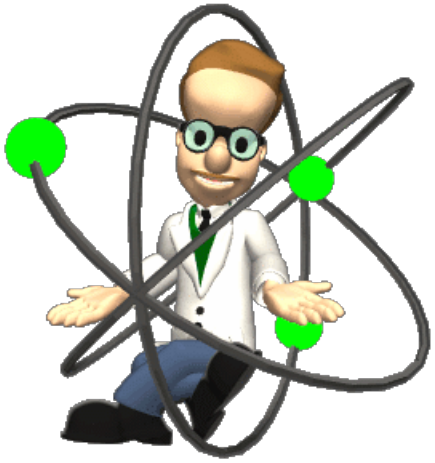
Modern Atomic Theory

Atomic Properties and the Periodic Table

Metals and Nonmetals

Atomic Properties and the Periodic Table

- The atomic theory is an attempt to help us understand why things occur.
- This can help us better control the chemical events in our daily lives.

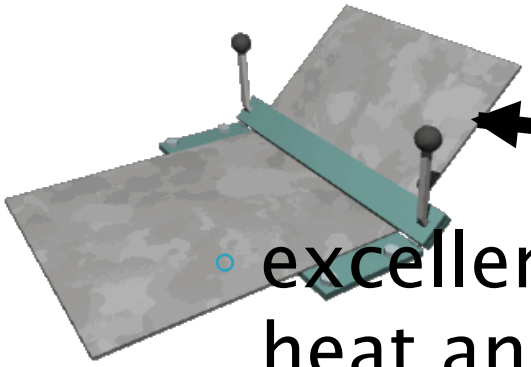


Atomic Properties and the Periodic Table

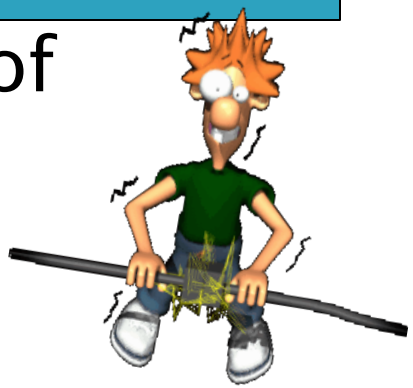
Metals and Nonmetals

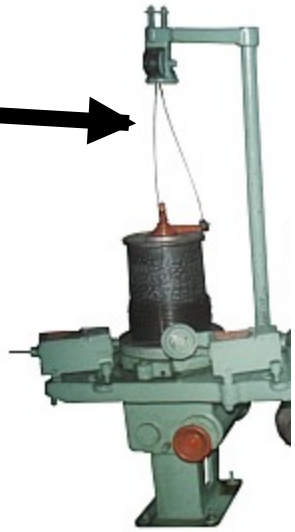
- **Metals** have the following physical properties:
  - lustrous appearance
  - ability to change shape without breaking
  - excellent conductor of heat and electricity

Lustrous
(shiny)



pounded into a thin sheet
or pulled into a wire



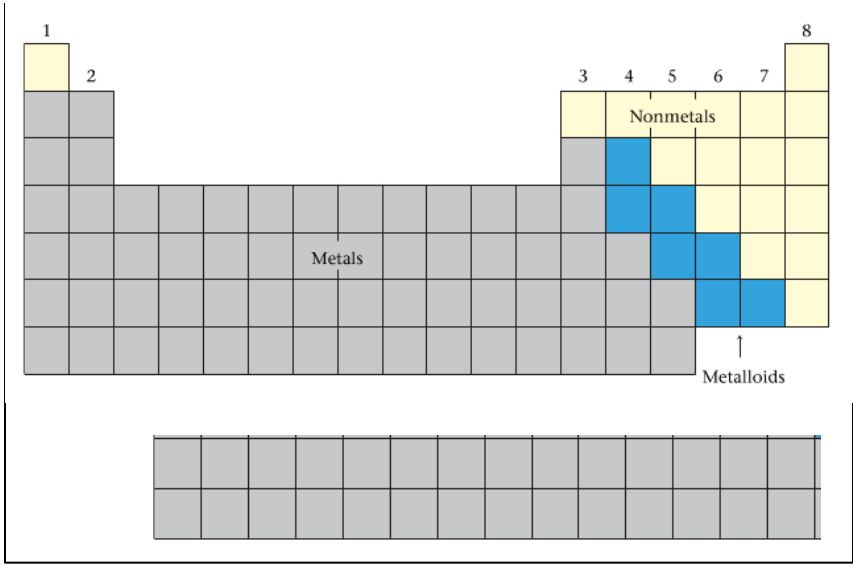


Atomic Properties and the Periodic Table

- **Nonmetals** usually are not lustrous and do not make good conductors of heat or electricity, though there are exceptions.
- *Chemical* differences:
  - Metals tend to lose electrons to form positive ions. +
  - Nonmetals tend to gain electrons to form negative ions. −
- When they react, electrons are usually transferred from the metal to the nonmetal.

Atomic Properties and the Periodic Table

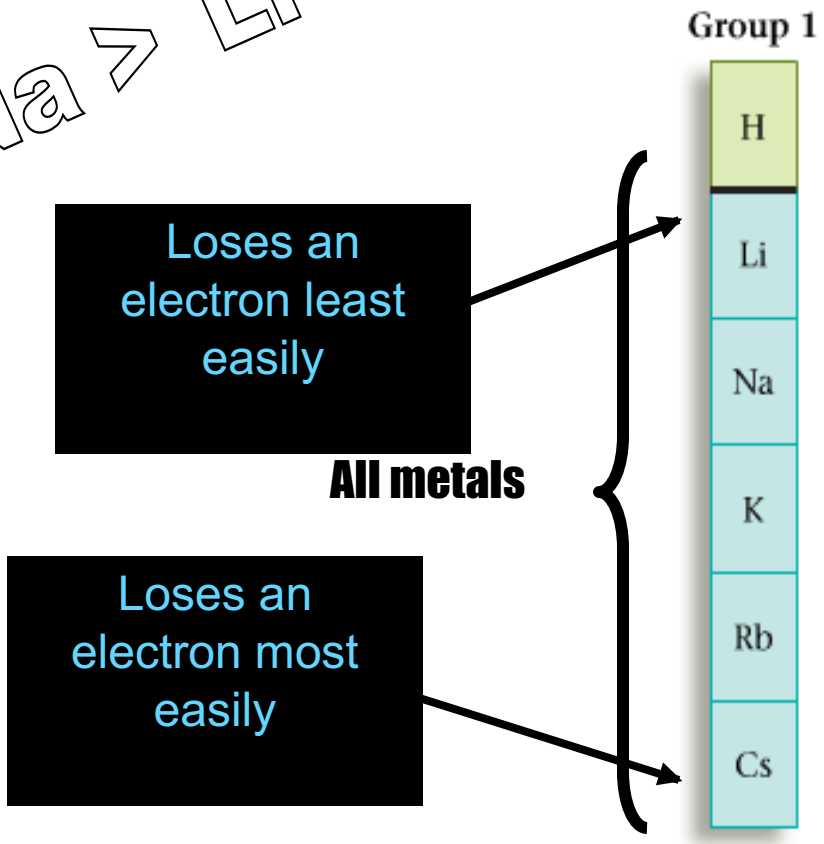
- Most of the elements are **metals**.
- A few of the elements are **nonmetals**.
- 7 elements are **metalloids** or **semimetals**.
  - These exhibit both metallic and nonmetallic behaviors.
  - Si, Ge, As, Sb, Te, Po, At



Atomic Properties and the Periodic Table

- It is important to understand that not all metals (or nonmetals) behave exactly the same.
  - For example:

Cs > Rb > K > Na > Li



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