Science 10

Unit A: Energy and matter in chemical change

Acid and base safety

Household chemicals

- A window cleaner and a drain opener can both look like clear liquids, but their particles, pH, and hazards can be very different.
- A chemical with a familiar household use can still cause harm; concentration, exposure route, and amount all matter.
- Before use, read the product label and safety data sheet. To identify a chemical, use its label and safety data sheet; colour and smell are unreliable.

pH and other hazards

- A solution with pH below 7 is acidic, and a solution above 7 is basic.
- pH leaves out other hazards printed on the label.
- A conducting solution contains mobile charged particles, so conductivity helps you classify it; naming the exact chemical takes more tests.
- A corrosive pictogram or hazard statement changes how a product is handled, stored, and cleaned up.

Key terms

acid

A substance that produces hydronium ions in water in the Grade 10 model.

base

A substance that produces hydroxide ions or accepts protons in the Grade 10 model.

pH

Logarithmic measure related to hydronium-ion concentration in an aqueous solution.

conductivity

Ability of a material or solution to carry electric current.

Key terms

Workplace Hazardous Materials Information System (WHMIS)

Canadian system for communicating workplace chemical hazards through labels, pictograms, and safety data sheets.

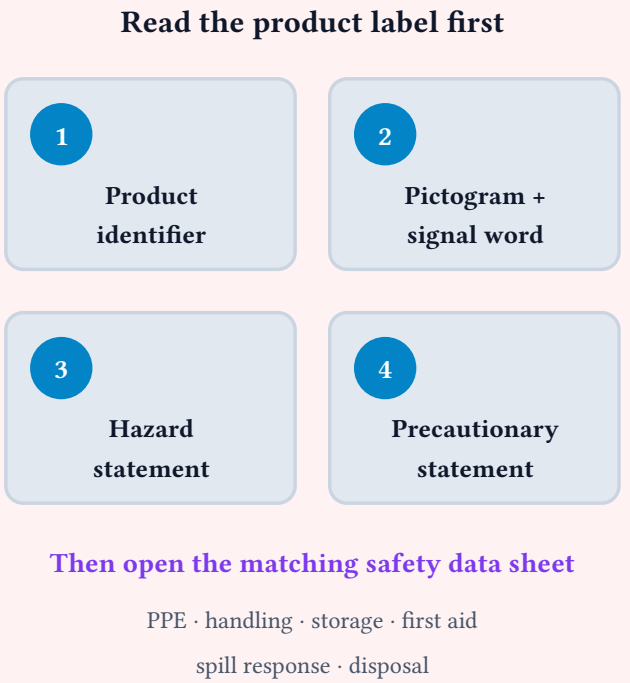
safety data sheet

Document describing a product's hazards, handling, storage, emergency, and disposal information.

Safety

Safety gate before chemical testing

- Identify the product and teacher-approved procedure before opening or testing a chemical.
- Read the container label first; use the safety data sheet for protective equipment, storage, first aid, spill response, and disposal.
- If the label, container, or conditions differ from the approved procedure, stop and notify the teacher.



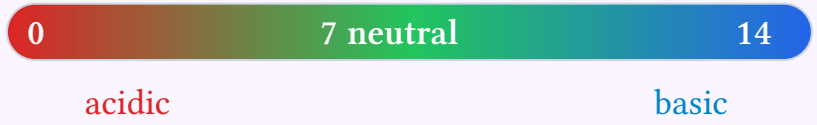
Classifying solutions by pH

- Hydrochloric acid, HCl(aq), has pH below 7 and conducts because ions are present after ionization in water.
- Sodium hydroxide, NaOH(aq), has pH above 7 and conducts because the ionic solid dissociates into mobile ions.
- Sodium chloride, NaCl(aq), can conduct while remaining near neutral, so pH is the test that decides acid or base.



pH scale

- The midpoint of the classroom pH scale is 7. Acids sit below it, and bases sit above it.
- To decide how dangerous a bottle is, use the label and safety data sheet. The pH number is only one clue.
- Concentration, the amount you have, and the safety data sheet still decide how you handle it.



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Societal hazards

- Hazard depends on the substance, its concentration, and how someone is exposed.
- A strong acid and a concentrated solution are two separate descriptions.
- Labels and safety data sheets say how to store, handle, and dispose of a product.
- Alcohol, nicotine, heavy metals, strong acids, and flammable gases each need their own procedure.

Classifying three evidence cards

- Sample A: pH 2, high conductivity, clear solution: classify the aqueous behaviour and state the evidence.
- Sample B: pH 7, high conductivity, clear solution: explain why pH decides acid or base, while conductivity only shows that ions are present.
- Sample C: pH 11, low but measurable conductivity: classify the aqueous behaviour without guessing the product identity.

Acid and base safety

- Classify a conducting solution with pH 2 using the Grade 10 acid/base model.
- Explain what you need besides pH to judge whether a product is safe to handle.
- Name the two product-specific sources to consult before using a classroom chemical.

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