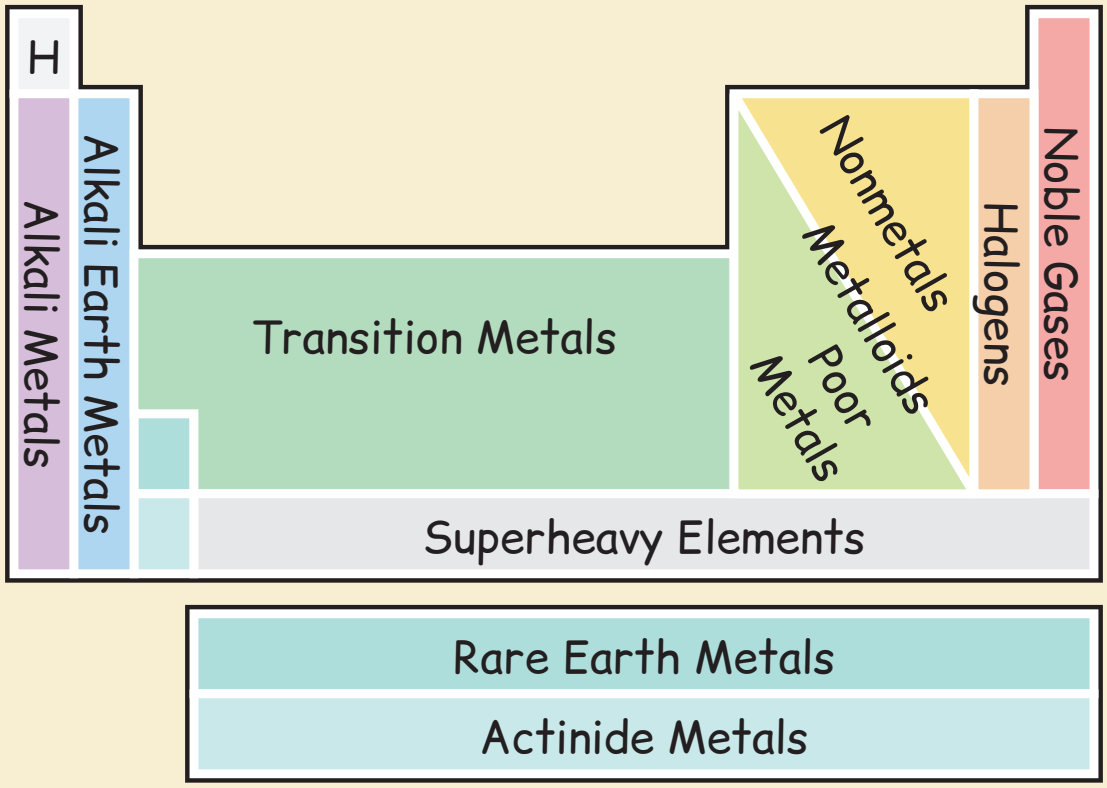
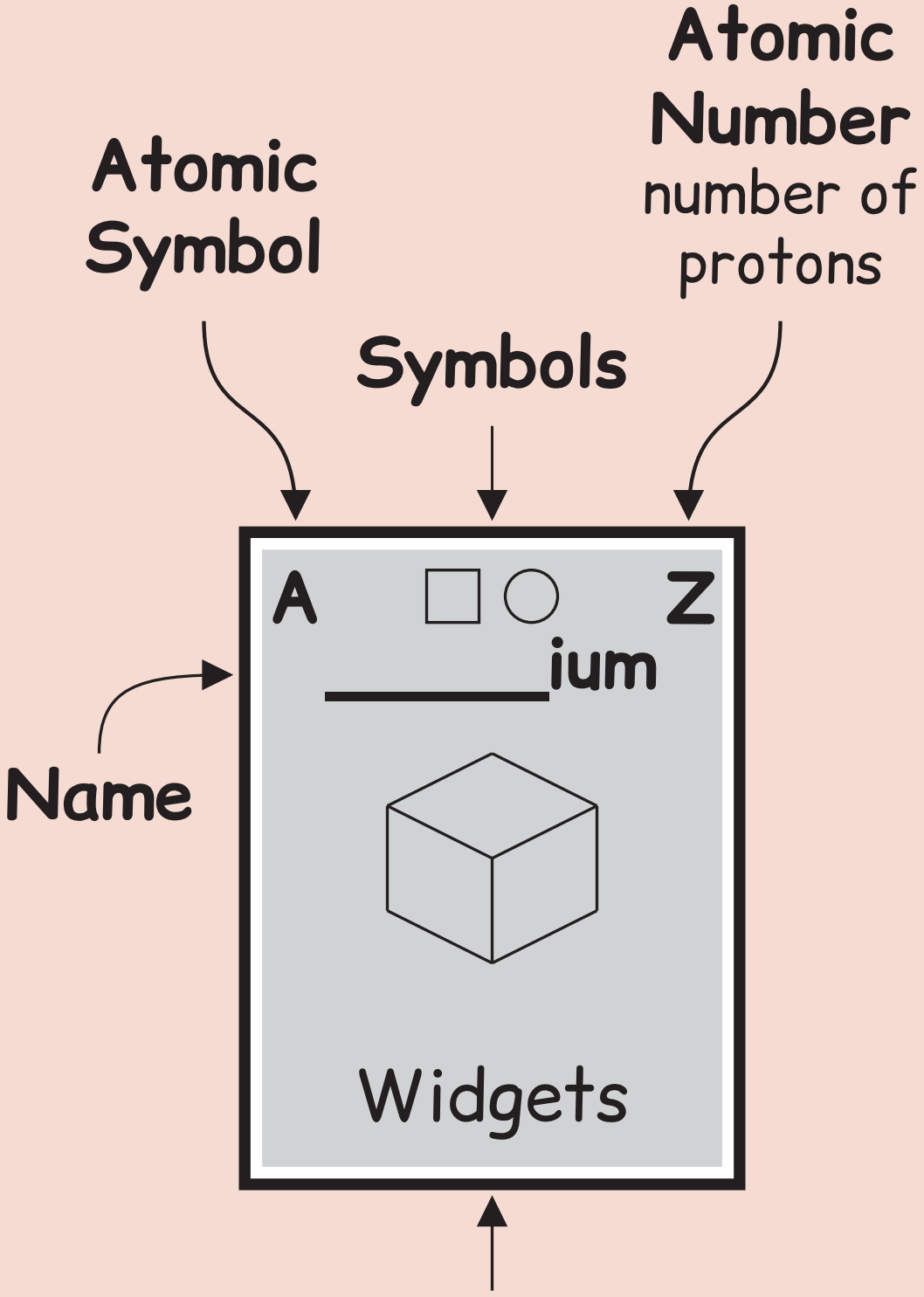
elements.wlonk.com

The Periodic Table of the Elements, in Pictures and Words





Solid

Liquid

Gas

at room temperature

The color of the symbol is the color of the element in its most common pure form.

Examples
- metallic solid
- red liquid
- colorless gas

Human Body
top ten elements by weight

Earth's Crust
top eight elements by weight

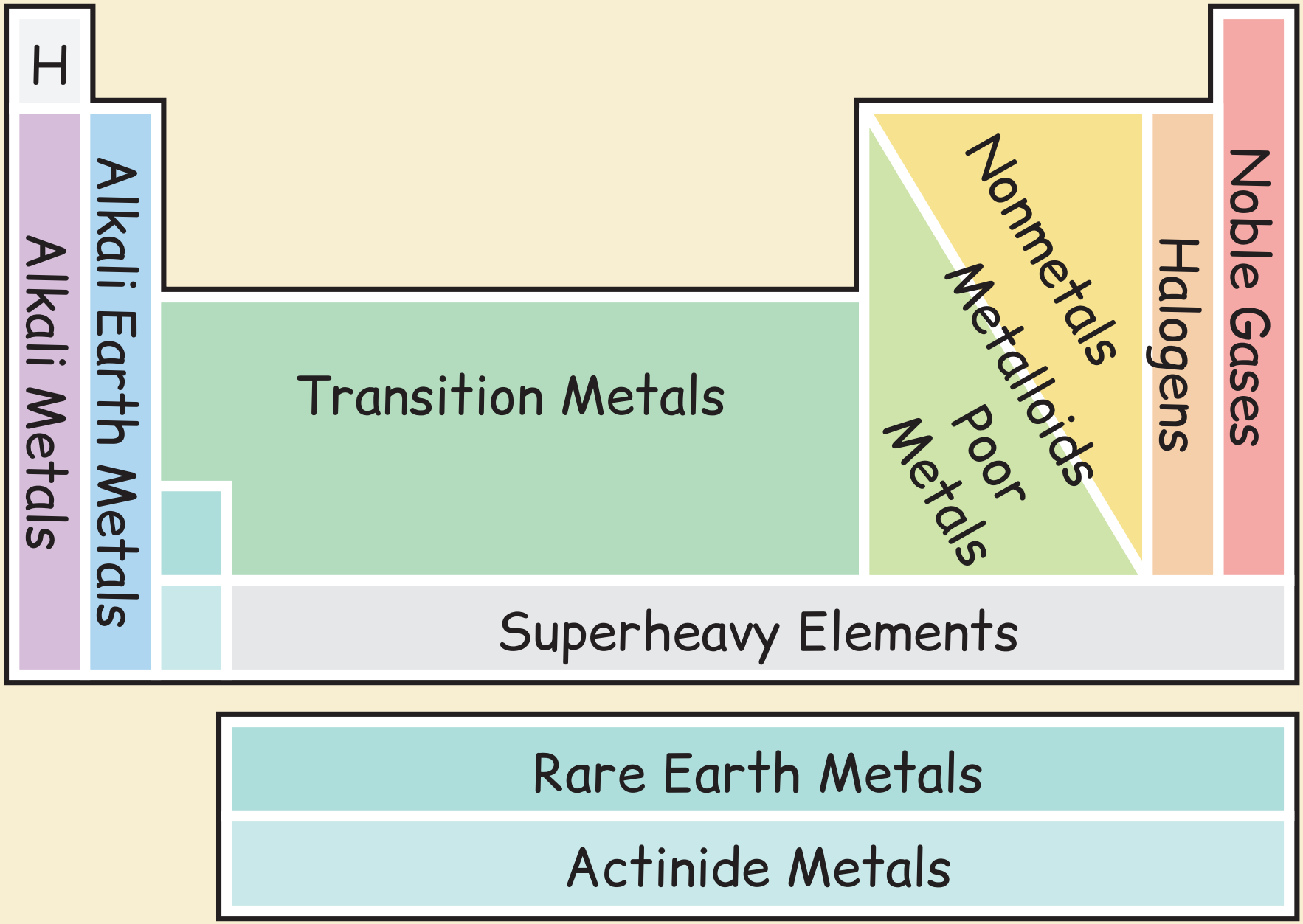
Magnetic
ferromagnetic at room temperature

Noble Metals
corrosion-resistant

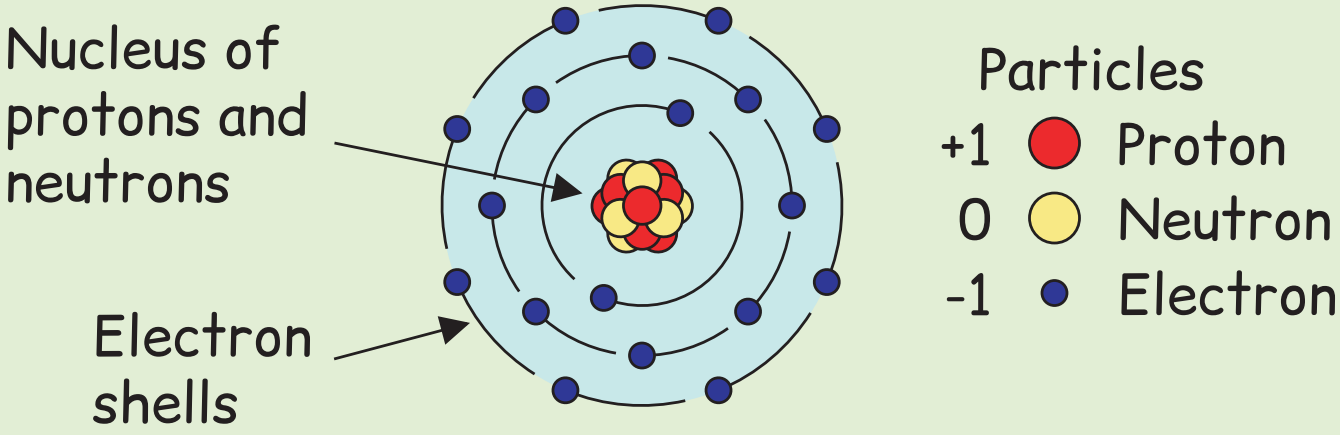
Radioactive
all isotopes are radioactive

Only Traces Found in Nature
less than a millionth percent of earth's crust

Never Found in Nature
only made by people



Atoms



An **atom** has a **nucleus**, made of **protons** and **neutrons**, surrounded by **electrons** orbiting in cloud-like **shells**. Smaller shells are surrounded by larger shells.

The **atomic number** is the number of protons in an atom. This determines the chemical properties of the atom.

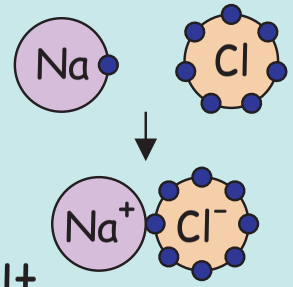
Protons have positive **electric charge**, neutrons are neutral, and electrons are negative. Normally, an atom has equal numbers of protons and electrons. An **ion** is a charged atom with more or fewer electrons than protons.

The **atomic weight** of an element is the average number of protons plus neutrons. You can easily estimate the atomic weight: it is usually 2 to 2.5 times the atomic number.

An **element** is a substance made from one or more atoms of the same atomic number. A **compound** is a substance made from two or more elements chemically bonded.

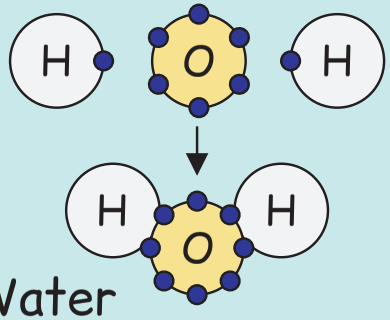
Chemical Bonding

Atoms form **molecules** by **bonding** together. Atoms give, take, or share electrons to achieve full outer electron shells.



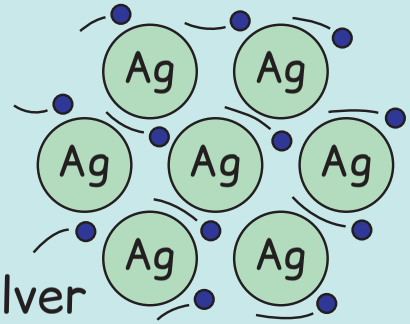
Salt

Ionic bond
One atom takes an electron from another atom and the oppositely charged ions attract.



Water

Covalent bond
Atoms share their outer electrons.



Silver

Metallic bond
Shared outer electrons flow, conducting heat and electricity.

Groups

Elements in the same **group**, or column, are similar because they typically have the same number of outer electrons. This table shows some easy-to-remember common numbers for each group.

Group number	1	2	3-12	13	14	15	16	17	18
Outer electrons*	1	2	2	3	4	5	6	7	8
Valence number*	+1	+2	+2	+3	+4,-4	-3	-2	-1	0

* typical

The valence number is the number of electrons given (+) or taken (-) when bonding.