

Matter

- ✳ Anything that occupies space and has a mass
- ✳ what the universe is made of
- ✳ what YOU are made of

Atoms

☞ basic building blocks of matter

Elements

- simplest pure substance
- made up of only ONE type of atom
- cannot be broken down into simpler substances

Compounds

- ☺ Pure substances, made up of more than one element
- ☺ Two or more elements that are chemically combined

Examples

Water → Hydrogen and oxygen

Sugar → Carbon, hydrogen, and oxygen

Molecules

Most compounds are made up of molecules.

A molecule is made up of 2 or more atoms chemically bonded together.

- ✘ Smallest particle of a compound that has all of the properties of that compound

Chemical Formulas

- ✘ Combinations of chemical symbols
- ✘ Shorthand way of representing chemical substances
- ✘ Most represent compounds

Writing Chemical Formulas

- ☞ Symbol for each element in the compound
- ☞ Subscripts – the small number placed to the lower right of the symbol – gives the number of atoms of the element in the compound

Example

Sulfuric Acid \rightarrow H_2SO_4

2 hydrogens

1 sulfur

4 oxygens

Chemical Equations

⌘ Like a “chemical sentence”

- Chemical symbols = letters
- Chemical formulas = words

⌘ Describe a chemical process or chemical reaction

⌘ Substances changed into new and different substances through rearrangement of their atoms

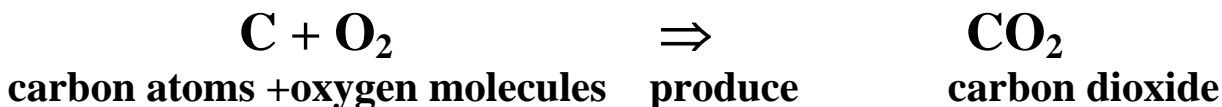
Example

Charcoal burning in a barbeque grill

Carbon atoms in the charcoal are combining with oxygen molecules in the air to form the gas



CARBON DIOXIDE

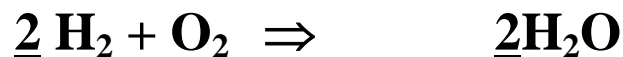


Here’s another one:



What’s wrong with the above chemical equation?

It's not balanced!



Why do equations have to be balanced???

What goes in must come out!!!

We call the number in front of the chemical symbols a coefficient.

Atoms

3 main subatomic parts:

- **Proton – positively charged**
- **Neutron – neutral – no charge**

These are found in the NUCLEUS of the atom

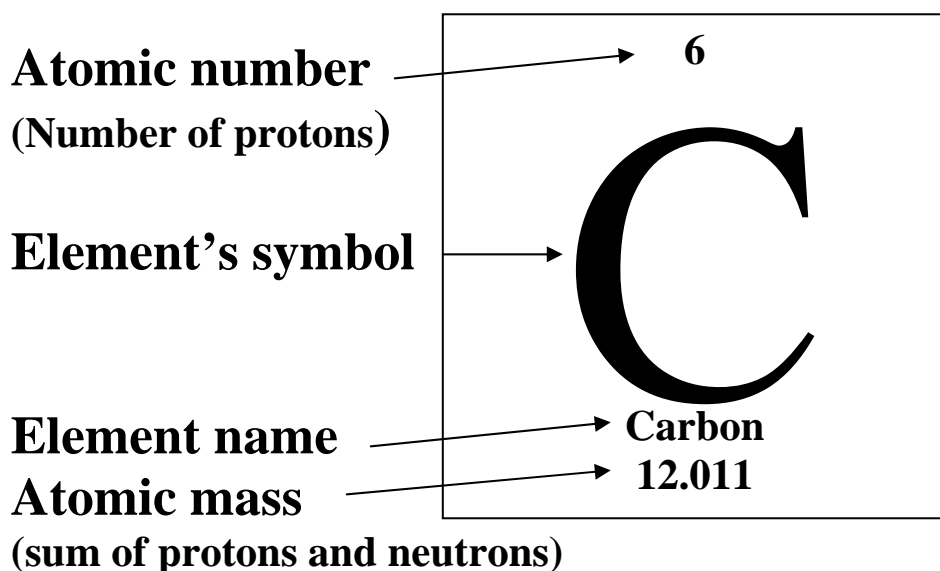
- **Electron – negatively charged**

These are whirling around the outside of the nucleus

- ✓ **The number of protons determines what the element is**
- ✓ **The number of protons equals the ATOMIC NUMBER of that element**
- ✓ **The atomic number identifies the element**

- ✓ The atomic number of an element never changes (the number of protons never change)
- ✓ The number of neutrons **CAN CHANGE!**

Atoms of the same element that have the same number of protons, but **DIFFERENT** numbers of neutrons are called **ISOTOPES**.



Chemical Bonding

- ☞ The combining of atoms of element to form new substances

Ionic Bonding

- ☞ Transfer of electrons from one atom to another

Covalent Bonding

- ☞ No transfer of electrons, but actual sharing of the electrons