

McGraw-Hill Ryerson

**BC Science
CONNECTIONS**

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BC Science Connections 8

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

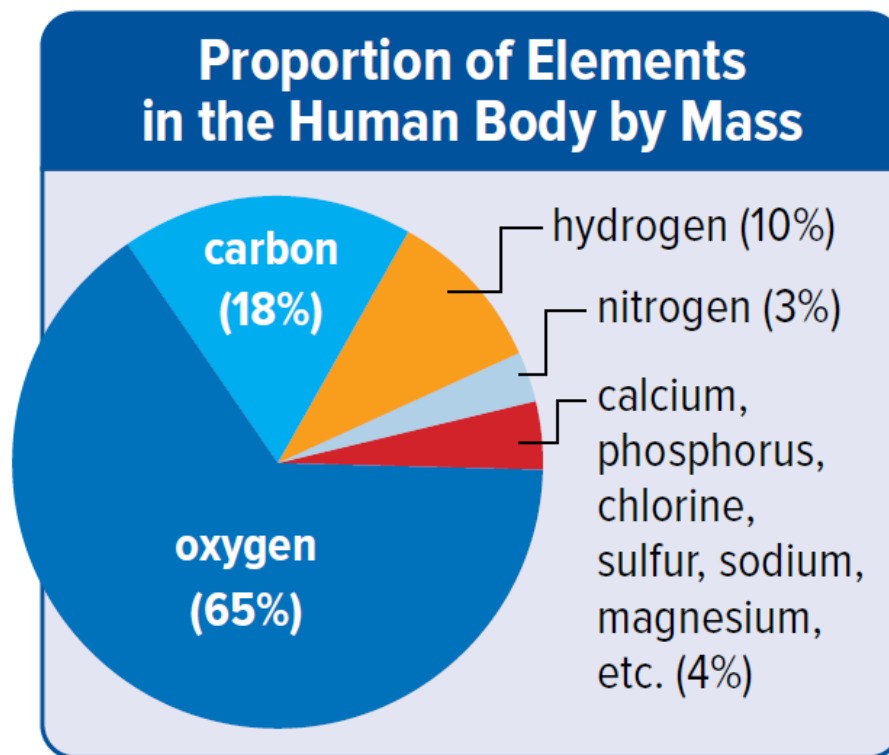


Figure 2.1 Where do we get the chemicals we need for our bodies?

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



Brainstorm

Brainstorm objects in your household that could be hazardous.



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



Think of a memory device/connection that will help you remember the difference between these borders.

HHPS: The Hazards

- **Explosive**
 - Container can explode
 - If punctured or heater, 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

The Borders



Dangerous Container
The border that looks like a traffic yield sign means that the container is dangerous.



Dangerous Product
The border that looks like a traffic stop sign means that the contents of the container are dangerous.

The Hazards



Explosive
This symbol means that the container can explode. If it is punctured or heated, pieces can cause serious injuries, especially to the eyes.



Corrosive
This symbol means that the product inside the container will burn the throat or stomach if swallowed and will burn skin or eyes on contact.



Flammable
This symbol means that the product will catch on fire easily if it is near sparks, flames, or even heat.



Poisonous
This symbol means that the product will cause illness or death if you eat or drink it. For some products, just smelling or licking them is enough to cause serious harm.

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
	<p>Explosion hazard (explosion and reactivity hazards)</p>
	<p>Gas cylinder (gases under pressure)</p>



WHMIS 2015

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


WHMIS 2015

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

WHMIS 2015

WHMIS Symbol	Description
 A black flame over a circle symbol, representing oxidizing hazards, enclosed in a red diamond border.	Flame over circle (oxidizing hazards)
 A black skull and crossbones symbol, representing acute toxicity, enclosed in a red diamond border.	Skull and crossbones (can cause death or toxicity with short exposure to small amounts)

WHMIS 2015

WHMIS Symbol	Description
	<p>Biohazardous infectious materials (organisms or toxins that can cause disease in people or animals)</p>

WHMIS 2015










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

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.

