Unit 3 Modeling Atomic Structure

PACS

Mr. Maxwell

February 3, 2025

- Atomic Structure
 - Atomic Number
 - Mass Number
 - Hydrogen
 - Bohr Model
 - Energy Levels
 - The Periodic Table
 - Valence Electrons

Atomic Number

The is the number of

in the nucleus of an atom.

Atomic Number

The atomic number is the number of

in the nucleus of an atom.

Atomic Number

The atomic number is the number of protons in the nucleus of an atom.

The the total number of and in the nucleus of an atom.

The mass number the total number of of an atom.

and

in the nucleus

The mass number the total number of protons and of an atom.

in the nucleus

The mass number the total number of protons and neutrons in the nucleus of an atom.

Hydrogen

 ^{1}H

Hydrogen

 $^{1}\mathrm{H}$

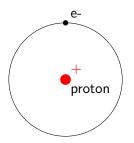
What does the 1 mean?

Hydrogen

 $^{1}\mathrm{H}$

What does the 1 mean?

1 is the total number of neutrons and protons.



 ${}^4_2{
m He}$



 $^4_2\mathrm{He}$

What does the 4 mean?



 ${}_{2}^{4}\mathrm{He}$

What does the 4 mean?

4 is the total number of neutrons and protons.

 ${}_{2}^{4}\mathrm{He}$

What does the 4 mean?

4 is the total number of neutrons and protons.

What does the 2 mean?

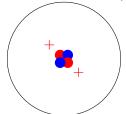
 ${}_{2}^{4}\mathrm{He}$

What does the 4 mean?

4 is the total number of neutrons and protons.

What does the 2 mean?

2 is the number of protons.



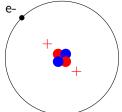
 ${}^4_2{
m He}$

What does the 4 mean?

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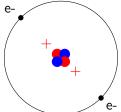
 ${}^4_2{
m He}$

What does the 4 mean?

4 is the total number of neutrons and protons.

What does the 2 mean?

2 is the number of protons.



 $^{7}_{3}\mathrm{Li}$

How many protons does Lithium have?

 $^{7}_{3}\mathrm{Li}$

How many protons does Lithium have? 3





 $^{7}_{3}\mathrm{Li}$



$$^{7}_{3}\mathrm{Li}$$





 $^7_3\mathrm{Li}$

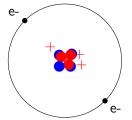


 $^7_3\mathrm{Li}$

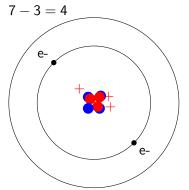
 $^{7}_{3}\mathrm{Li}$

 $^{7}_{3}\mathrm{Li}$

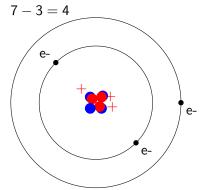
$$7 - 3 = 4$$



 $^7_3\mathrm{Li}$



$$^{7}_{3}\mathrm{Li}$$



Niels Bohr



The Bohr Model - Bohr proposed that an atom was a nucleus with electrons "orbiting" in different

Niels Bohr



The Bohr Model - Bohr proposed that an atom was a nucleus with electrons "orbiting" in different energy levels.

Electrons can only have certain energy values known as

Electrons can only have certain energy values known as energy levels

The electrons closest to the nucleus have the further from away have energy.

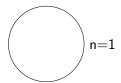
energy, while those

The electrons closest to the nucleus have the lowest energy, while those further from away have energy.

The electrons closest to the nucleus have the lowest energy, while those further from away have higher energy.

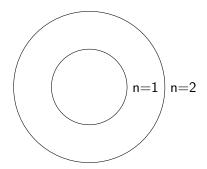
Energy Levels

The electrons closest to the nucleus have the lowest energy, while those further from away have higher energy.



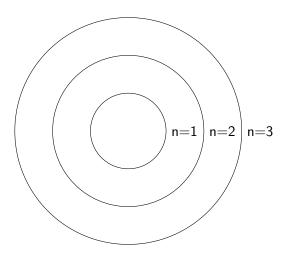
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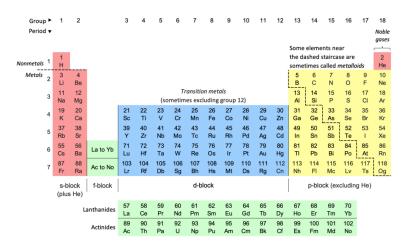


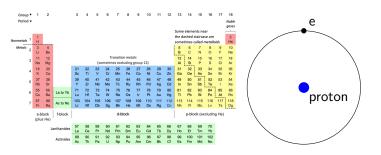
Energy Levels

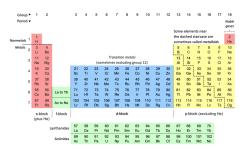
The electrons closest to the nucleus have the lowest energy, while those further from away have higher energy.



Energy Levels and the Periodic Table















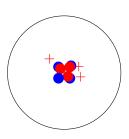




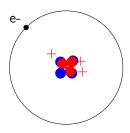


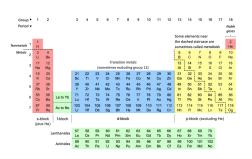


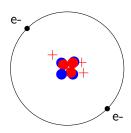


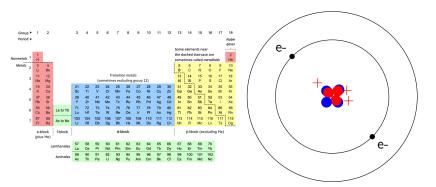


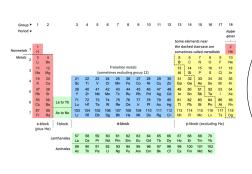


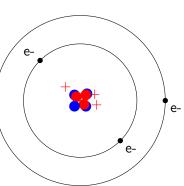


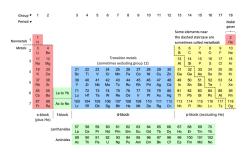


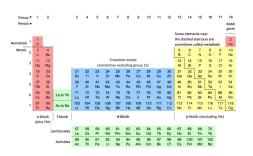




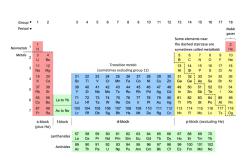


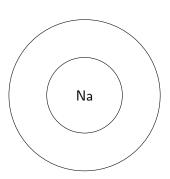


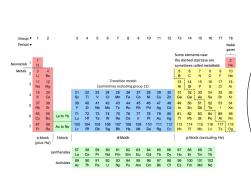


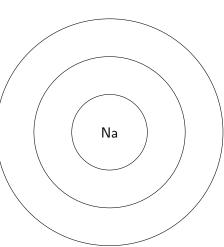




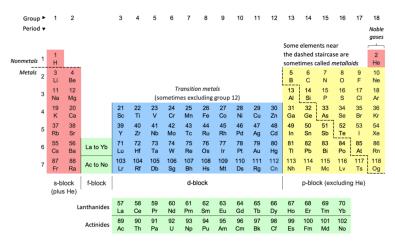






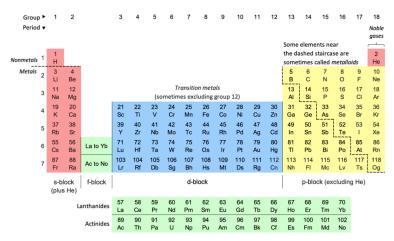


The Periodic Table



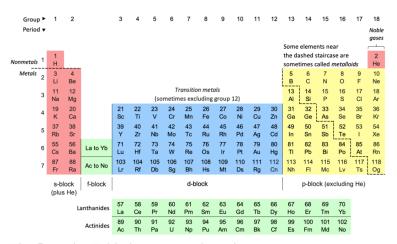
The Periodic Table has periods and groups.

The Periodic Table



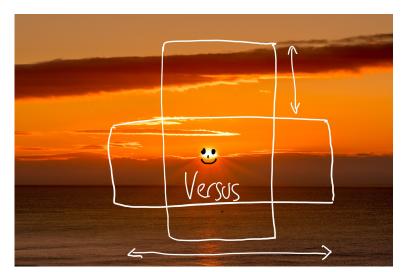
The Periodic Table has 7 periods and groups.

The Periodic Table



The Periodic Table has 7 periods and 18 groups.

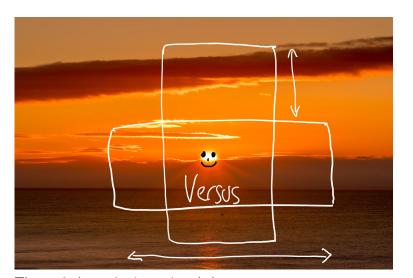
Horizontal and Vertical



The periods are

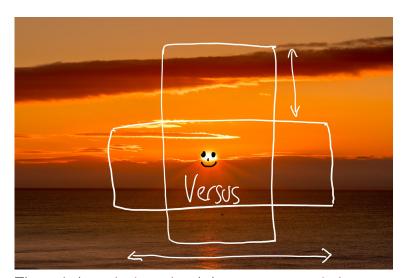
and the groups are

Horizontal and Vertical

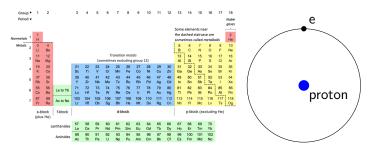


The periods are horizontal and the groups are

Horizontal and Vertical



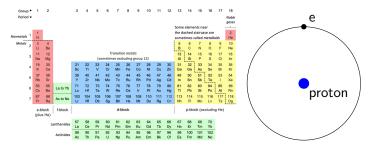
The periods are horizontal and the groups are vertical.



You can know the the periodic table.

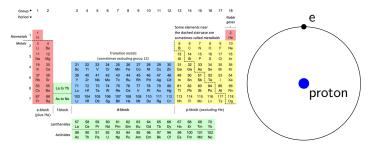
configuration of an element from its

in

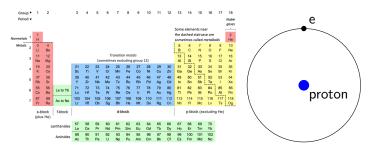


You can know the electron configuration of an element from its the periodic table.

in

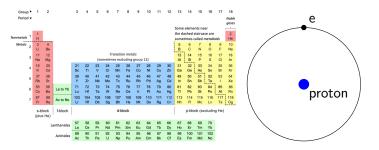


You can know the electron configuration of an element from its position in the periodic table.

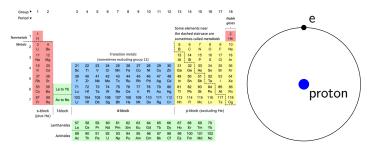


The number of electron number.

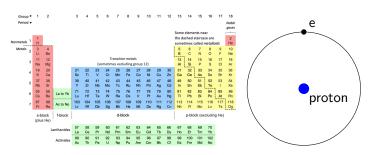
(or energy levels) is equal to the



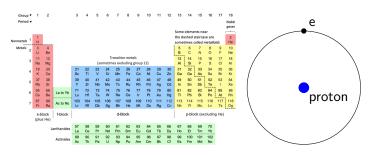
The number of electron shells (or energy levels) is equal to the number.



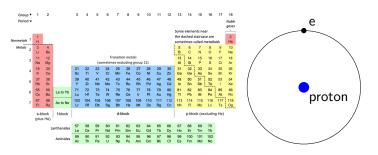
The number of electron shells (or energy levels) is equal to the period number.



The number of valence electrons is related to the



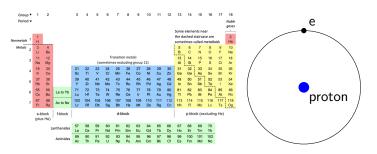
The number of valence electrons is related to the group number.



atoms in groups and are equal to the group number.

atoms in groups to are equal to the group number minus 10.

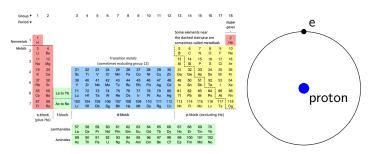
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atoms in groups one and are equal to the group number.

atoms in groups to are equal to the group number minus 10.

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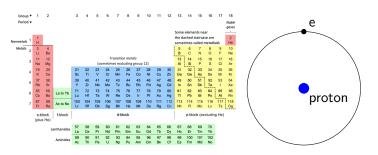


atoms in groups one and two are equal to the group number.

atoms in groups to are equal to the group number minus 10.

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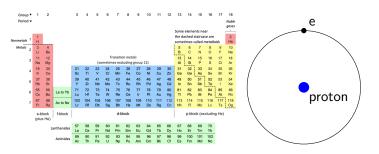


atoms in groups one and two are equal to the group number.

atoms in groups 13 to are equal to the group number minus 10.

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atoms in groups one and two are equal to the group number.

atoms in groups 13 to 18 are equal to the group number minus 10.