

Processing Chemical Reactions

Alberta & Nunavut	
Topic C: Grade 5	
Classroom Chemistry	
<u>General Learner Expectations:</u>	5–7 Describe the properties and interactions of various household liquids and solids, and interpret their interactions.
<u>Specific Learner Expectations:</u>	<p>2. Apply and evaluate a variety of techniques for separating different materials.</p> <p>8. Recognize and describe evidence of a chemical reaction. Explain how the products of a reaction differ from the original substances.</p> <p>9. Use an indicator to identify a solution as being acidic or basic.</p>
General Outcomes	
<u>General Learner Expectations:</u>	<p>5–1 Design and carry out an investigation, using procedures that provide a fair test of the question being investigated</p> <p>5–2 Recognize the importance of accuracy in observation and measurement; and, with guidance, apply suitable methods to record, compile, interpret and evaluate observations and measurements.</p> <p>5–4 Demonstrate positive attitudes for the study of science and for the application of science in responsible ways.</p>
Grade 8	
Unit A: Mix and Flow of Matter	
<u>Specific Outcomes:</u>	<p>2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution</p> <ul style="list-style-type: none"> • distinguish among pure substances, mixtures and solutions, using common examples (e.g., identify examples found in households) <p>4. Identify, interpret and apply technologies based on properties of fluids</p> <ul style="list-style-type: none"> • describe technologies based on the solubility of materials (e.g., mining salt or potash by dissolving)

General Outcomes

Skills Outcomes:

Ask questions about the relationships between and among observable variables, and plan investigations to address those questions

- define practical problems
- identify questions to investigate, arising from practical problems and issues
- design an experiment, and identify the major variables

Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data

- carry out procedures, controlling the major variables
- use instruments effectively and accurately for collecting data
- use tools and apparatus safely

Analyze qualitative and quantitative data, and develop and assess possible explanations

- identify new questions and problems that arise from what was learned
- identify and evaluate potential applications of findings

Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results

- work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise

Attitude Outcomes:

- Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields
- Work collaboratively in carrying out investigations and in generating and evaluating ideas
- Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment
- Show concern for safety in planning, carrying out and reviewing activities

Grade 9	
Unit B: Matter and Chemical Changes	
<u>Specific Outcomes:</u>	<p>1. Investigate materials, and describe them in terms of their physical and chemical properties</p> <ul style="list-style-type: none"> • identify conditions under which properties of a material are changed, and critically evaluate if a new substance has been produced
General Outcomes	
<u>Skills Outcomes:</u>	<p>Ask questions about the relationships between and among observable variables, and plan investigations to address those questions</p> <ul style="list-style-type: none"> • identify questions to investigate • select appropriate methods and tools for collecting data and information and for solving problems <p>Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data</p> <ul style="list-style-type: none"> • carry out procedures, controlling the major variables • observe and record data, and prepare simple drawings • demonstrate knowledge of WHMIS standards, by using proper techniques for handling and disposing of laboratory materials <p>Analyze qualitative and quantitative data, and develop and assess possible explanations</p> <ul style="list-style-type: none"> • identify new questions and problems that arise from what was learned <p>Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results</p> <ul style="list-style-type: none"> • receive, understand and act on the ideas of others
<u>Attitude Outcomes:</u>	<ul style="list-style-type: none"> • Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields • Work collaboratively in carrying out investigations and in generating and evaluating ideas • Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment • Show concern for safety in planning, carrying out and reviewing activities

Grade 10	
Unit A: Energy and Matter in Chemical Change	
<u>Specific Outcomes:</u>	<p>3. Identify and classify chemical changes, and write word and balanced chemical equations for significant chemical reactions, as applications of Lavoisier's law of conservation of mass</p> <ul style="list-style-type: none"> • describe the evidence for chemical changes; i.e., energy change, formation of a gas or precipitate, colour or odour change, change in temperature
General Outcomes	
<u>Skills Outcomes:</u>	<p>Ask questions about observed relationships, and plan investigations of questions, ideas, problems and issues</p> <ul style="list-style-type: none"> • define and delimit problems to facilitate investigation • evaluate and select appropriate instruments for collecting evidence and appropriate processes for problem solving, inquiring and decision making <p>Conduct investigations into relationships between and among observable variables, and use a broad range of tools and techniques to gather and record data and information</p> <ul style="list-style-type: none"> • carry out procedures, controlling the major variables and adapting or extending procedures • demonstrate a knowledge of WHMIS standards by selecting and applying proper techniques for the handling and disposal of laboratory materials • select and use apparatus, technology and materials safely (<p>Work as members of a team in addressing problems, and apply the skills and conventions of science in communicating information and ideas and in assessing results</p> <ul style="list-style-type: none"> • communicate questions, ideas and intentions; and receive, interpret, understand, support and respond to the ideas of others
<u>Attitude Outcomes:</u>	<ul style="list-style-type: none"> • Show interest in science-related questions and issues, and confidently pursue personal interests and career possibilities within science-related fields • Work collaboratively in planning and carrying out investigations, as well as in generating and evaluating ideas • Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment • Show concern for safety in planning, carrying out and reviewing activities