

# SNC1D CHEMISTRY

ATOMS, ELEMENTS, & COMPOUNDS

☞ Safety in Science  
(P.xxvi-xxix)

---

---

---

---

---

---

---

---

## Activity: Safety in Science (Part 1)

### INSTRUCTIONS

- A. Watch the video "Science Safety."
- B. Identify the equipment being used.
- C. Place your answers on 1DCHEM - WS#1 (Lab Equipment).

---

---

---

---

---

---

---

---

## Safety in Science

*Do you know who is responsible for your safety in and out of a science laboratory? You are. Everyone who shares the same classroom – your teacher and classmates – share the responsibility as well as the risks. It is vitally important that you, and the people who are working with you, take safety information seriously and follow safety precautions precisely.*



---

---

---

---

---


---

---

---

**Safety in Science**

*Matter includes both helpful and harmful solids, liquids, and gases. For example, oxygen is a gas that all animals must take in to survive, but nitrogen dioxide gas from car exhaust is poisonous. How do we know whether or not a given substance is safe to use? How do we work safely with any chemical in the laboratory, at home, or at work?*



February 9, 2013      1DCHEM - Safety in Science      3

---

---

---

---

---

---

---

---

---


---

**Safety in Science**

*One source of information about hazardous substances is the warning symbols that are placed on containers of potentially dangerous materials.*

**HAZARDOUS CHEMICALS**

- ✦ can be:
  - poisonous (toxic)
  - flammable
  - explosive
  - corrosive (reactive)



February 9, 2013      1DCHEM - Safety in Science      4

---

---

---

---

---

---

---

---

---

---

**Safety in Science**

**PRACTICE**

1. How can hazardous chemicals enter your body? (5 ways)

- inhalation
- ingestion
- injection
- skin contact
- eye contact



February 9, 2013      1DCHEM - Safety in Science      5

---

---

---

---

---

---

---

---

---

---

### Safety in Science – HHPS

The **Hazardous Household Products Symbols (HHPS)** on consumer products specify both the nature and the degree of any hazard. Each symbol is made up of a picture and a frame. The picture tells you the type of danger. The frame tells you whether it is the contents (octagon) or the container (triangle) that poses that hazard.

	poisonous	flammable	explosive	corrosive
danger				
warning				
caution				

February 9, 2013 IDCHEM - Safety in Science 6

---

---

---

---

---

---

---

---

---

---

### Safety in Science – WHMIS

The **Workplace Hazardous Materials Information System (WHMIS)** provides workers and students with complete and accurate information about hazardous products. Clear and standardized labels must be present on the product's container. If the material is hazardous, the label will include one or more of the following WHMIS symbols.

	compressed gas		dangerously reactive material
	flammable and combustible material		biohazardous infectious material
	oxidizing material		poisonous and infectious material causing immediate and serious toxic effects
	corrosive material		poisonous and infectious material causing other toxic effects

February 9, 2013 IDCHEM - Safety in Science 7

---

---

---

---

---

---

---

---

---

---

### Safety in Science – MSDS

In Canada, manufacturers of all hazardous products used in workplaces, including schools, must provide information sheets about their products. The **Material Safety Data Sheets (MSDS)** identifies the chemical and physical hazards associated with each substance. It also includes physical data, toxicity, health effects, first aid, and spill cleanup procedures.

NFPA Classification				DOT / TDG Pictogram		WHMIS Classification		PROTECTIVE CLOTHING	
<b>Section 1. Chemical Product and Company Identification</b>									
PRODUCT NAME: Sulfuric Acid									
SYNONYM: Oil of vitriol, Dipping acid, Sulphuric acid					MSDS NUMBER:				
CHEMICAL NAME: Sulfuric acid					REVISION NUMBER:				
CHEMICAL FAMILY: Inorganic acid					MSDS prepared by the Environment, Health and Safety Department on:				
CHEMICAL FORMULA: H <sub>2</sub> SO <sub>4</sub>					24 HR EMERGENCY TELEPHONE NUMBER:				
MATERIAL USES: Agricultural use; Manufacture of chemical products; Industrial applications; Manufacture of inorganic products.									

February 9, 2013 IDCHEM - Safety in Science 8

---

---

---

---

---


---

---

---

---

---

 Safety in Science

**SAFETY SYMBOLS (P.513)**

- ❖ indicate why and to what degree a product is dangerous
- ❖ variety of symbols

- ① HHPS ☞ Hazardous Household Product Symbols
- ② WHMIS ☞ Workplace Hazardous Materials Information System
- ③ MSDS ☞ Materials Safety Data Sheet

February 9, 2013 1DCHEM - Safety in Science 9

---

---

---


---

---

---

---

---

 Safety in Science

**PRACTICE**

2. Why is it important to standardize safety symbols?

so people will know exactly why and to what degree a product is dangerous

February 9, 2013 1DCHEM - Safety in Science 10

---

---

---


---

---

---

---

---

 Safety in Science

**PRACTICE**

3. Which of the two warning systems do you think is more effective?

answers will vary

February 9, 2013 1DCHEM - Safety in Science 11

---

---

---


---

---

---

---

---

 Safety in Science

**PRACTICE**

4. Briefly describe the procedure to follow if:

- (a) exposed skin comes in contact with any chemical substance.
- (b) chemicals accidentally splash in your eyes.

(a) wash the exposed area with plenty of water  
(b) flush your eyes with plenty of water (from the inside out)

February 9, 2013      1DCHEM - Safety in Science      12

---

---

---


---

---

---

---

---

 Safety in Science

**PRACTICE**

5. Do you think it is always safe to pour waste chemicals and solutions down the sink with lots of water? Explain.

no because most of these chemicals are toxic and can harm the aquatic ecosystem (and us eventually)

February 9, 2013      1DCHEM - Safety in Science      13

---

---

---


---

---

---

---

---

 Safety in Science

**PRACTICE**

6. Think about safety precautions that are taken in different industries.

- (a) Why do people wear face masks when spraying a car?
- (b) Why do hairdressers wear gloves when using chemicals to straighten hair?
- (c) Why do firefighters wear breathing apparatus when entering a burning building?

(a) to prevent inhalation of dangerous fumes/particles  
(b) to prevent skin contact with dangerous chemicals  
(c) to prevent inhalation of dangerous fumes/particles

February 9, 2013      1DCHEM - Safety in Science      14

---

---

---


---

---

---

---

---

 **Activity: Safety in Science (Part 2)**

**INSTRUCTIONS**

A. Your teacher will supply you with various containers of products. Examine the containers for hazardous product symbols.

B. Make a table to summarize your findings, with the following headings:

Brand Name	Type of Product	Type of Container	Hazard Symbol

February 9, 2013      1DCHEM - Safety in Science      15

---

---

---

---

---

---

---


---

---

---

---

---

 **Activity: Safety in Science (Part 2)**

**QUESTIONS**

- Do you see any similarities in the types of containers that are used for hazardous materials? Explain.
- Do you see any similarities in the types of hazards that seem to be associated with particular groups of products? Explain.

February 9, 2013      1DCHEM - Safety in Science      16

---

---

---

---

---

---

---


---

---



---

---

---

 **✓ Check Your Learning**

**WIKI (CHEMISTRY)**

-  1DCHEM - WS#2 (Safety In Science)
-  1DCHEM - QUIZ#1 (Lab Safety & Equipment)

February 9, 2013      1DCHEM - Safety in Science      17

---

---

---

---

---

---

---

---

---

---

---

---