

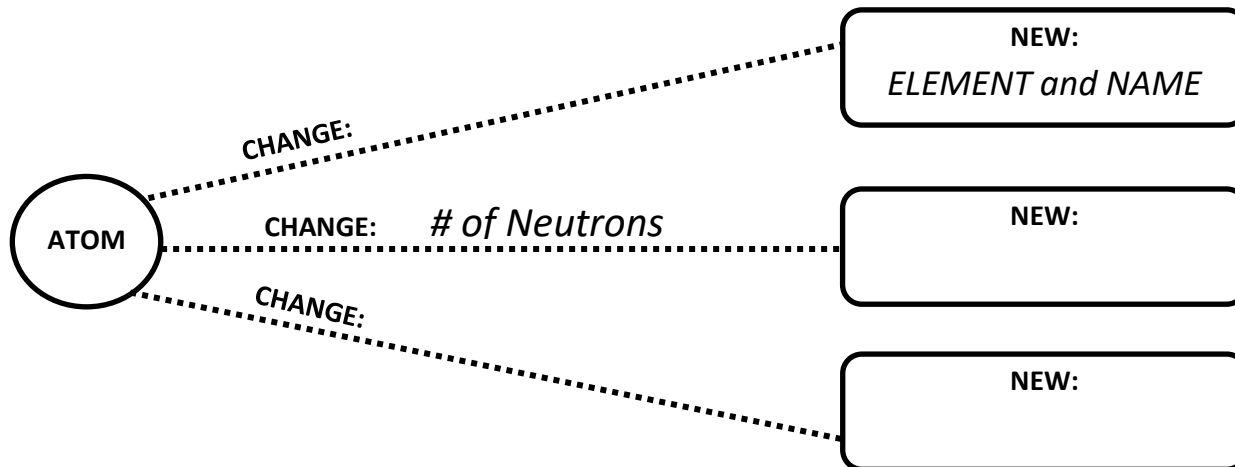
Worksheet #2

Name: _____

Period: _____

Seat#: _____

Pre-activity Graphic – Fill out the missing parts of the following graphic that explains the difference between elements, isotopes and ions.



In Class Activity

Isotopes:

- 1) At the lab benches are bags labeled A-R. Each bag contains various amounts of black and blue marbles. The black marbles represent protons, the blue marbles represent neutrons.
- 2) For each bag, record the bag letter, number of protons and number of neutrons in the Data Table.
- 3) Using these values and the periodic table, deduce the information needed to complete the Data Table.

| Bag | # of Protons | # of Neutrons | Mass # | Isotope Name |
|-----|--------------|---------------|--------|--------------|
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Ions:

- 1) At the lab benches are other bags filled with beans and popcorn kernels. The white beans represent protons, the black beans represent neutrons, and the popcorn kernels represent electrons.
- 2) For each bag, record the bag number, number of protons and neutron and electrons in the Data Table.
- 3) Using these values and the periodic table, deduce the information needed to complete the Data Table.

| Bag # | # Protons | # Neutrons | # Electrons | Mass # | Ion Symbol | Isotope Name |
|-------|-----------|------------|-------------|--------|------------|--------------|
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Post-activity Reading - Read and “mark-up” the following reading.**Circle key terms, underline important facts/statements/claims**

In chemical reactions, atoms tend to gain or lose their electrons. If an atom loses or gains electrons and now has an unequal number of protons and electrons, it is called an *ion*. If an atom contains 17 p⁺, 18 n⁰, and 18 e⁻ then the atom is a chloride ion because it has an atomic number of 17, but does not have 17 electrons.

Ions are written using the element symbol, with the net number of electrons gained or lost at the top and right corner of the symbol. If the ion has lost electrons, a + sign is put after the number, if the ion has gained electrons a – sign is used. If the ion has lost or gained only one electron, the number 1 is omitted from the ion symbol. The chloride ion, with one extra electron is written Cl⁻

If an atom has 20 p⁺ and 18 e⁻ then the atom has lost two electrons, then the ion is a calcium atom (atomic number 20) and the electrical charge is 2+ (20protons – 18 electrons = 2+). The ion is written as Ca²⁺

Post-activity Isotope Questions – Complete the following chart filling in any missing information.

| Element Name | Atomic # | # Protons | # Neutrons | # Electrons | Mass # |
|----------------|----------|-----------|------------|-------------|--------|
| 1) Carbon - | | | | | 12 |
| 2) | 8 | | 8 | | |
| 3) Hydrogen - | | | | | 1 |
| 4) | | 6 | | | 14 |
| 5) Hydrogen - | | | 2 | | |
| 6) Nitrogen - | | | | | 14 |
| 7) | | | 1 | | 2 |
| 8) | 92 | | 146 | | |
| 9) Cesium - | | | 82 | | |
| 10) | 11 | | 12 | | |
| 11) | | 47 | | | 108 |
| 12) Tungsten - | | | 110 | | |
| 13) | | | 45 | | 80 |
| 14) | | 24 | | | 52 |
| 15) | | | 89 | | 152 |
| 16) Silver - | | | | | 107 |
| 17) | 76 | | 114 | | |

Post-activity Ion Questions - Write the ion symbols given the following information

| | | |
|--|--|---|
| 18) 23 protons, 27 neutrons and 19 electrons. | 19) 37 protons, 48 neutrons, and 36 electrons | 22) How many protons, neutrons and electrons does the following have? Sb ³⁻ Protons: Neutrons: Electrons: |
| 20) 5 protons, 6 neutrons, and 2 electrons | 21) 16 protons, 16 neutrons, and 18 electrons | |