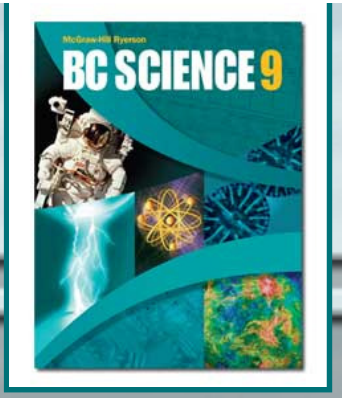
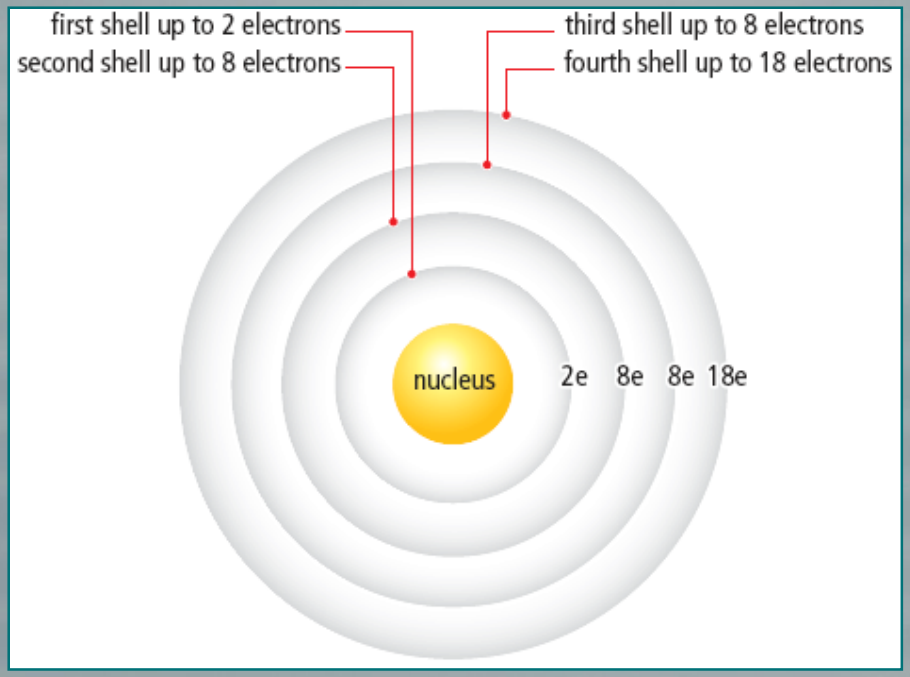
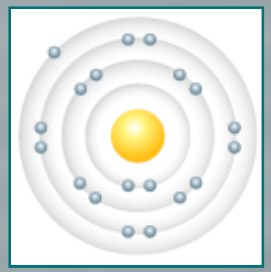
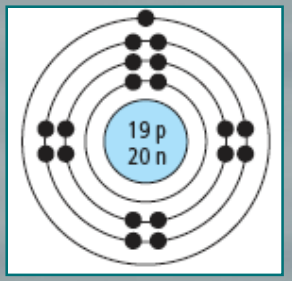
2.3 Periodic Table and Atomic Theory

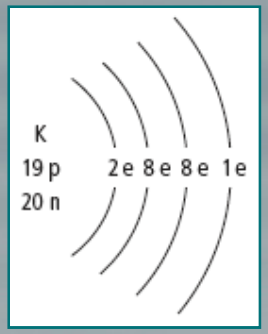


- Elements with similar properties have similar electron arrangements
- Bohr models show electron arrangement in shells









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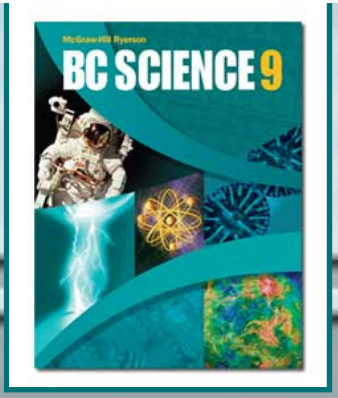
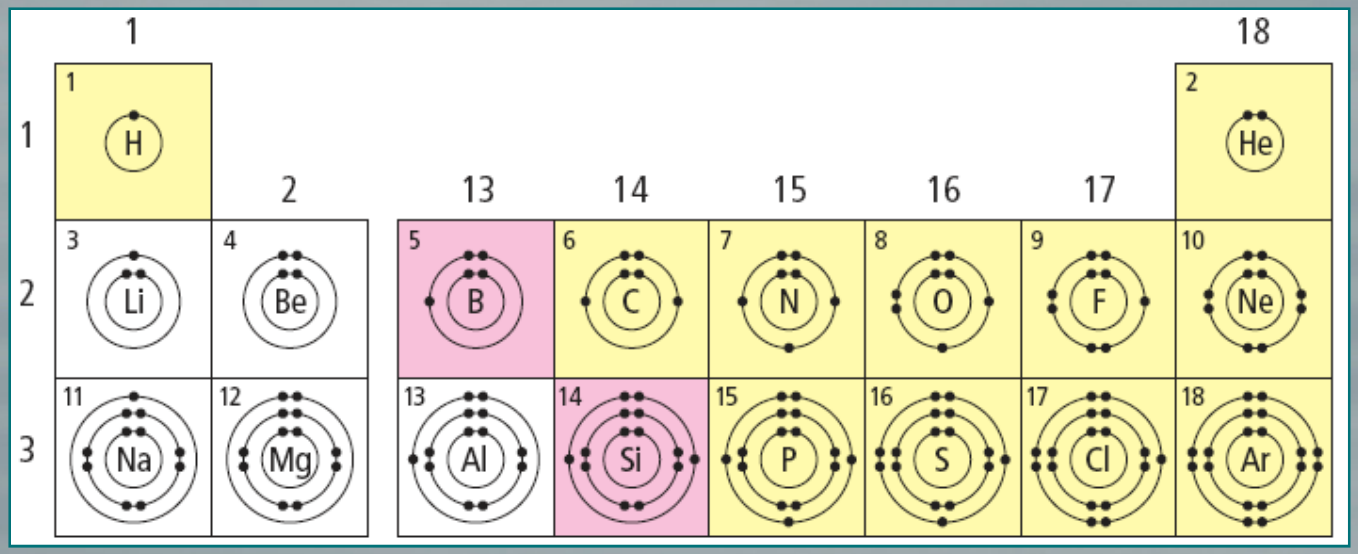
Bohr model patterns



- Chemical families on the periodic table have the same number of valence electrons
- Elements in the same period have the same number of shells
- Period number indicates the number of electron shells



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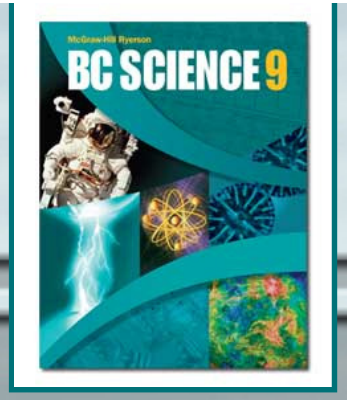
Atom Stability



- Noble gases are very unreactive because their atoms have filled valence shells. Filled shells make atoms stable. Atoms with filled shells do not easily trade or share electrons.
- Other atoms gain or lose electrons in order to achieve the stability of noble gases. Gaining or losing electrons makes atoms into ions.
  - Metals lose electrons to form positive ions
  - Non-metals gain electrons to form negative ions
  - Ions have a similar electron arrangement to the nearest noble gas
  - Example: Sodium ion (**Na^+**) has 11 protons (**11^+**) and 10 electrons (**10^-**) for a total charge of **1^+**

	Lithium	Magnesium	Chlorine
Atom	Li 3 p 2, 1	Mg 12 p 2, 8, 2	Cl 17 p 2, 8, 7
Ion	Li^+ 3 p 2	Mg^{2+} 12 p 2, 8	Cl^- 17 p 2, 8, 8

Take the Section 2.3 Quiz

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