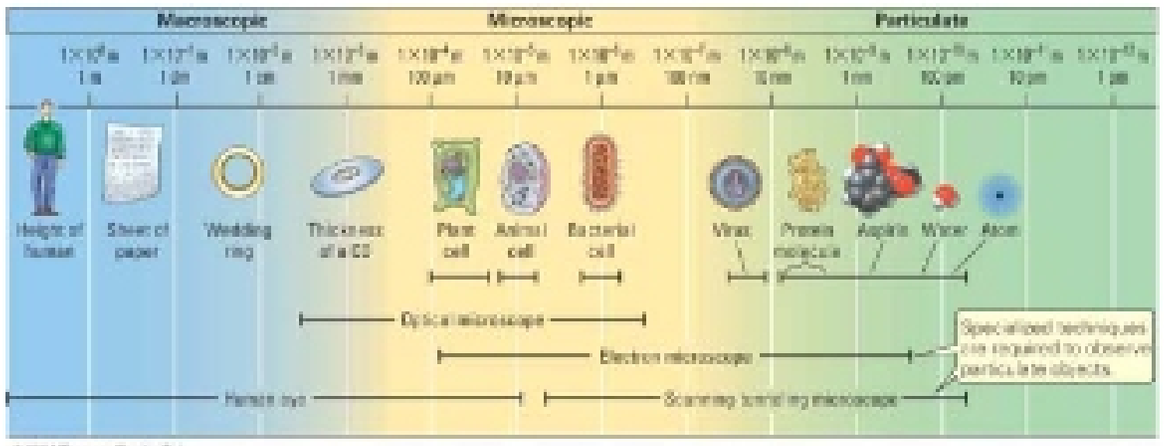
Chapter 1

Chemistry in Our Lives

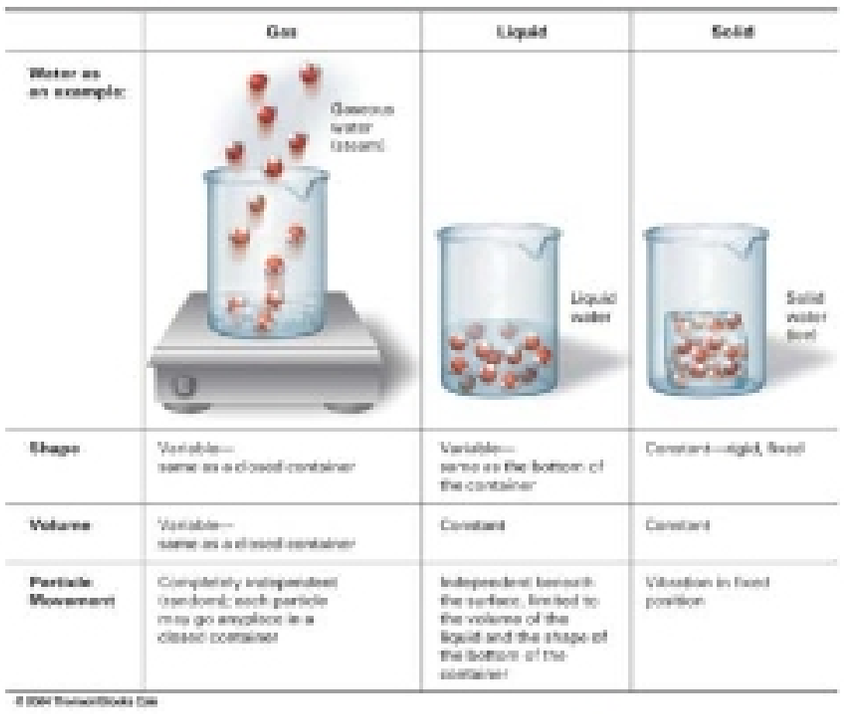
Matter

- ***Matter*** is any substance that has mass and takes up space (occupies volume).
  - **Macroscopic** matter is matter that can be easily observed with the unaided human eye
  - **Microscopic** matter is matter too small to be seen with the unaided human eye.
  - **Particulate** matter is matter too small even to be seen with an optical microscope.



States of Matter

- Matter exists in one of three states: **Gas, Liquid or Solid**
- The differences among these states can be explained in terms of the **Kinetic Molecular Theory**



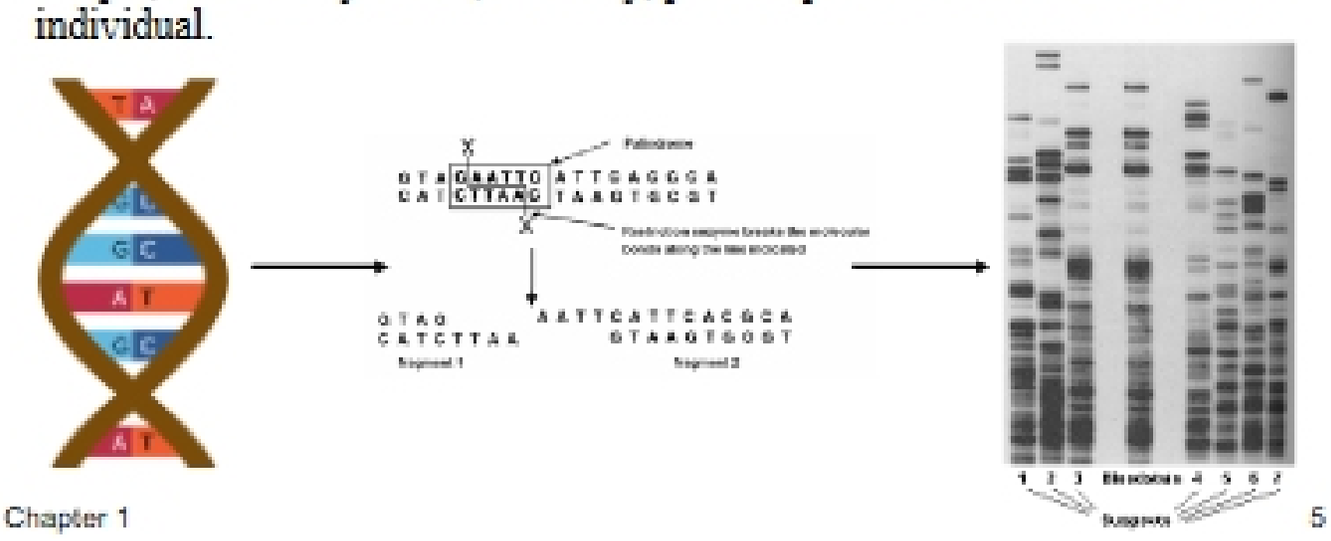
Can you think of another state of matter?

Physical Properties & Changes

- A ***physical property*** is a characteristic of a pure substance that we can observe without changing its composition.
  - Physical properties include characteristics you can observe with one of your five senses: color, shape, state of matter, appearance, smell, taste
  - Physical properties also include characteristics you cannot observe with one of your five senses: melting and boiling points, viscosity density and conductivity
- A ***physical change*** is a change where the chemical composition of the substance remains unchanged.
  - These include changes in physical state or shape of a pure substance.
  - An example would be liquid freezing to a solid

The Ultimate Physical Property: DNA

- **Forensic Science** focuses on the examination of physical evidence in an effort to identify some fact, object or individual.
- The physical characteristics of an individual are governed by their genetic information stored in their DNA (DeoxyriboNucleic Acid).
- Because every person's DNA (aside from identical twins) is thought to be unique, DNA analysis can, in theory, provide positive identification of an individual.



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Chemical Properties & Changes

- A ***chemical property*** describes the chemical reactions of a pure substance.
  - Chemical properties cannot be observed and include reactions with other chemical entities.
- A ***chemical change*** indicates that a chemical reaction has occurred resulting in the formation of a new compound with a new set of physical and chemical properties.
  - The composition of the substances changes during a chemical change.
  - An example would be the ripening of a banana or burning wood

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