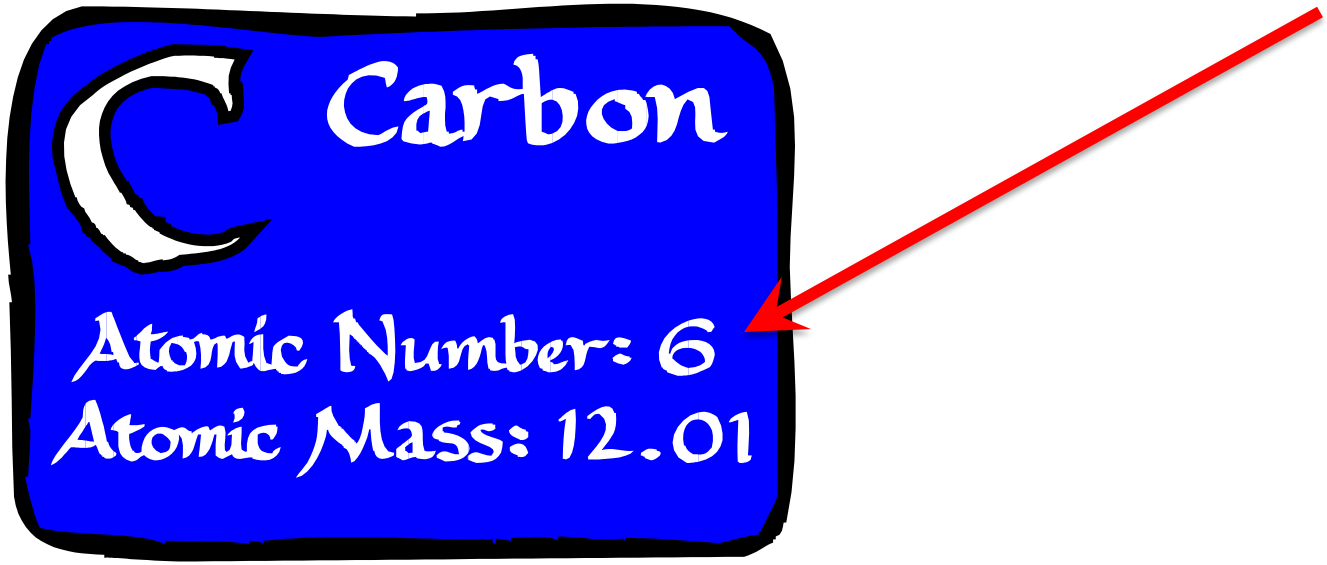
Atomic Modeling

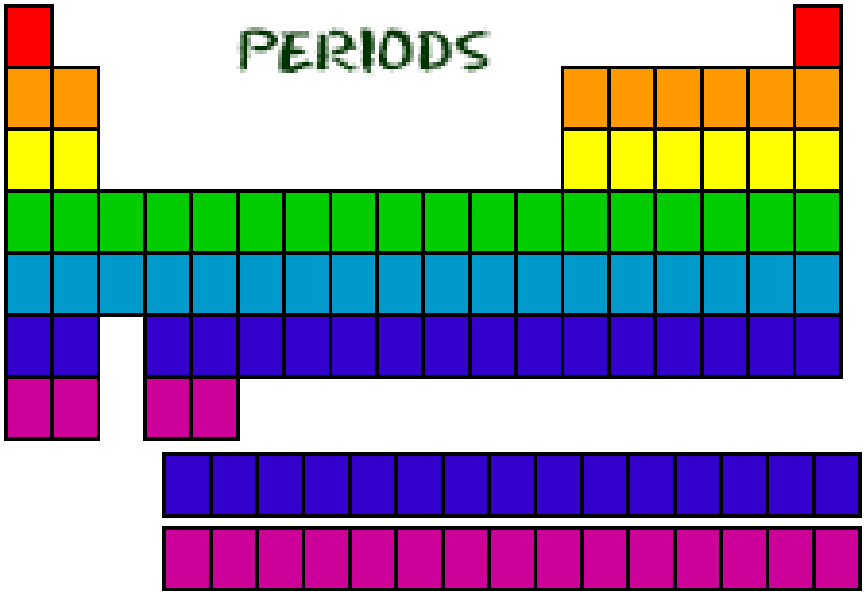
Bohr Models
&
Electron Dot Diagrams

Bohr Diagrams

1) Find your element on the periodic table.
2) Determine the number of electrons – it is the same as the atomic number.
3) This is how many electrons you will draw.



Bohr Diagrams



- Find out which period (row) your element is in.
- Elements in the **1st period** have one energy level.
- Elements in the **2nd period** have two energy levels, and so on.

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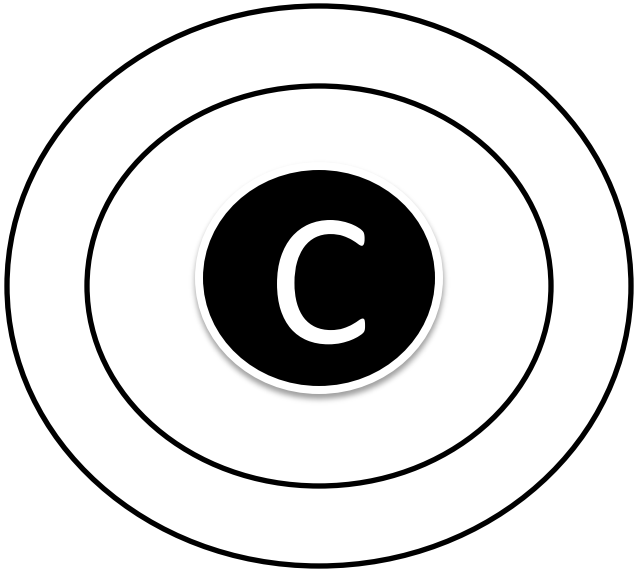
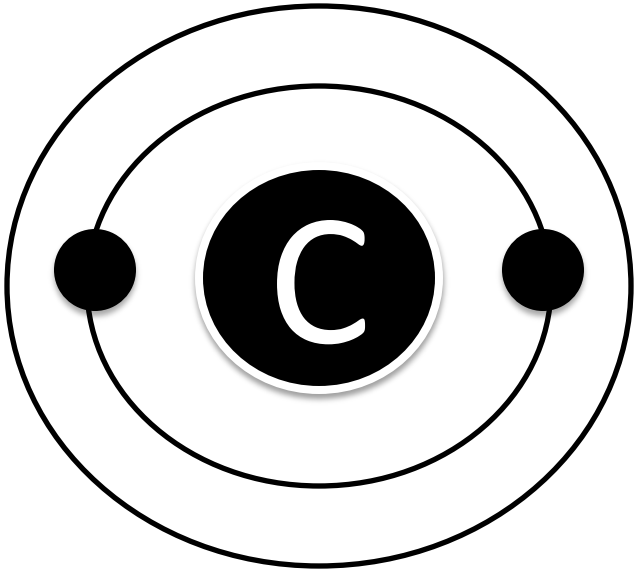
Bohr Diagrams



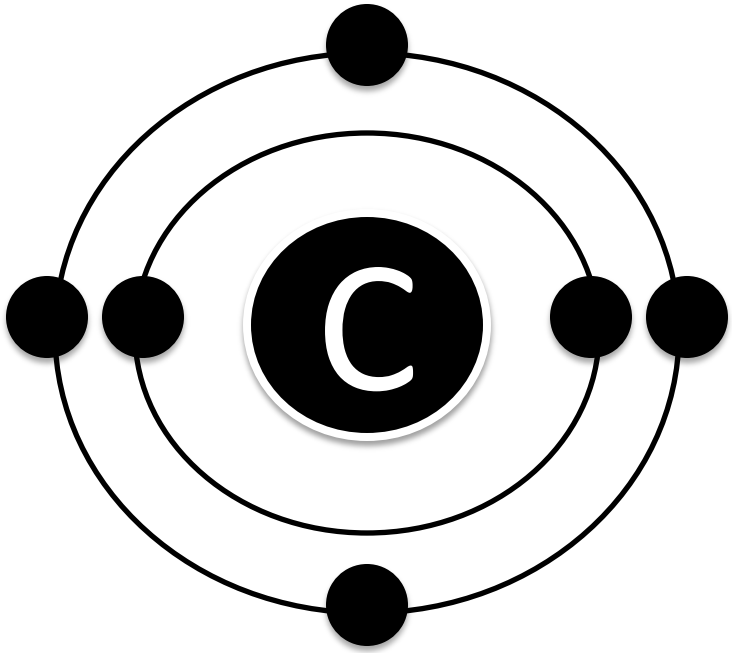
1) Draw a nucleus with the element symbol inside.
2) Carbon is in the 2nd period, so it has two energy levels, or shells.
3) Draw the shells around the nucleus.

Bohr Diagrams



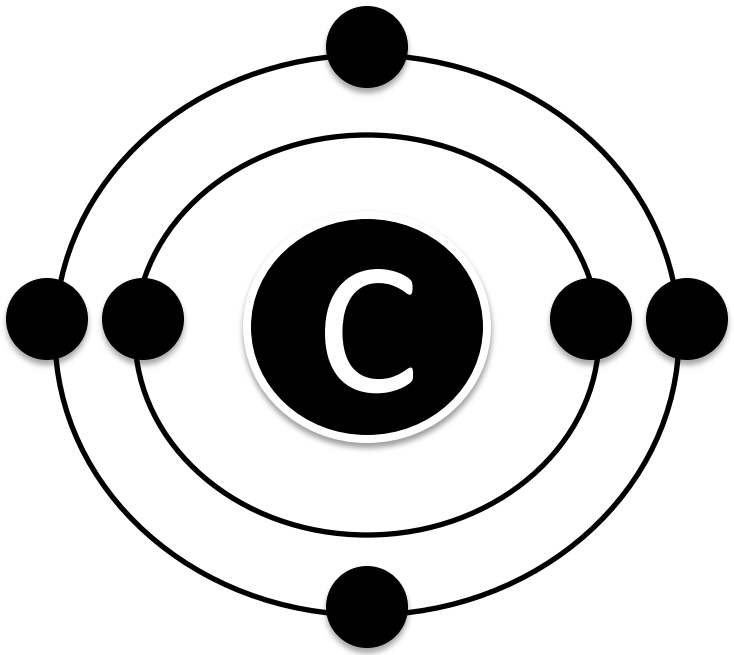
1) Add the electrons.
2) Carbon has 6 electrons.
3) The first shell can only hold 2 electrons.

Bohr Diagrams



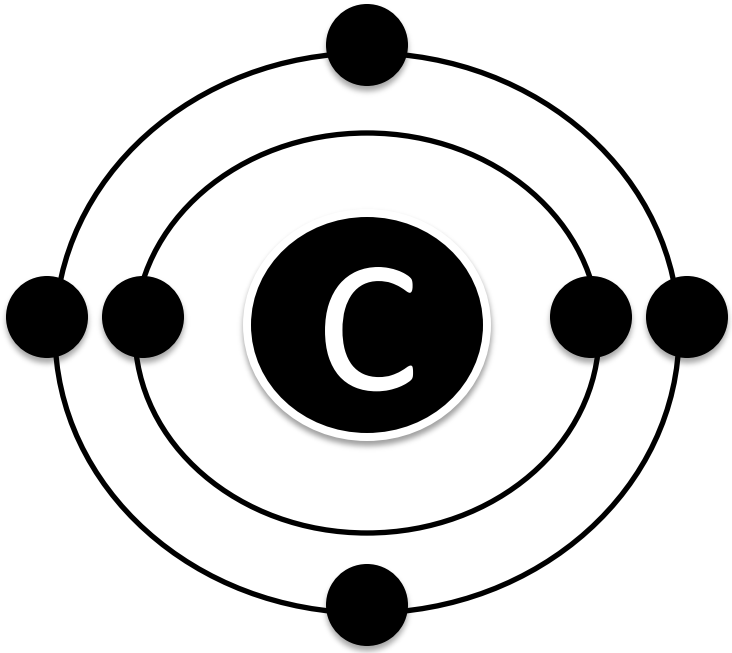
1) Since you have 2 electrons already drawn, you need to add 4 more.
2) These go in the 2nd shell.
3) Add one at a time - starting on the right side and going counter clock-wise.

Bohr Diagrams



1) Check your work.
2) You should have 6 total electrons for Carbon.
3) Only two electrons can fit in the 1st shell.
4) The 2nd shell can hold up to 8 electrons.
5) The 3rd shell can hold 8, but the elements in the first few periods only use 8 electrons.

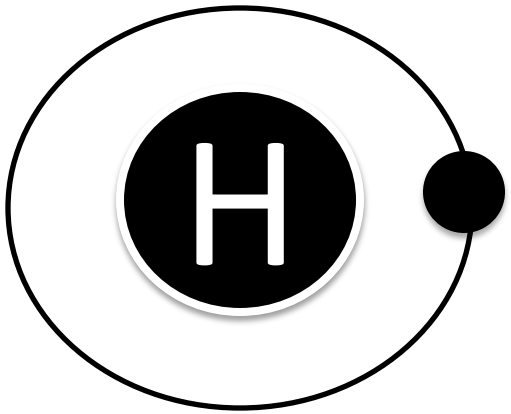
Bohr Diagrams



Try the following elements on your own:

a) H
b) He
c) O
d) Al
e) Ne
f) K

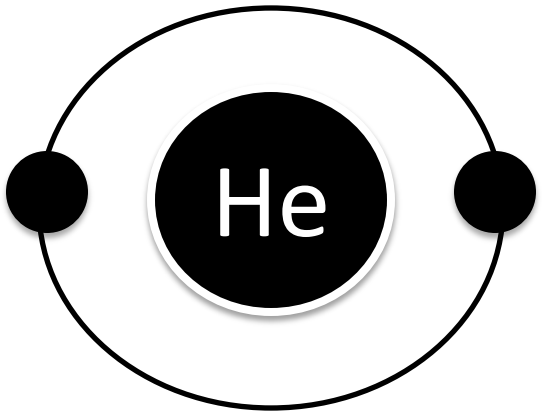
Bohr Diagrams



Try the following elements on your own:

a) H – **1 electron**
b) He
c) O
d) Al
e) Ne
f) K

Bohr Diagrams



Try the following elements on your own:

a) H

b) He **- 2 electrons**

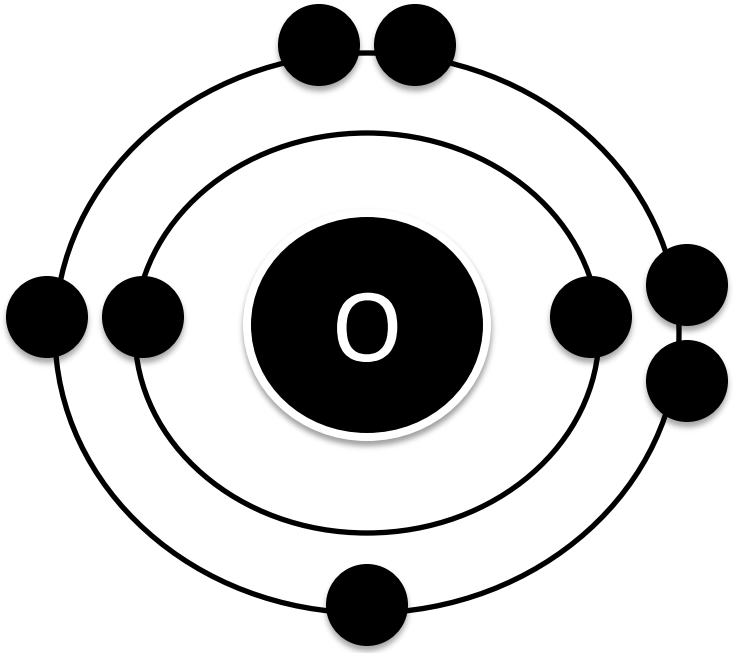
c) O

d) Al

e) Ne

f) K

Bohr Diagrams



Try the following elements on your own:

a) H

b) He

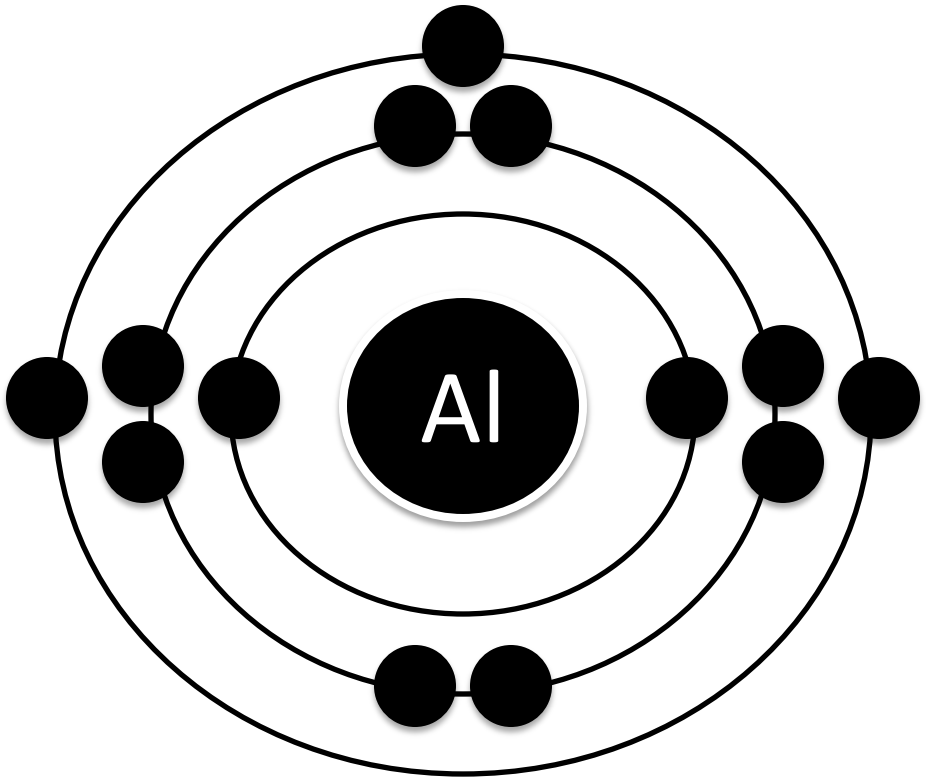
c) O **- 8 electrons**

d) Al

e) Ne

f) K

Bohr Diagrams



Try the following elements on your own:

a) H

b) He

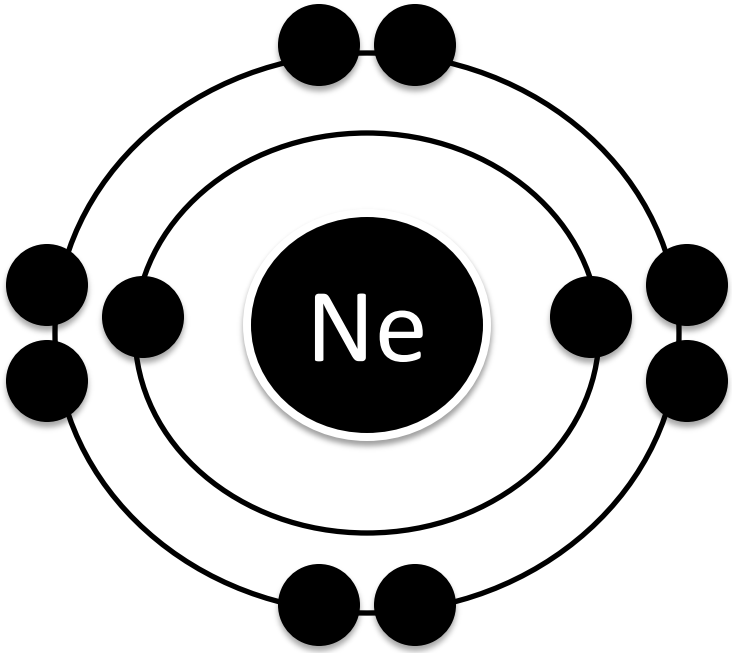
c) O

d) Al **- 13 electrons**

e) Ne

f) K

Bohr Diagrams



Try the following elements on your own:

a) H

b) He

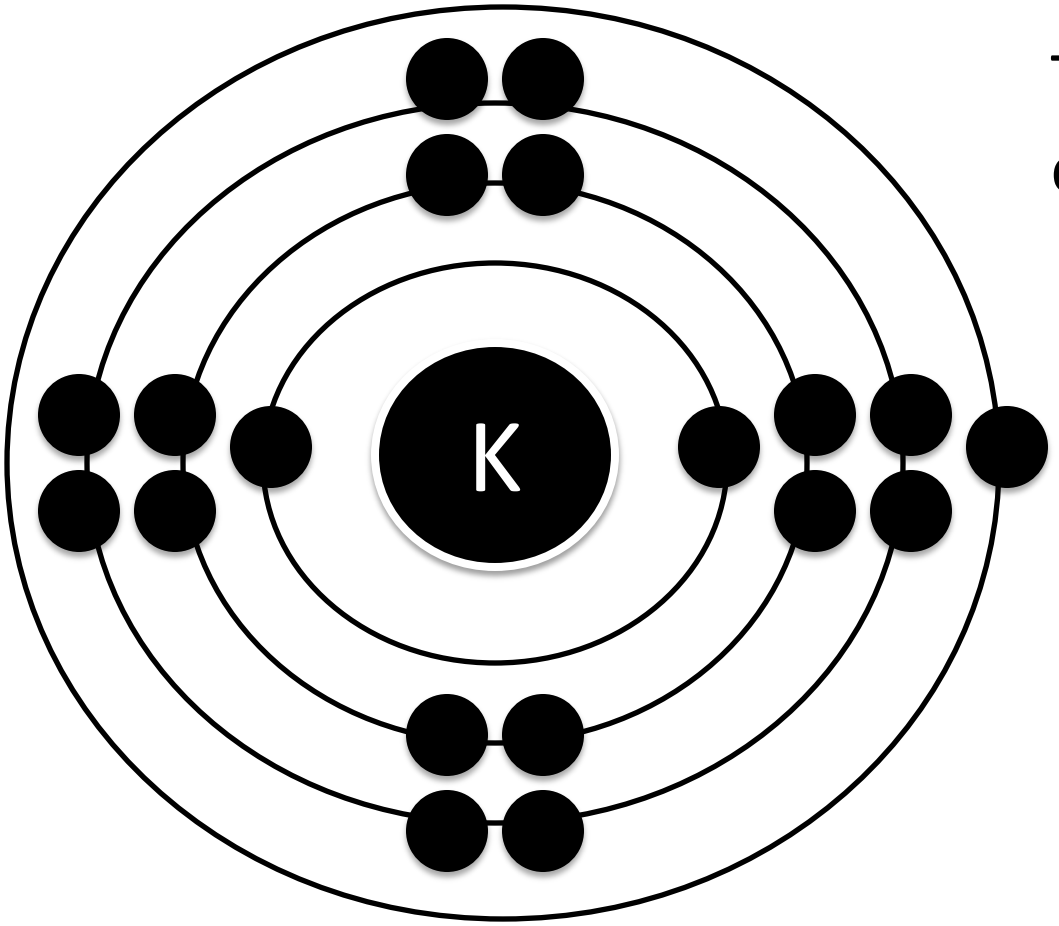
c) O

d) Al

e) Ne **- 10 electrons**

f) K

Bohr Diagrams



Try the following elements on your own:

a) H

b) He

c) O

d) Al

e) Ne

f) K **- 19 electrons**

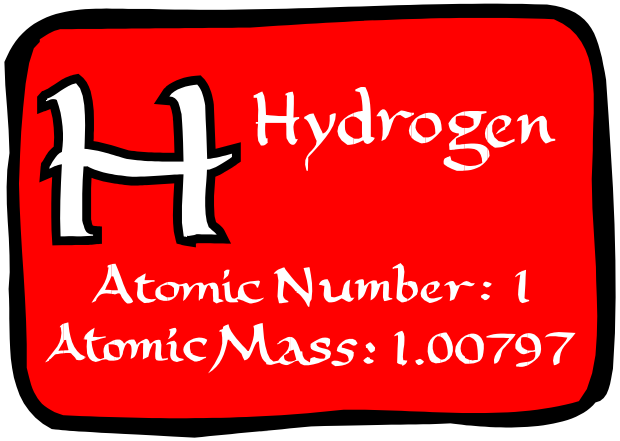
Bohr Diagrams

You should now be able to draw a Bohr Model for the first 20 elements in the periodic table.

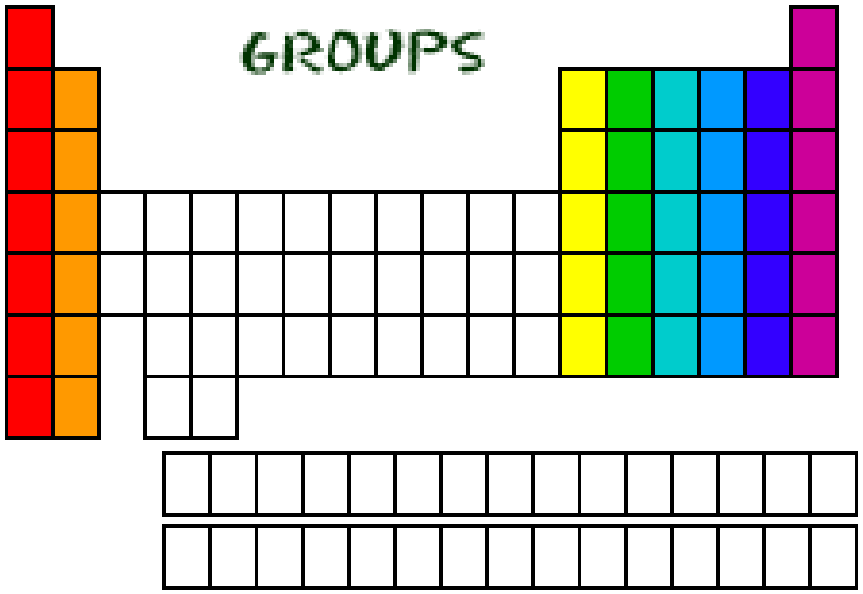
Any Questions?

Electron Dot Diagrams

1) Find your element on the periodic table.
2) Determine the number of valence electrons.
   - *Valence electrons are the number of electrons in the atom's outer most shell.*
3) This is how many electrons you will draw.



Electron Dot Diagram



- Find out which group (column) your element is in.
- This will tell you the number of valence electrons your element has.
- You will only draw the valence electrons.

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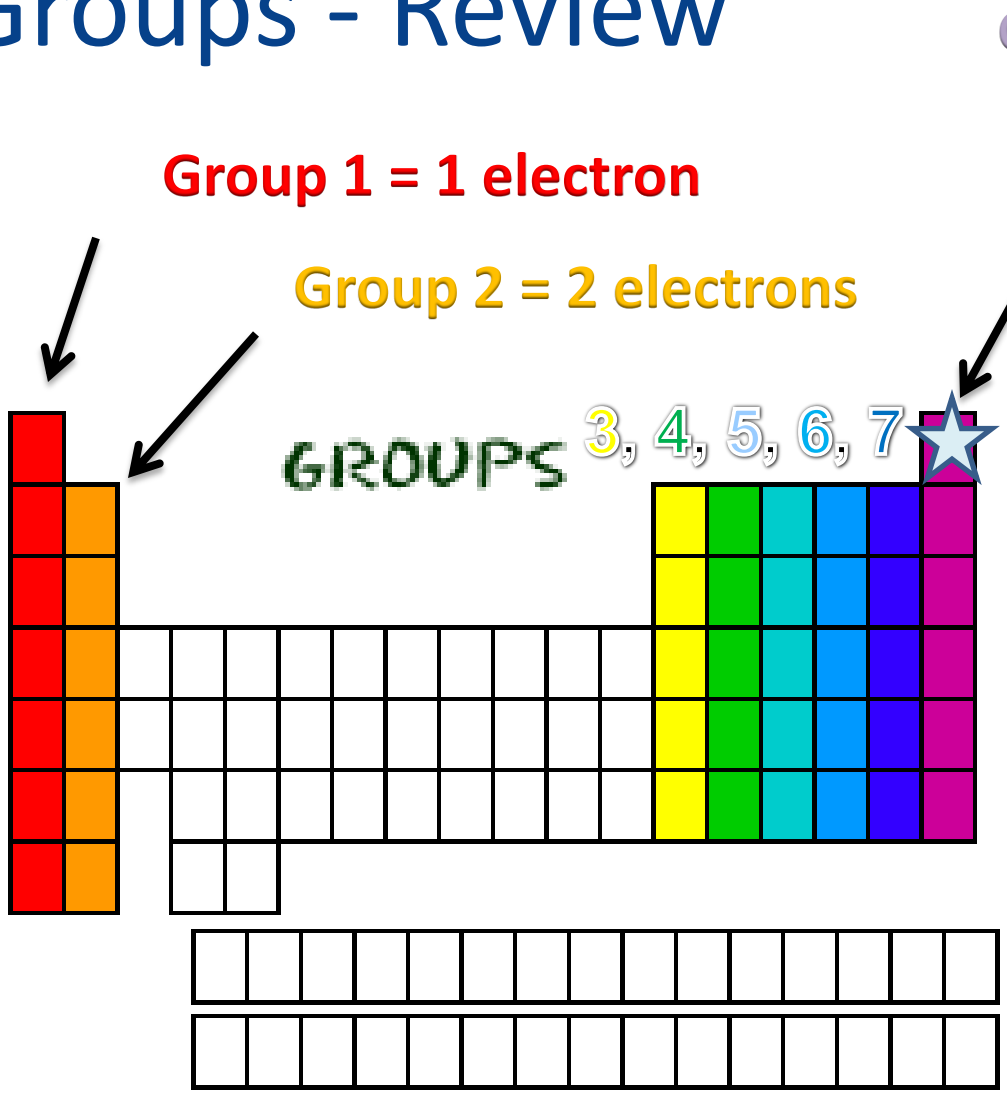
Groups - Review



Except for He, it has 2 electrons

- **Each column is called a "group"**
- **Each element in a group has the same number of electrons in their outer orbital, also known as "shells".**
- **The electrons in the outer shell are called "valence electrons"**

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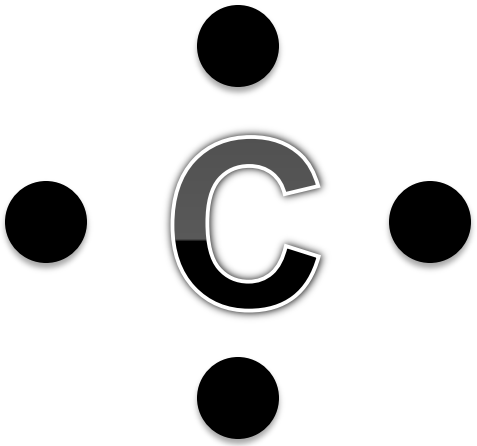
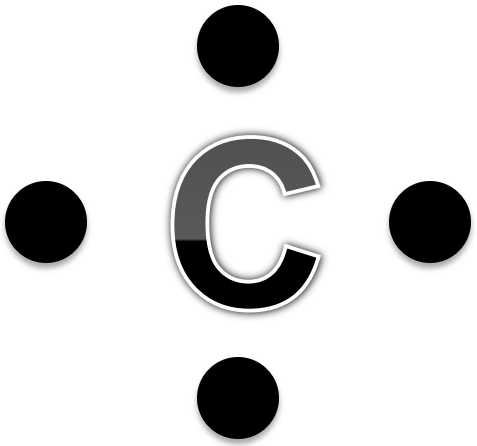
Electron Dot Diagram



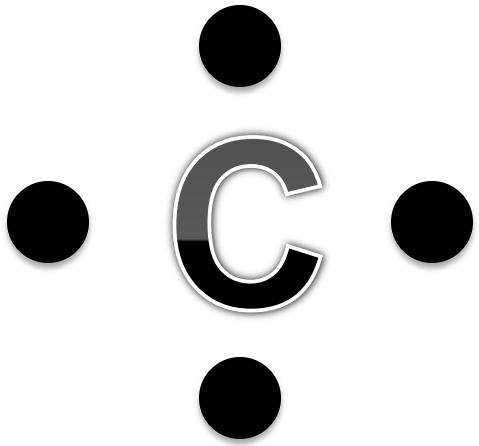
1) Write the element symbol.
2) Carbon is in the 4th group, so it has 4 valence electrons.
3) Starting at the right, draw 4 electrons, or dots, counter-clockwise around the element symbol.

Electron Dot Diagram



1) Check your work.
2) Using your periodic table, check that Carbon is in the 4^{th} group.
3) You should have 4 total electrons, or dots, drawn in for Carbon.

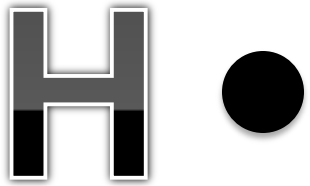
Electron Dot Diagram



On your worksheet, try these elements on your own:

a) H
b) P
c) Ca
d) Ar
e) Cl
f) Al

Electron Dot Diagram



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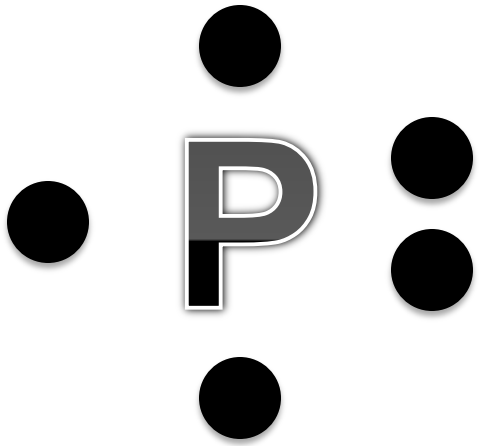

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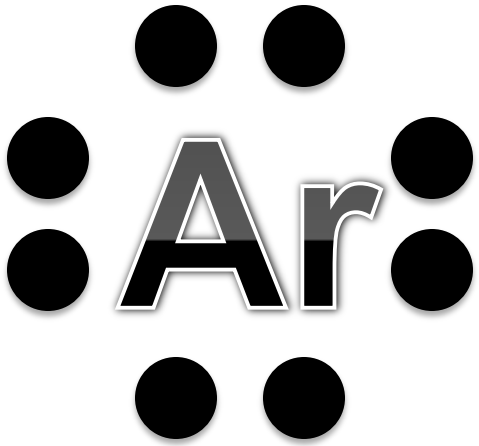

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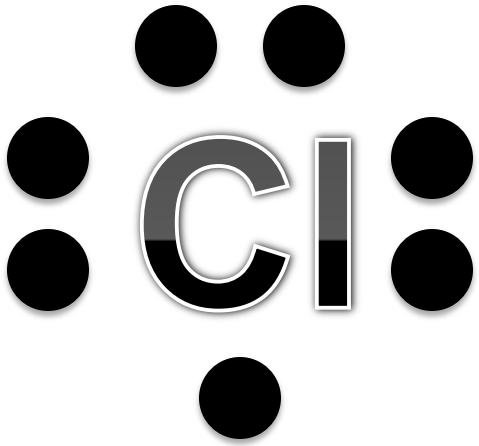

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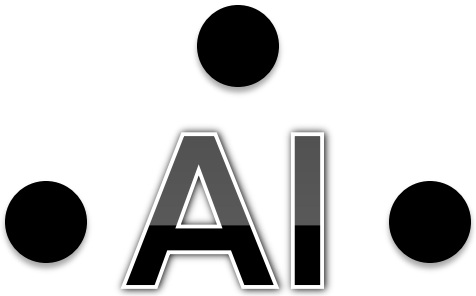

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Atomic Modeling

You should now be able to draw an electron dot diagram and a Bohr model for the first 20 elements in the periodic table.

Any Questions?