4.3 Changes in Matter
Student Notes (p.122-126)

Learning Outcomes
- How the particle model of matter explains the states and changes of matter

Why Is It Important
- You and all the materials in living things in the world are made of matter

Skills you will use in this chapter
- Investigate properties and changes of matter

Physical Change:
A change in matter in which the identity remains the same.
A material may change its shape or its state- but it keeps its identity.

Examples
Paper- a flat, smooth piece of lined paper gets crumpled into a ball.
Metal- if you heat a metal it becomes more malleable so it can be bent into a different shape.

Investigation 4-F: Name the Change p. 123
Complete #1-4 in notebook (#1 Diagram, #2 and #3 Draw and Complete Table, #4 Complete Statements)

How Can You Explain Physical Changes of Matter

- **The Particle Model of Matter**: the scientific description of many different features of matter.

Here are the key points of this model:
- All matter is made up of tiny particles that are much too small to be seen.
- The particles are always in motion. They vibrate, rotate, and (in liquid and gases) move from place to place.
- The particles have empty spaces between them. There is a lot of empty space between the particles of a gas. There is very little empty space between the particles in a solid and between the particles of a liquid.
- Particles at higher temperature are moving faster than particles at a lower temperature.
- Each pure substance has its own kind of particle, which is different from the kinds of particles that make up other pure substances.

Changes of state occur when a material is heated or cooled.
Changes of state are reversible changes.

Complete the third and final column of the States of Matter Placemat. Use the diagrams on page 124.

Other Ways That Matter Can Change

Chemical change: one type of matter changes to produce one or more different types of matter. The matter that is produced has a different identity and different properties from the original matter.

Example: Burning paper- changes the identity of the paper. Ashes and smoke aren't same type of matter as the original paper. This change is non-reversible.

Chemical property: the ability of a material to take part in a chemical change. Chemical properties describe how one type of matter interacts with other types of matter, or with energy, during a chemical change.