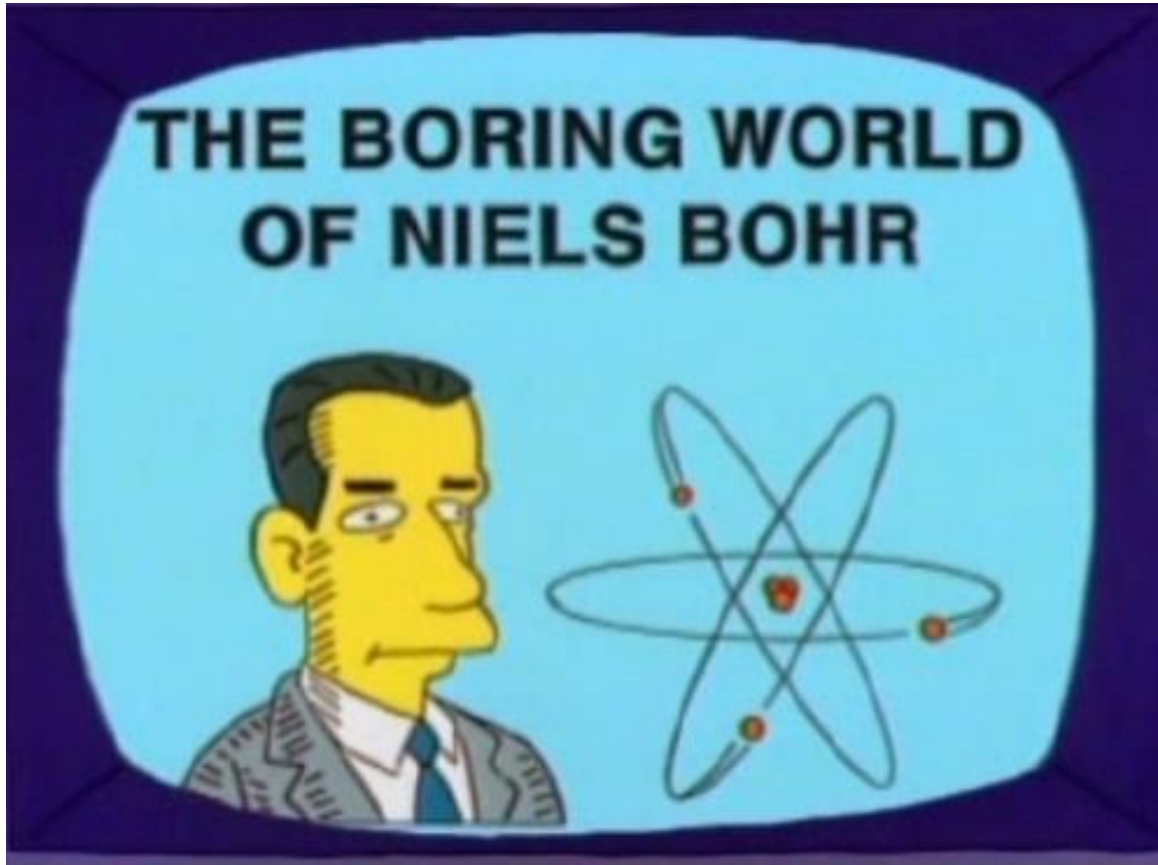


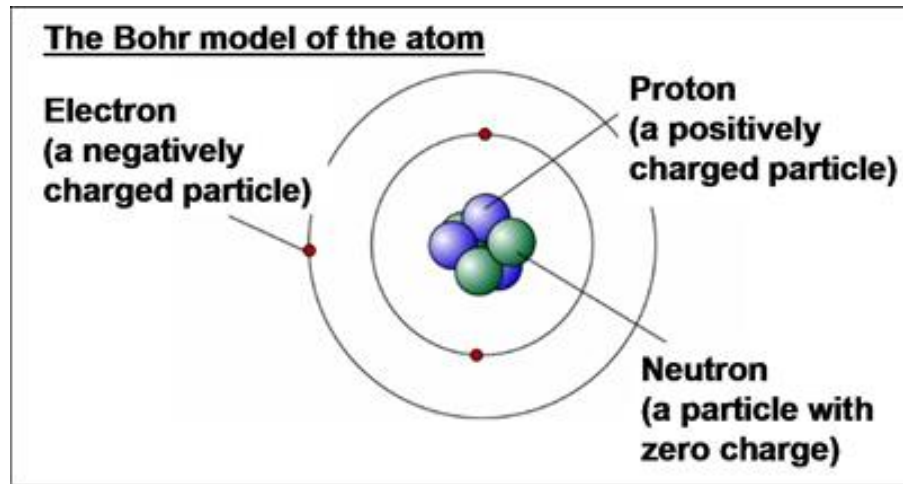
# Bohr Diagrams



S1-2-05 Assemble or draw Bohr atomic models for the first 18 elements and group them according to the number of outer shell electrons.

# Bohr Diagrams...

Recall that Bohr put the **ELECTRONS** into **ORBITALS** which are like **CIRCLES** around the **NUCLEUS**.



Each **ORBIT** (**SHELL** or **ENERGY LEVEL**) can hold a specific amount of **ELECTRONS**:

**First Shell** → *Maximum of 2 electrons*

**Second Shell** → *Maximum of 8 electrons*

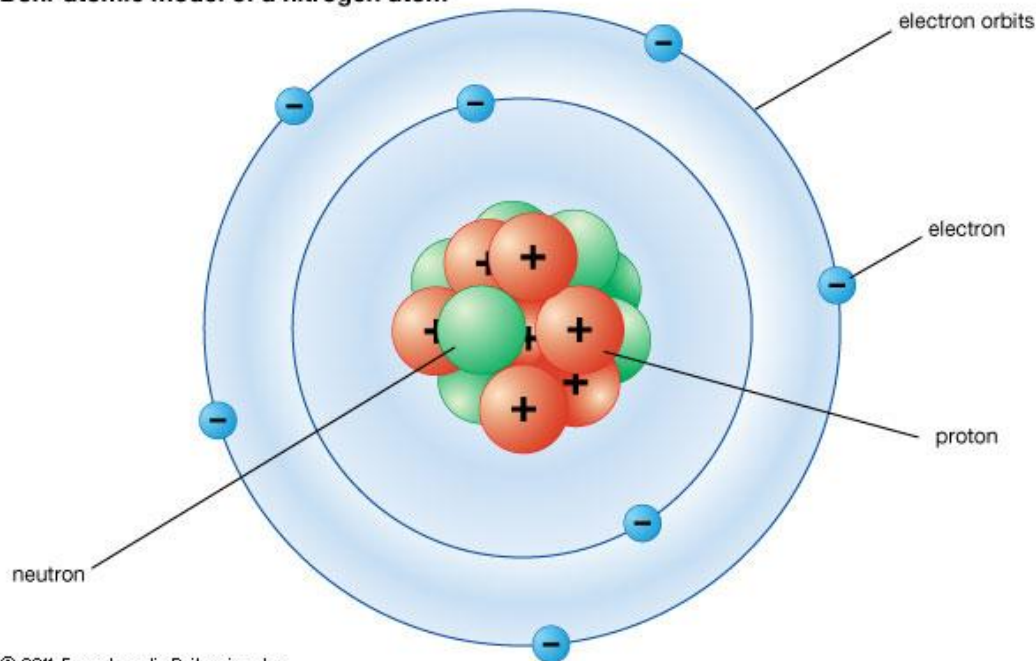
**Third Shell** → *Maximum of 8 electrons*

# Bohr Diagrams...

To show the electronic structure of atoms, we use **BOHR DIAGRAMS**, which are drawings that show:

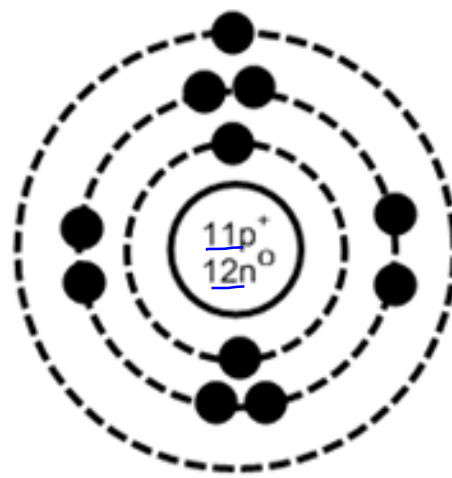
- the arrangement of **ELECTRONS OUTSIDE** the **NUCLEUS**
- number of **PROTONS** and **NEUTRONS** in the **NUCLEUS**.
- The number of **VALENCE ELECTRONS**  
→ The electrons in the **OUTERMOST SHELL**

Bohr atomic model of a nitrogen atom



# Bohr Diagrams...

Here is the Bohr diagram for sodium:



Looking at the above example, come up with a set of rules for drawing Bohr diagrams:

## Rules for Drawing Bohr Diagrams

- $e^-$  in orbits - drawn as dots (circles)
- $p^+$ ,  $n^0$  in nucleus (say how many)
- nucleus is solid line, orbits are dotted lines
- $e^-$  are paired in 2nd, 3rd orbits
- $2e^-$  in 1<sup>st</sup>, 8 in 2nd, 8 in third
- fill lower shells first

# Bohr Diagrams...

## Examples:

Using our set of rules, draw a Bohr diagram for each of the following:

### 1. Hydrogen

# 1  
mass = 1

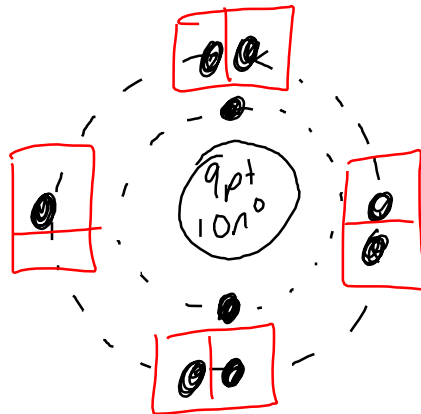
1p<sup>+</sup>  
1e<sup>-</sup>  
0n<sup>0</sup>



### 2. Fluorine

# 9  
mass 19

9p<sup>+</sup>  
9e<sup>-</sup>  
10n<sup>0</sup>



# Try these ones...

Draw a Bohr diagram for:

## 1. Phosphorus

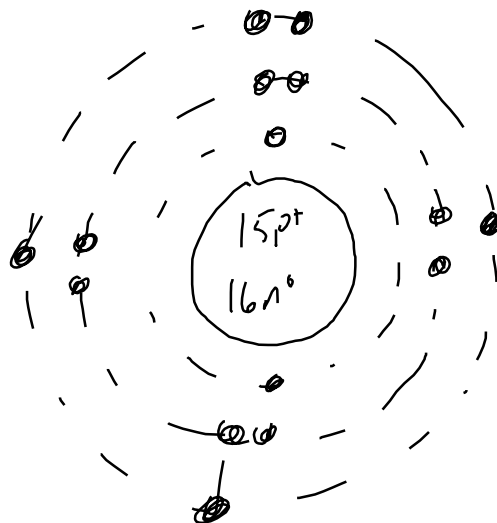
#15

mass = 31

15p<sup>+</sup>

15e<sup>-</sup>

16n<sup>0</sup>



## 2. Carbon

#6

mass = 12

6p<sup>+</sup>

6e<sup>-</sup>

6n<sup>0</sup>



## 3. Helium

#2

mass = 4

2p<sup>+</sup>

2e<sup>-</sup>

2n<sup>0</sup>

