McGraw-Hill Ryerson

BC Science Connections 8

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UNIT 2

The behaviour of matter can be explained by the kinetic molecular theory and atomic theory

TOPIC 2.1

How does matter affect your life?

Topic 2.1: How does matter affect your life?

- What does the word "chemical" mean to you?
  - Chemicals are not necessarily dangerous
  - "Chemical" means the same as "matter"

Concept 1: Everything—including you—is made up of chemicals.

- You are made up of mostly four types of chemicals called elements:
  - Oxygen
  - Carbon
  - Hydrogen
  - Nitrogen

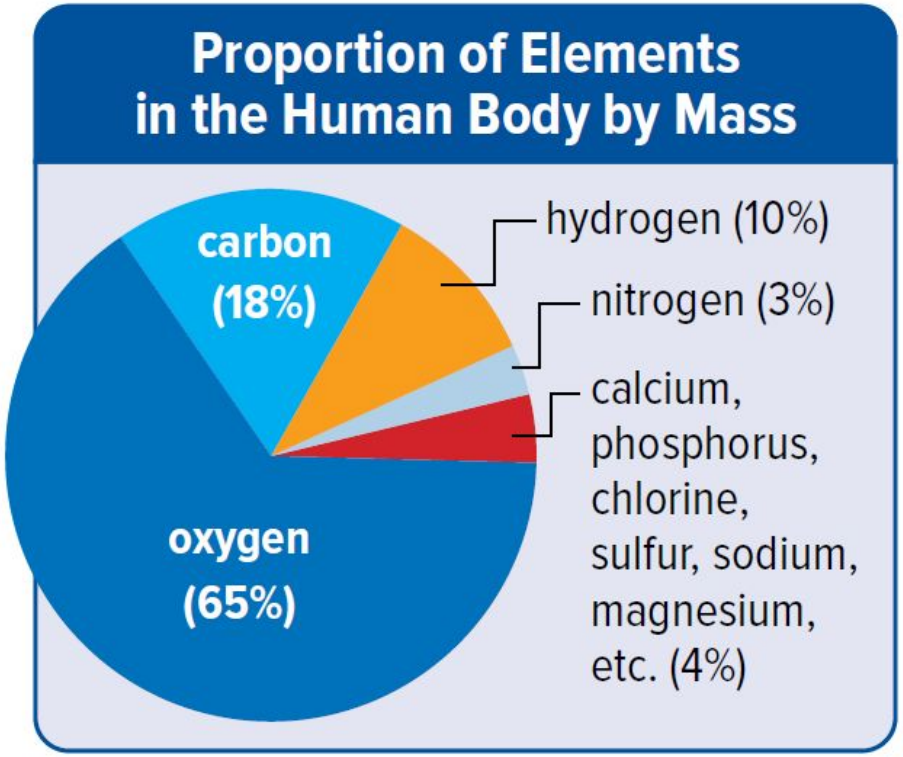


Figure 2.1 Where do we get the chemicals we need for our bodies?

Concept 1: Everything—including you—is made up of chemicals.

- When people use the word "chemical", they are talking about "matter"
  - **Matter**: anything that takes up space and mass

Everything is made up of matter.

Discussion Questions

- In your own words, define the term “matter.”

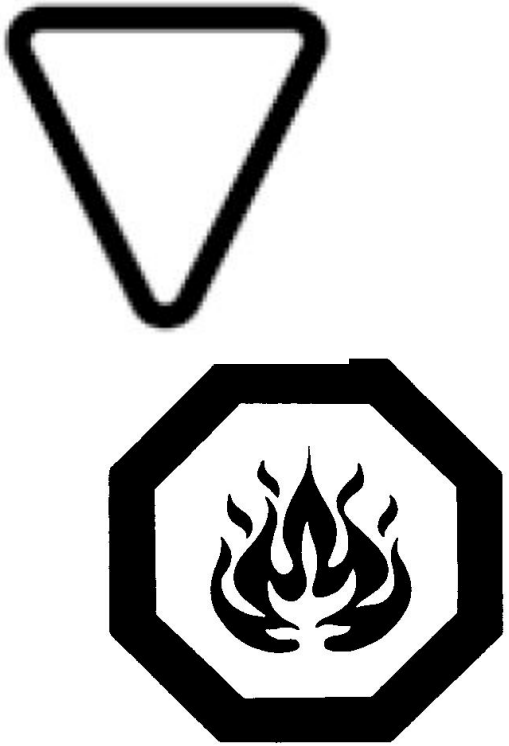
- What kinds of misunderstanding can result when people use the word “chemical” when talking about issues involving health and the environment?

Concept 2: Chemicals in your daily life have characteristics that make them useful, hazardous, or both.

- Some types of matter that you use everyday can be hazardous
  - Information labels give you information about how to properly handle matter

Chemical Safety Around the House

- **Hazardous Household Products Symbols (HHPS)**
  - Each symbol has two types of warnings:
    - Whether the hazard is the container or contents
    - The type of hazard



HHPS: The Borders

- **Dangerous Container**
  - Border looks like a traffic yield sign
  - Container is dangerous

HHPS: The Borders

- **Dangerous Product**
  - Border looks like a traffic stop sign
  - Contents of the container are dangerous

HHPS: The Hazards

- **Explosive**
  - Container can explode
  - If punctured or heated, pieces can cause serious injuries

HHPS: The Hazards

- **Corrosive**
  - Product inside the container will burn the throat or stomach if swallowed
  - Burn skin or eyes or contact

HHPS: The Hazards

- **Flammable**
  - Product will catch on fire easily if near sparks, flames, or heat

HHPS: The Hazards

- **Poisonous**
  - Product will cause illness or death if you eat or drink it
  - Smelling or licking the product may be enough to cause harm

HHPS: Household Hazardous Product Symbols

Figure 2.2 Household hazardous product symbols (HHPS).

Name two products with HHPS on their containers.

Discussion Questions

- What is the HHPS system? Why is it used?

- Which HHPS would be on spray paint?

Concept 3: Handling chemicals and equipment safely is important at school and at work.

- By law, everyone in the workplace, including school, must:
  - Know about the chemicals they use
  - Know how to handle the chemicals safely

- Canada: Workplace Hazardous Materials Information System (WHMIS)

WHMIS: Workplace Hazardous Materials Information System

- WHMIS:
  - Provides information about how to store, handle, and dispose of chemicals
  - Also provides first aid information

WHMIS 2015

WHMIS Symbol	Description
	**Exploding bomb** (explosion and reactivity hazards)
	**Gas cylinder** (gases under pressure)

WHMIS 2015

WHMIS Symbol	Description
	**Health hazard** (may cause or is suspected of causing serious health effects)
	**Flame** (fire hazards)

WHMIS 2015

WHMIS Symbol	Description
	**Corrosion** (corrosive damage to metals, as well as skin, eyes)
	**Exclamation mark** (may cause less serious health effects or damage the ozone layer)

WHMIS 2015

WHMIS Symbol	Description
	**Flame over circle** (oxidizing hazards)
	**Skull and crossbones** (can cause death or toxicity with short exposure to small amounts)

WHMIS 2015

WHMIS Symbol	Description
	**Biohazardous infectious materials** (organisms or toxins that can cause disease in people or animals)

WHMIS 2015

 **Exploding bomb** (for explosion or reactivity hazards)	 **Flame** (for fire hazards)	 **Flame over circle** (for oxidizing hazards)
 **Gas cylinder** (for gases under pressure)	 **Corrosion** (for corrosive damage to metals, as well as skin, eyes)	 **Skull and Crossbones** (can cause death or toxicity with short exposure to small amounts)
 **Health hazard** (may cause or is suspected of causing serious health effects)	 **Exclamation mark** (may cause less serious health effects or damage the ozone layer)	 **Biohazardous infectious materials** (for organisms or toxins that can cause disease in people or animals)

Figure 2.3: WHMIS 2015 safety symbols.

Which WHMIS symbols would you find on a container that contains a flammable gas stored under pressure?

Discussion Questions

- What is WHMIS and what role does it play in laboratory safety?

- Why is it important to have a common set of safety labels and icons for hazardous chemicals in all workplaces and schools?

Summary: How does matter affect your life?

- Everything—including you—is made up of chemicals.
- Chemicals in your daily life have characteristics that make them useful, hazardous, or both.
- Handling chemicals and equipment safely is important at school and at work.