Processing Chemical Reactions

Northwest Territories	
Grade 5	
Properties of and Changes in Matter	
General Curriculum Outcomes:	Investigate common changes of state (e.g., melting, freezing, condensing, evaporating) and make informed choices about materials when finding solutions to problems in designing and constructing objects based on their understanding of the states of matter. Identify the properties that make different materials useful in everyday products and discuss the environmental impact of their use.
Specific Curriculum Outcomes:	Describe examples of interactions between materials that result in the production of a gas (e.g., antacid tablets in water, baking soda in vinegar). Identify the three different states of matter (solid, liquid, and gas) and give examples of each state (e.g., solid: sugar, rock; liquid: water, vegetable oil; gases: water vapour, air, oxygen). Describe the characteristic properties of each of the three states of matter based on their properties (e.g., solids have definite shape and volume and hold their shape; liquids have definite volume but take the shape of their containers; gases have no definite volume and take the shape of their container). Use appropriate vocabulary, including correct science and technology terms, in describing their investigations and observations (e.g., use terms such as hardness, colour, luster, and texture when discussing the physical properties of rocks and minerals). Plan investigations for some of these answers and solutions, identifying variables that need to be held constant to ensure a fair test and identifying criteria for assessing solutions. Compile data gathered through investigation in order to record and present results, using tally charts, tables, and labeled graphs produced by hand or with a computer (e.g., record the reaction of different materials when vinegar is dropped on them and use a data table to represent their findings).

	Communicate the procedures and results in investigations for specific purposes and to specific audiences using electronic media, oral presentations, written notes and descriptions, drawings and charts (e.g., make accurate and detailed drawings of sugar crystals, as seen by the unaided eye and under a microscope). Identify the sources of natural and manufactured materials found in a product (e.g., plastic is made from petroleum products, down comes from ducks and geese) and describe the steps required to modify the natural materials to make the new product;

Grade 8	
Unit A: Mix and Flow of Matter	
Specific Outcomes:	2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution • distinguish among pure substances, mixtures and solutions, using common examples (e.g., identify examples found in households) 4. Identify, interpret and apply technologies based on properties of fluids • 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	
Specific Outcomes:	1. Investigate materials, and describe them in terms of their physical and chemical properties • identify conditions under which properties of a material are changed, and critically evaluate if a new substance has been produced
General Outcomes	
Skills Outcomes:	Ask questions about the relationships between and among observable variables, and plan investigations to address those questions • identify questions to investigate • select appropriate methods and tools for collecting data and information and for solving problems Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data • 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 Analyze qualitative and quantitative data, and develop and assess possible explanations • identify new questions and problems that arise from what was learned Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results • receive, understand and act on the ideas of others
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 10	
Unit A: Energy and Matter in Chemical Change	
Specific Outcomes:	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 • 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	
Skills Outcomes:	Ask questions about observed relationships, and plan investigations of questions, ideas, problems and issues • 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 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 • 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 (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 • communicate questions, ideas and intentions; and receive, interpret, understand, support and respond to the ideas of others
Attitude Outcomes:	• 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