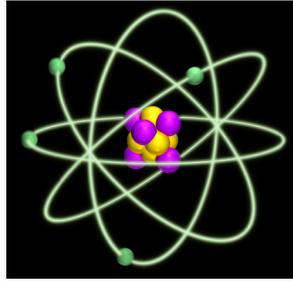


MODULE: *Matter 1*

Activity Sheet 1.4: Atoms Words and Meanings

Matter	is the stuff that everything is made of.
A material	is what a particular object is made of. A pure substance is a material that contains only one type of molecule. For example, pure water contains only water molecules, and pure propane (bottled gas) contains only propane molecules. (In chemistry a 'pure substance' can also be called a 'substance', which outside chemistry means any type of material.)
An element	is one specific type of pure substance; an element's molecules contain only one type of atom. For example, oxygen contains only oxygen atoms; copper contains only copper atoms.
A compound	is the other kind of pure substance; its molecules contain different types of atoms chemically joined together.
An atom	is the smallest particle of matter that can exist on its own. We know of about 120 different sorts of atom, of which 90 are found in the Earth's crust.
A molecule	is a particle made by atoms chemically combining to make a material with different properties from those of the original atoms. There are millions of different sorts of molecule.
Ion	is an atom that has an electric charge, either positive or negative. A compound can be made of positive and negative charged ions (made from atoms or groups of atoms) held together by electrostatic attraction.

Sub-atomic particles



This symbol for an atom shows that it is made of separate bits, and is not just a single particle. But this is only a diagram, not a real picture of an atom. It is a model for thinking about atoms.

- Atoms are made from protons, neutrons and electrons.
- Protons and neutrons make up nearly all of the mass of an atom, and they are in the central nucleus.
- Electrons orbit the nucleus and move very fast. All chemical bonding between atoms to make compounds involves these electrons.
- We cannot put protons, neutrons and electrons together to make new atoms. This happens INSIDE STARS.
- As more protons, neutrons and electrons are added to an atom, the atom becomes heavier and more complex.

We can break up an atom into smaller parts.

- It takes a very high speed collision between atoms to smash them apart. Scientists make this happen in special machines like the Large Hadron Collider at Geneva, Switzerland (see image).
- When we have broken an atom up, we cannot put it back together. The material is destroyed.

