



Electronic Structure

You can use information found on the periodic table (see pages 52–53) to calculate the electronic structure of an atom. Scientists can display an atom's electronic structure by using drawings (see page 28) or list the numbers of electrons held in each shell—for example: 2, 8, 3.

Method one: using the atomic number

Take the atomic number (total number of electrons) and share out the electrons between the shells until they are filled (following the rules on page 28) to work out the electronic structure.



1. Look up aluminum's atomic number on the periodic table. Aluminum's atomic number is 13.

2. Follow the electron shell rules on page 28. You have 13 electrons to share out between three shells.

3. Aluminum's electronic structure is 2, 8, 3.



Key Facts

- ✓ An atom's electronic structure lists the number of electrons in each of its shells.
- ✓ An electronic structure can be calculated if you know the number of electrons and shells within each atom.
- ✓ The electronic structure can be calculated for 20 elements using two methods.

Method two: using periods and rows

An element's period number is equal to the number of shells its atoms have. An element's group number is equal to how many electrons are in the outermost shell.

1. Aluminum is in period 3, so its atoms have three shells.

2. Aluminum is in group 3, so its atoms have three electrons in their outermost shells.

3. Aluminum's inner two shells must be full because inner shells must be filled first.

4. If aluminum's inner shell has two electrons and its outer shell has three electrons, there are eight electrons left for its middle shell. So, aluminum's electronic structure is 2, 8, 3.

	1							0
1	1 H Hydrogen							2 He Helium
	2	3	4	5	6	7		
2	3 Li Lithium	4 Be Beryllium	5 B Boron	6 C Carbon	7 N Nitrogen	8 O Oxygen	9 F Fluorine	10 Ne Neon
3	11 Na Sodium	12 Mg Magnesium	13 Al Aluminum	14 Si Silicon	15 P Phosphorus	16 S Sulfur	17 Cl Chlorine	18 Ar Argon
4	19 K Potassium	20 Ca Calcium						