of that element. The atomic number gives the "identity" of an element as well as its location on the Periodic Table. No two different elements will have the _____ atomic number.

4. The _____ of an element is the average mass of an element's naturally occurring atom, or isotopes, taking into account the _____ of each isotope.

5. The _____ of an element is the total number of protons and neutrons in the _____ of the atom.

6. The mass number is used to calculate the number of _____ in one atom of an element. In order to calculate the number of neutrons you must subtract the _____ from the _____.

