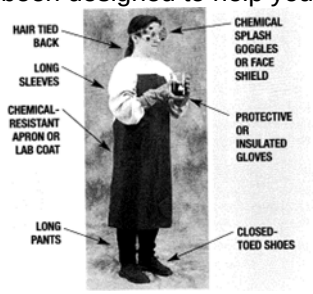
Topic 1 Exploring Matter

Safety First

A good science lab is a safe one. All of the procedures, equipment and chemicals you use have been designed to help you understand the science principles you are investigating.



Go over the safety notes provided (link below) and be prepared to take the safety test in class (do the practice test - link below - to help prepare you – the test in class will be slightly different). Do the two activities in the Science Focus textbook as well (p. 93 Put Safety First & p. 94 Fasten Your Safety Seat Belt)

Notes: http://www.edquest.ca/Labs/labsafety.html
Practice Test: http://www.edquest.ca/Tests/safety.html

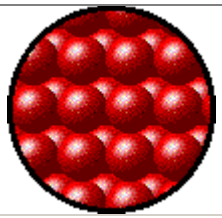
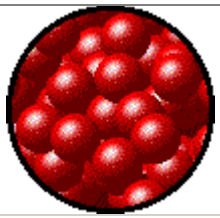
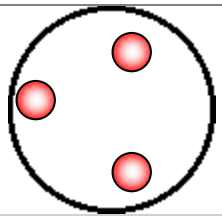
Classifying Matter

The particle model of matter is an important part of what you will be learning in this unit.
Recall that:

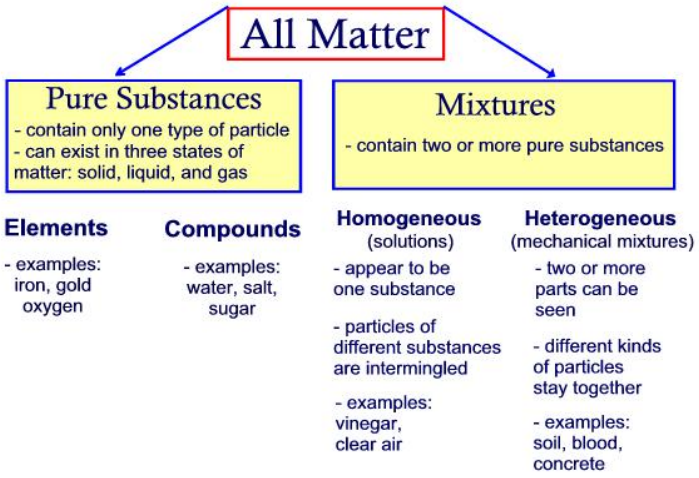
- All matter is made up of tiny particles.
- All the particles in a substance are the same; different substances are made of different particles.
- There are attractive forces among particles-these attractions may be strong or weak.
- The particles are always moving; the more energy the particles gain, the faster they move.
- There are spaces among the particles.

The Particle Model of Matter is a scientific model which helps to visualize a process we cannot see directly. The first two points help us to understand that particles make up matter. The other three points help to explain density and how matter behaves when temperature changes.

Matter exists in three states: solid, liquid, or gas.
The Particle Model of Matter is useful in explaining the differences among solids, liquids, and gases. Illustrations such as these help to clarity the particle theory.

		
Solids have a definite shape and volume because the particles of a solid can move only a little. They vibrate back and forth, but strong forces hold them in fixed positions.	Liquids take the shape of its container because the particles can move around more freely than they can in solids. A liquid's particles are held together by strong attractions to each other, so a liquid, like a solid, occupies a definite volume.	Gases always fill whatever container they are in. The attractions among the particles of a gas are so weak that individual particles are quite far apart, with spaces among them. Since gas particles are moving constantly and randomly in all directions, they spread throughout their container, no matter what its shape and volume.

Mixtures of Matter



A pure substance is made up of only one kind of matter and has its own unique set of physical properties.

Types of Pure Substances

- element

- cannot be broken down into any simpler substance

- compound

- is a combination of two or more elements in fixed proportions

A mixture is a combination of 2 or more pure substances

Types of Mixtures

- mechanical (***heterogenous***)

- each substance in the mixture is visible

- solution (***homogeneous***)

- each substance is not clearly visible
(A substance dissolved in water is called an aqueous solution)

- suspension

- is a cloudy mixture in which tiny particles are held (suspended) with another substance, and can be filtered out

- colloid (emulsions)

- is also a cloudy mixture, but the particles are so small that they cannot be filtered out easily (emulsions are types of colloids in which liquids are dispersed in liquids)

Whether a mixture is a solution, colloid or suspension depends on the size of the particles, solubility and mixing ability (miscibility)