

## Curricular Connections Grade 8

### Exploring Opimihaw Creek

#### *Science Grade 8*

#### Earth and Space Science: Water Systems on Earth (WS)

**WS8.1 Analyze the impact of natural and human-induced changes to the characteristics and distribution of water in local, regional, and national ecosystems.**

- a. Construct visual representations of the world distribution of water, and the distribution of water in Saskatchewan, including watersheds, lakes, rivers, streams, river systems, wetlands, ground water, saline lakes, and riparian areas.
- b. Compare physical characteristics of surface water features, such as lakes, rivers, streams, wetlands, and riparian areas.
- c. Examine the significance of water to First Nations and Métis people of Saskatchewan, including water as an essential element of life, transportation, water quality, fishing practices, and treaty rights regarding fishing.
- d. Apply the concept of systems as a tool for interpreting the structure and interactions of water systems by constructing representations of systems such as the water cycle, watersheds, and continental drainage basins and showing interrelationships between parts of the system.
- e. Construct a written, visual, or dramatic representation of the water cycle, including showing or explaining how a single particle of water can travel through the cycle over extended periods of time.
- f. Identify possible personal, societal, economic, and environmental consequences of natural changes and human practices and technologies that pose threats to surface and/or ground water systems in Saskatchewan (e.g., vegetation removal, water and sewage treatment plants, timber harvesting, over-application of fertilizers, agricultural and urban irrigation, impervious ground cover, land alterations, mining, introduction of invasive species, shoreline erosion, fluctuating lake levels, flooding, draining and/or channelling of surface water features, and damming of rivers).
- g. Research a specific human practice or technology that may

pose a threat to surface and/or groundwater systems in Saskatchewan and explain how different groups in society (e.g., landowner, consumer, business owner, recreational user, fisherman, government official, and farmer) may have conflicting needs and desires in relation to the practice or technology and how those decisions or actions of different stakeholders may or may not be addressed by scientific or technological knowledge.

h. Evaluate individual and group processes used in planning, problem solving, decision making, and completing a task related to studying threats to water systems, such as accepting various roles in a group, sharing responsibility for carrying out decisions, and seeking consensus before making decisions.

**WS8.2 Examine how wind, water, and ice have shaped and continue to shape the Canadian landscape.**

a. Explain how the processes of weathering, erosion, and deposition result from water movement and wave action, including how waves and tides are generated and how they interact with shorelines.

b. Plan and conduct a simulation to demonstrate how temperature differences cause water currents.

c. Explain the meaning and significance of the forces that shape the landscape to First Nations and Métis people.

d. Describe how the interactions of ocean currents, winds, and regional climates shape local, regional, national, and global environments.

e. Critique the design and function of technologies designed to minimize damage due to waves and tides (e.g., piers, breakwaters, dune vegetation, and coastline reconfiguration) in oceans and in-land water bodies.

f. Create a written, visual, physical, or dramatic representation of the processes that lead to the development of rivers, lakes, continental drainage systems, and ocean basins, including glaciation, continental drift, erosion, and volcanic action.

g. Relate factors that affect glacier formation and reduction and their effects on the environment to the formation of glacial landforms in Saskatchewan (e.g., drumlins, moraines, eskers, and kettle lakes).

h. Identify factors that affect polar icecap formation and reduction and their effects on the environment, including

possible changes to ocean currents and climate patterns.

i. Propose new questions and problems for future study that arise from the study of the effects of wind, water, and ice on the landscape (e.g., "How might changes in glaciers affect Saskatchewan water supplies?" "How might icecap melting change Canadian coastlines?").

**WS8.3 Analyze natural factors and human practices that affect productivity and species distribution in marine and fresh water environments.**

a. Examine the ways in which First Nations and Métis people traditionally valued, depended upon, and cared for aquatic wildlife and plants in Saskatchewan and Canada.

b. Identify diverse examples of organisms in a variety of marine and freshwater ecosystems (e.g., wetlands, lakes, rivers, salt marsh, estuary, ocean, and intertidal zone) and explain how biodiversity is an indicator of ecosystem health.

c. Identify factors that affect productivity and species distribution in aquatic environments (e.g., temperature, turbidity, sunlight, nutrients, salinity, water depth, currents, overfishing, upwelling, and pollutants).

d. Research a student-selected aquatic species, describe the characteristics of its environment, identify factors that could affect its productivity, and suggest methods of ensuring longterm viability of the species.

e. Measure factors that provide indicators of water quality, such as temperature, turbidity, dissolved oxygen content, presence of nitrates or phosphates, and macroinvertebrates, from a variety of samples of water.

f. Interpret patterns and trends in water quality data, and infer and explain relationships among the variables.

g. Identify strengths and weaknesses of different methods of collecting and displaying data about water quality.

h. Describe examples of technologies used to assess water quality and how those technologies have changed over time.

i. Provide examples of how individuals and public and private Canadian institutions contribute to the sustainable stewardship of water through traditional knowledge and scientific and technological research and endeavours related to aquatic environments (e.g., marine research institutes, universities, federal and provincial government departments, and ecological groups) and identify possible careers related to the study and stewardship of water.