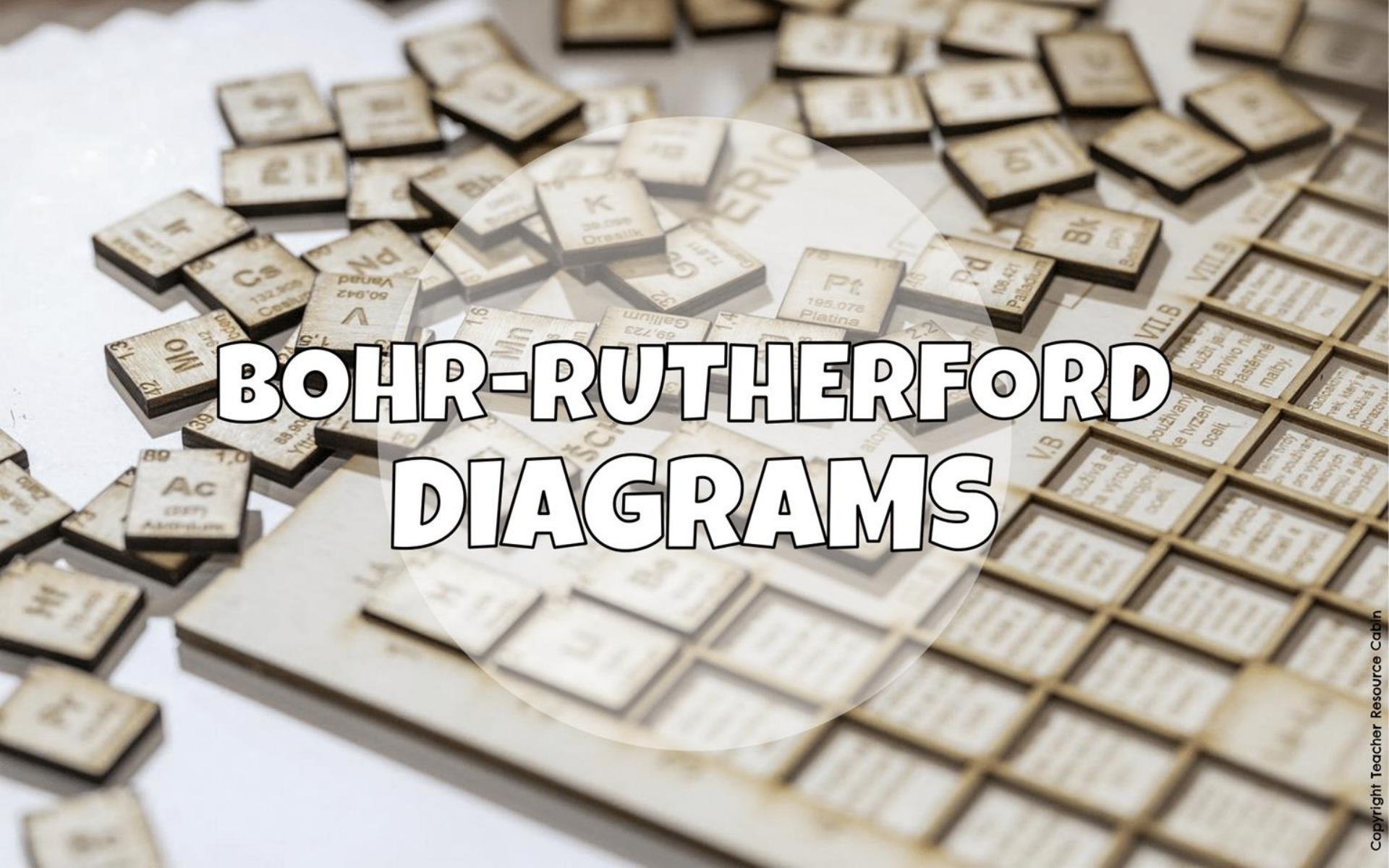
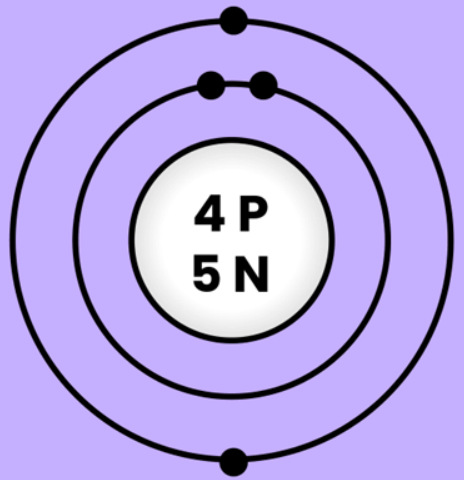


BOHR-RUTHERFORD DIAGRAMS

- Bohr-Rutherford diagrams are atomic models that are used to display the number of electrons in each shell of an atom.

- The nucleus is at the centre of the model. Inside the nucleus are the atom's protons and neutrons.

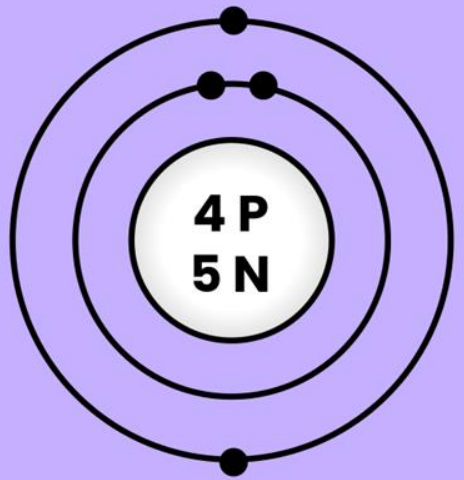


P = Protons

N = Neutrons

BOHR-RUTHERFORD DIAGRAMS

- Remember, the atomic number shows the number of protons an atom has.
    - You can find the average number of neutrons of an element by subtracting the atomic number from the atomic mass.



The electrons orbit the atom

BOHR-RUTHERFORD DIAGRAMS

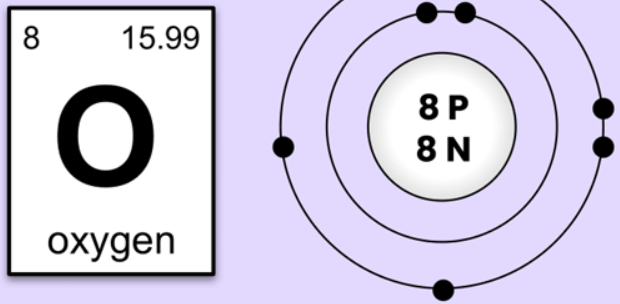
- The electrons of an atom **orbit** the nucleus.
  - They are shown on the outer rings of the model, called shells.
- Each shell can only hold a certain number of electrons.
  - These limits are shown in the table on the right.

Shell number	Electron limit
1	2
2	8
3	18
4	32

Think about it!

Write the number of protons, electrons and neutrons for each diagram below.

1. Bohr-Rutherford model of **oxygen** atom

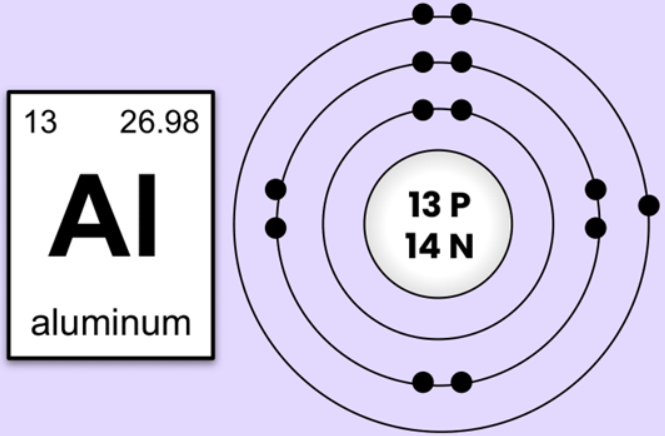


Protons: _____

Neutrons: _____

Electrons: _____

2. Bohr-Rutherford model of **aluminum** atom



Protons: _____

Neutrons: _____

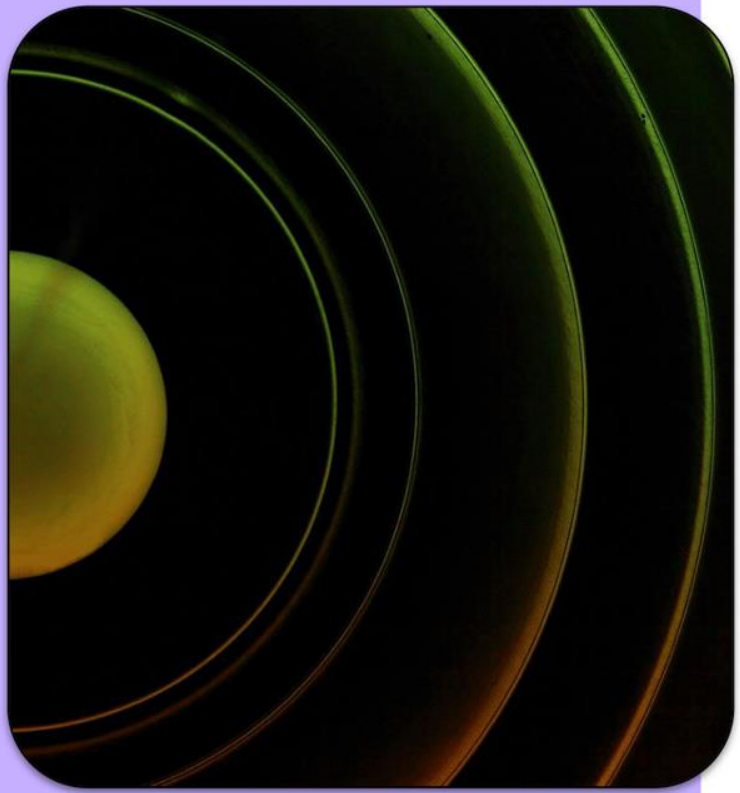
Electrons: _____

Think about it!

Practice drawing a Bohr-Rutherford model for each element. You can use paper or the shapes tool on Google Slides™.

3	15	9
6.94	30.973	18.99
Li	**P**	**F**
lithium	phosphorus	fluorine

BOHR-RUTHERFORD DIAGRAMS



- In some cases, isotopes exist for certain elements.

- An isotope is two or more forms of the same element that contain equal numbers of protons but different numbers of neutrons.

BOHR-RUTHERFORD DIAGRAMS

Carbon 12
Protons: 6
Neutrons: 6

Carbon 13
Protons: 6
Neutrons: 7

Carbon 14
Protons: 6
Neutrons: 8

Example:

- Carbon has three different isotopes.
- In most cases, carbon has 6 protons and 6 neutrons.
  - This is known as carbon 12.
- However, carbon 13 has 7 neutrons, and carbon 14 has 8 neutrons.

? ? ?

Would isotopes have different atomic numbers or different atomic masses?