WEDNESDAY, OCT. 15

1. The mass number of the atom is the total number of _____ & _____.

2. What are the three particles in an atom and what is each of their charges?

3. The symbol for elements is commonly written like the example shown to the right. $^{16}_{8}O$

a. What does the 16 represent?

_____

b. What does the 8 represent?

_____

c. What is the name of the element?

_____

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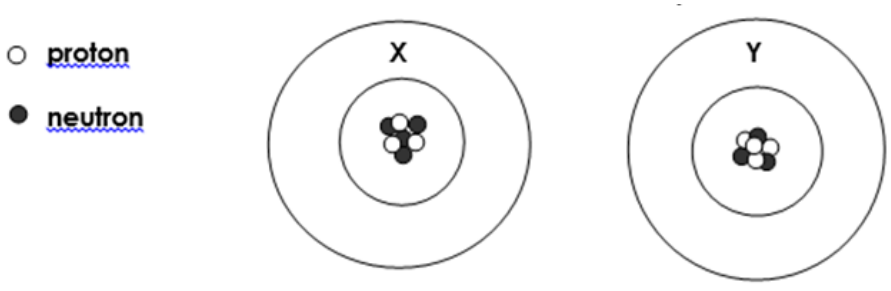
4. Write the appropriate symbol (like the one above with numbers) for **aluminum**. _____

5. Use the Diagram Below to Answer the Following Questions:



a. Which element is represented in element X? _____

b. Which element is represented in element Y? _____

c. Which element (if any) has the greater mass number? _____

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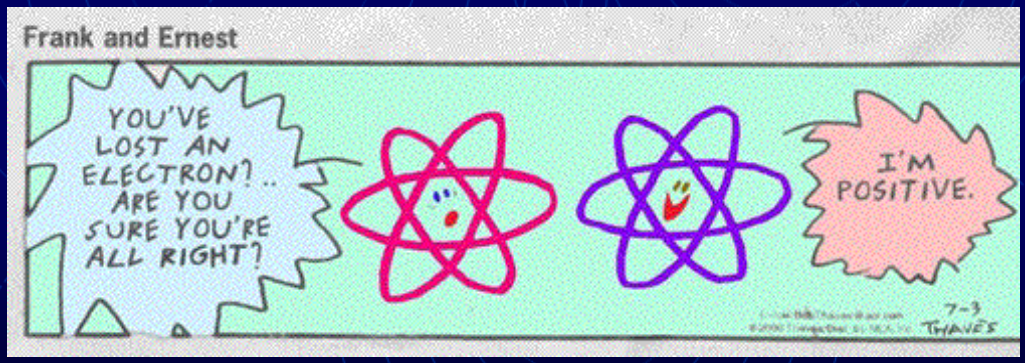
Atoms, Ions, and Isotopes



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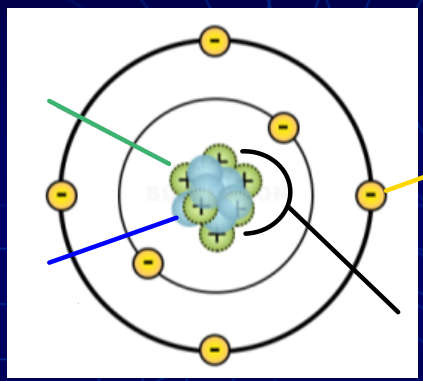
Quick Review

- Atoms are made up of three particles:

PUSH



neutron
proton
nucleus
electron

- Which of the three particles identifies what element an atom is?

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Review

Proton

- Most of an atom's mass is contained in the **nucleus**
- Check out the comparison chart below:

PARTICLE	SYMBOL	MASS	RELATIVE MASS
Proton	p+	1.67×10^{-27} kg	1 amu
Neutron	n^0	1.67×10^{-27} kg	1 amu
Electron	e-	9.11×10^{-31} kg	1/1840 amu

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Different Forms of the Same Element

- In any element, the # of **protons** is always **constant**
- Number of **electrons and neutrons** can vary within an element without changing the **identity** of the element
  - > Ex. Carbon (C) ALWAYS has **6 protons**, but it can have **6-8 neutrons** and **2-10 electrons**
- **Mass Number** can change also
  - > Mass Number = Protons + Neutrons

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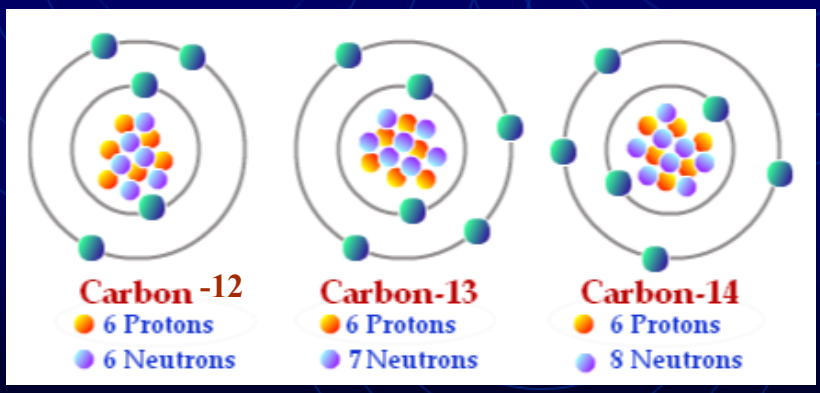
Isotopes

- An **ISOTOPE** is a form of an element that has a different number of neutrons than "normal"
- Carbon has three isotopes: **Carbon-12, Carbon-13, Carbon-14**



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Protons and Neutrons

Instructions

Below you will practice figuring out the different protons, electrons, and neutrons for the table. I have left some open to help you out, but once you have an answer click on the cell shade to reveal the answers. If you need the periodic table click on the animal below to go to the periodic table.

Isotope	Number of p+	Number of e-	Number of n0	Nuclear Symbol
Hydrogen-2			1	
Helium-3	2			
Lithium-7				$^{7}_{3}Li$
Beryllium-9		4		
Boron-11				

Previous Next

Protons and Neutrons

IONS

- An atom usually has a [redacted] charge
- That means it has the same number of [redacted] as [redacted]
  - Remember, a proton has a positive charge and an electron has a negative charge
- [redacted] – an atom that has [redacted] one or more [redacted] and has become charged either positively or negatively

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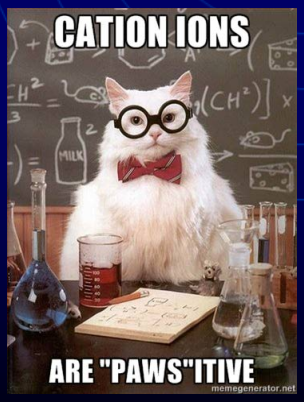
Positive Ions: "CATIONS"

- When an atom **LOSES** electrons, it becomes more **POSITIVE**



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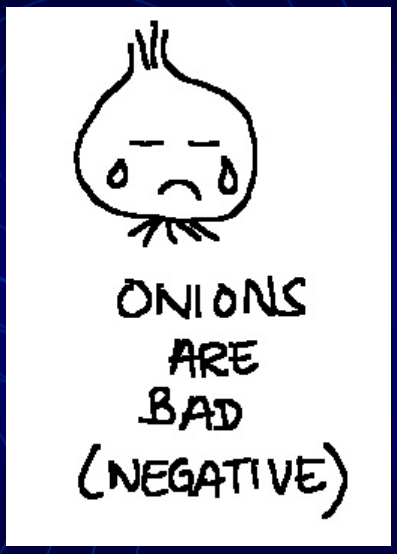
Negative Ions: "ANIONS"

- When an atom **GAINS** electrons it becomes more **NEGATIVE**

WHY?



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Representing Ions

- Ions are represented by placing a charge number next to the atomic symbol
- Examples
  - > O^{-2} = oxygen with a negative 2 charge
  - > K^{+} = potassium with a positive 1 charge
  - > N^{-3} = nitrogen with a negative 3 charge

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Isotopes

EXAMPLE 1:

1. Neutral Sodium (Na) atoms have ____ protons and ____electrons with a net charge of _____.

2. If the Sodium ion gives one electron away, what is the net charge of the ion? _____.

3. What is the chemical symbol for this ion?

_____

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EXAMPLE 2:

1. Neutral Chlorine (Cl) atoms have ____ protons and ____electrons with a net charge of ____.

2. If the Chlorine ion gets one extra electron, what is the net charge of the ion? _____.

3. What is the chemical symbol for this ion?

_____

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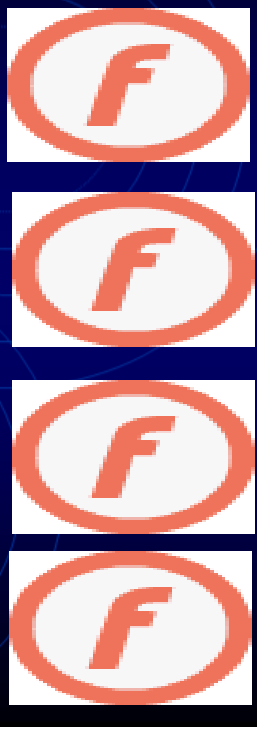
Identify the following as either Ions or Isotopes of each other



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Assignment Instructions

- Drag and drop the appropriate amount of subatomic particles to create the assigned atom. Be sure to note the charge of the atom.
- Do not press "restart" when done. Proceed to the next slide and create that atom.

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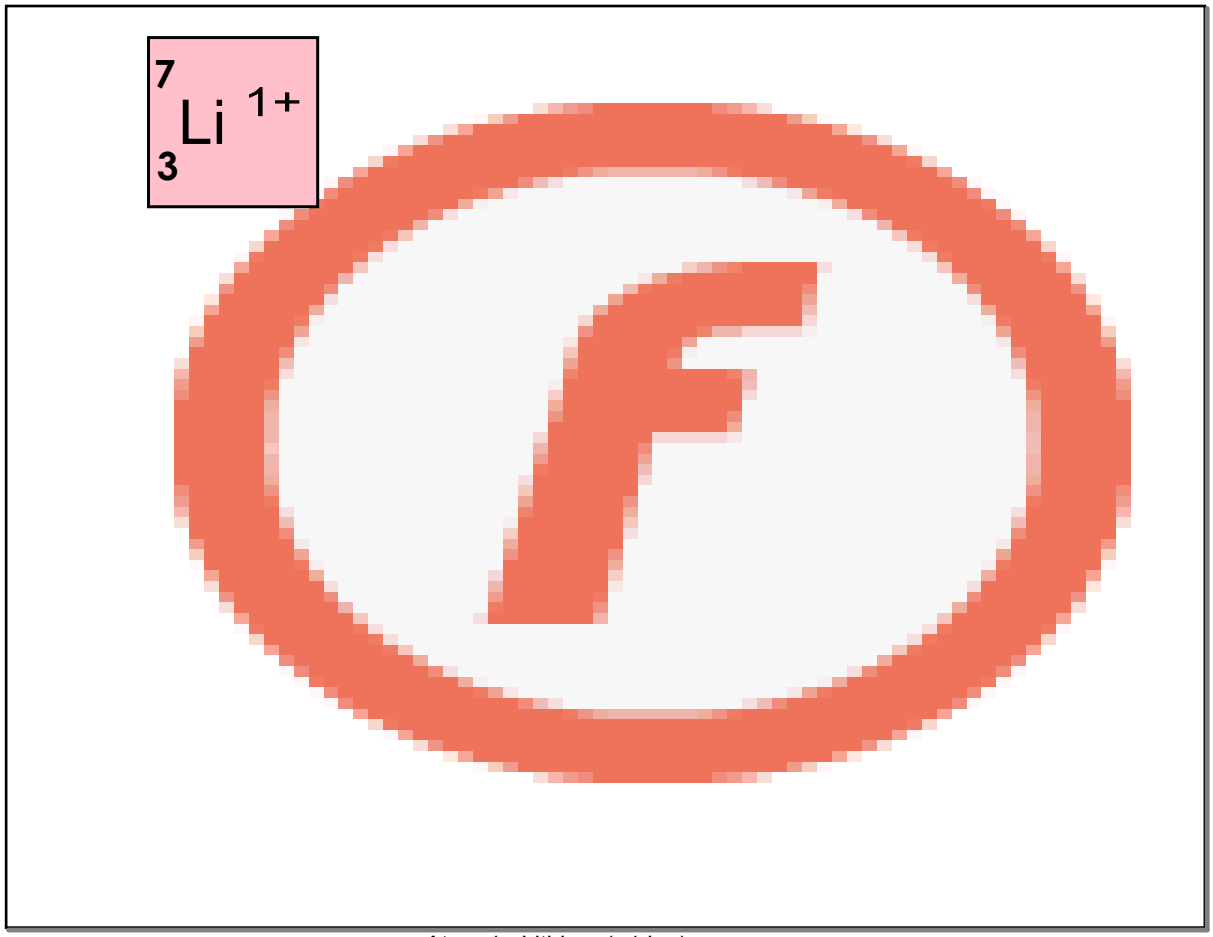
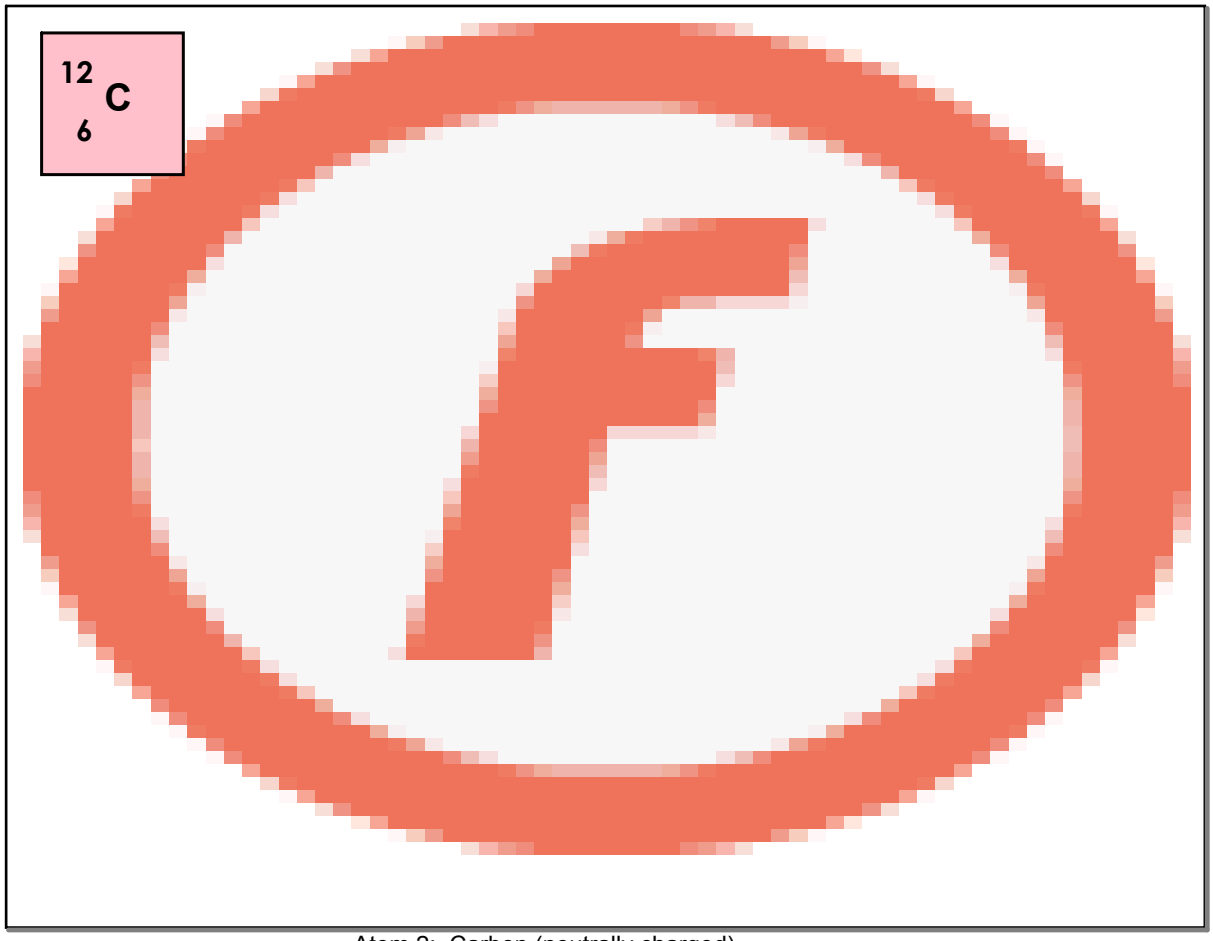
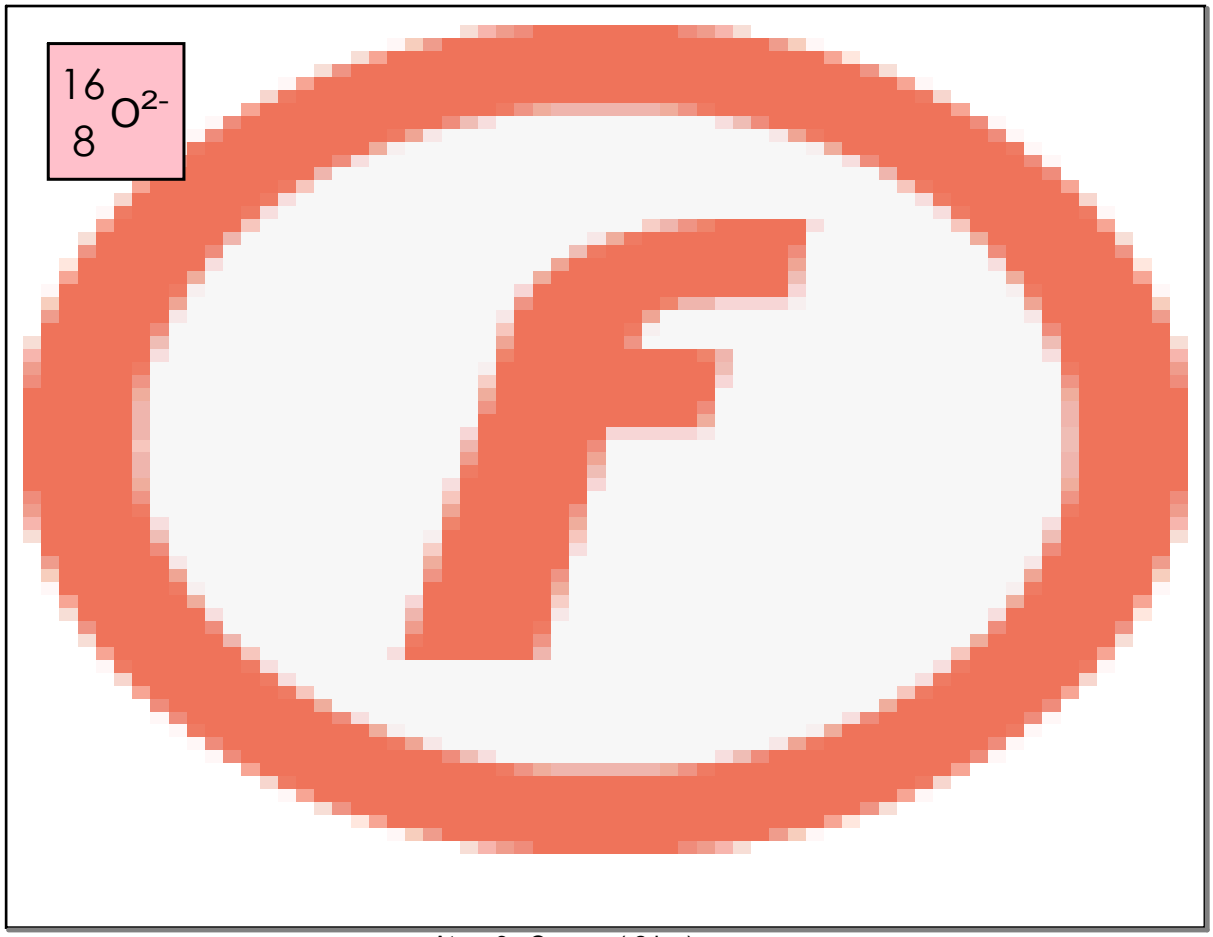


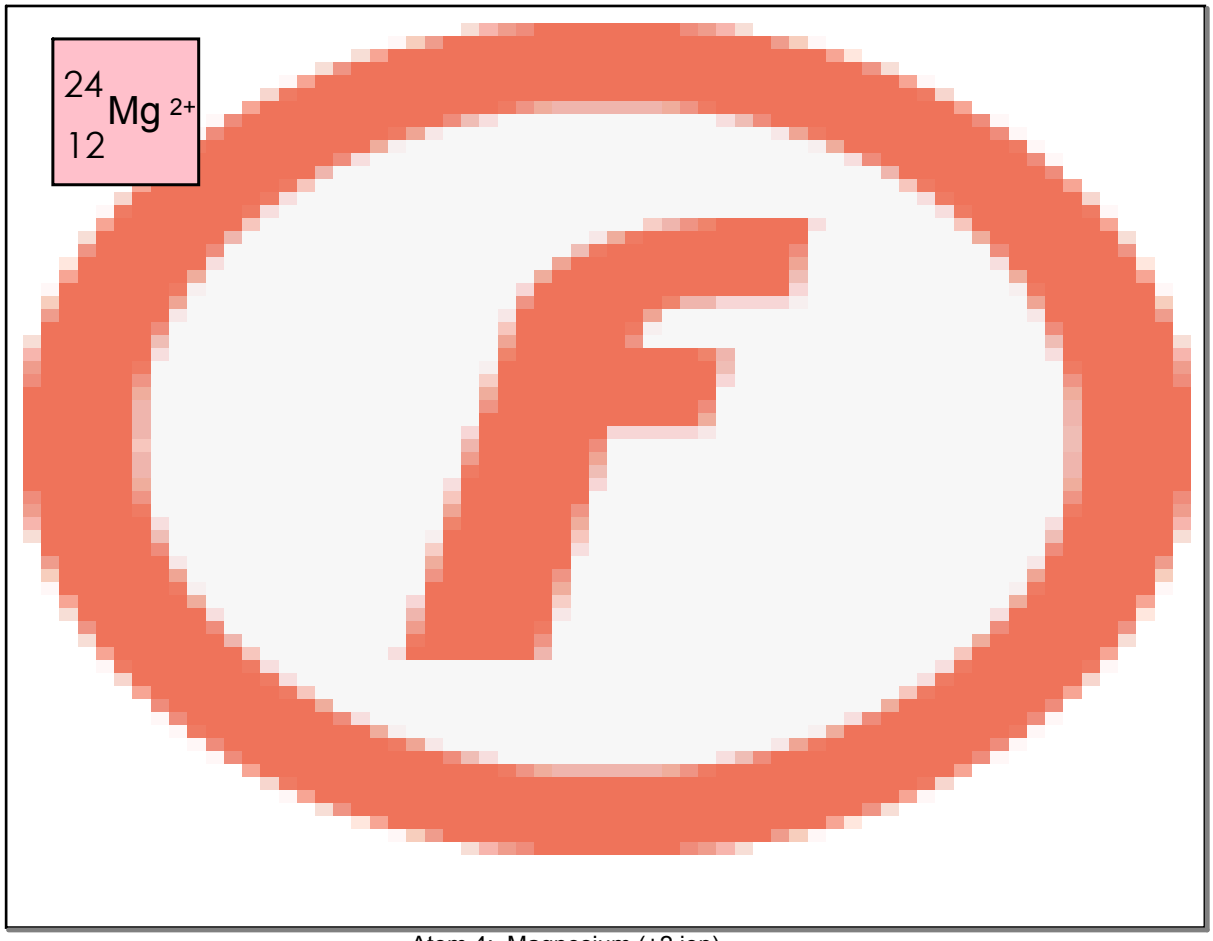
Atom 1: Lithium (+1 ion)



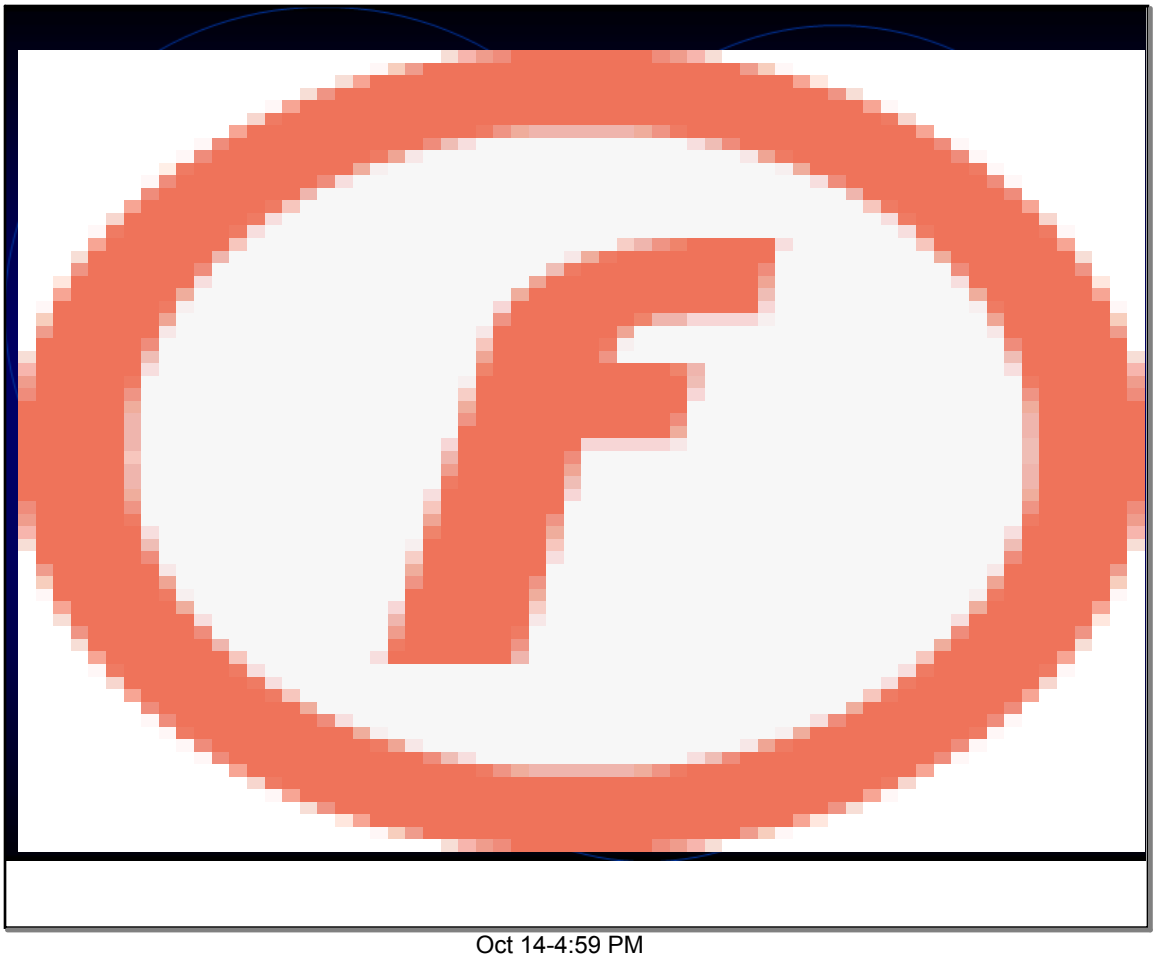
Atom 2: Carbon (neutrally charged)



Atom 3: Oxygen (-2 ion)



Atom 4: Magnesium (+2 ion)



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