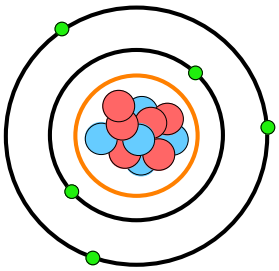
CONCEPT: ISOTOPES

- **Isotopes** are elements with the _____ number of protons, but _____ number of neutrons.
  - □ **Atomic Number (Z)**: Provides the number of _____.
    - □ Determines the _____ and chemical properties of an element.
  - □ **Mass Number (A):** Provides the number of _____ + _____.
    - □ To calculate the number of neutrons: _____ number (___) – _____ number (___).

Atomic View



Number of neutrons (n^0) = _____ Mass Number (A) = _____

Number of protons (p^+) = _____ Atomic Number (Z) = _____

Number of electrons (e^-) = _____ Element Identity = _____

- For a neutral element, which is often called an atom, the number of _____ and _____ are equal.

Isotope Notation

- The representation for an isotope includes its atomic number (___), mass number (___) and element symbol (___).

$$ {}^{A}_{Z}X $$

EXAMPLE: Calcium-43 represents one of the isotopes for the calcium atom. If the number 43 represents its mass number, determine the correct numbers for its subatomic particles.

a) 20 protons, 43 neutrons and 20 electrons

b) 43 protons, 20 neutrons and 43 electrons

c) 63 protons, 23 neutrons and 63 electrons

d) 20 protons, 23 neutrons and 20 electrons

$$ {}^{43}_{20}Ca $$

CONCEPT: ISOTOPES

PRACTICE: Which of the following answers give the correct number of subatomic particles for $^{88}_{38}Sr$?

a) 38 protons, 38 neutrons and 1338 electrons

b) 88 protons, 50 neutrons and 50 electrons

c) 38 protons, 50 neutrons and 38 electrons

d) 38 protons, 27 neutrons and 13 electrons

PRACTICE: Which of the following answers give the correct number of subatomic particles for $^{34}_{16}S$?

a) 34 protons, 34 neutrons and 34 electrons

b) 50 protons, 18 neutrons and 18 electrons

c) 16 protons, 18 neutrons and 16 electrons

d) 17 protons, 17 neutrons and 17 electrons

PRACTICE: Fill in the gaps for the following table of atoms.

Isotope	Mass Number	Atomic Number	Neutrons	Protons	Electrons
Zirconium-94			54	40	
		33	42		
Aluminum-27	27			13	
	59	27			