

Video 3 (Complex interconnections between water users)

This resource is intended for teachers. It outlines how the Alberta WaterPortal’s video *Complex Interconnections between Water Users* aligns with the curriculum presented in Alberta Education’s Programs of Study.

<p>Curriculum Links</p> <p>What courses from Alberta Education’s Program of Studies are applicable to this video?</p>	<ul style="list-style-type: none"> • Grade 8 Science – Freshwater and Saltwater Systems • Grade 9 Science – Environmental chemistry • Science 20 – Unit B – Ecosystems and Population Change • Science 30 – Unit B – Chemistry and the Environment • Social Studies 10 • ENS 115: Resource Management • ENS 1040: Living with the Environment • ENS 1115: Resource Management • ENS 2010: Water Management 1 • ENS 2030: Ecological Economics • ENS 2040: Environmental Health and Safety • ENS 3040: Energy & the Environment • ENS 3110: Integrated Resource Management • ENS 3120: Water management 2 • Sci 9 Environmental Chemistry • Sci 10: Energy Flow in Global Systems
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<p>Key Concepts</p>	<ul style="list-style-type: none"> • Science and technology have both intended and unintended consequences for humans and the environment. • Habitat destruction, reclamation • balancing energy use with sustainable development. • Nuclear, wind, hydro, biomass, tidal, solar, fuel cell and geothermal alternative energy technologies. • Conversion of solar energy, fossil fuels and wind and water power into thermal and electrical energy (<i>science 30 pg. 81</i>) • Food and energy production, and water use is a complex, interconnected system. • There are trade-offs to every decision made within the Water Nexus. Decisions that create benefits for one user group may have negative impacts on another user group.
<p>Objectives</p>	<ul style="list-style-type: none"> • Students will be introduced to the interconnectedness of water, food and energy and begin to understand examples of tangible trade-offs between different water user groups. • Students will look at the impact of water conservation efforts on a local and global scale.
<p>Glossary of Terms</p>	<p>Watershed: An area having a common outlet for its surface water runoff. The land area within a basin/watershed drains water to a single body of water, such as a stream, river, or lake.</p> <p>Headwaters: Upper tributaries of a stream or river, considered the source of that stream/river.</p> <p>Groundwater: Water that is stored underground and is able to flows through porous soil and rocks.</p> <p>Municipal drinking water: Water that is withdrawn from a natural source and treated before it is distributed by an underground pipe network throughout a municipality. This water is</p>

	<p>typically used for drinking, personal hygiene and cleaning.</p> <p>Water Nexus: The interconnected dependence on shared water sources between people, food, energy producers and the environment.</p> <p>Hydro electric dam: A dam that uses flowing water to rotate turbines which create electricity.</p> <p>Turbine: A machine for producing continuous power in which a wheel or rotor is made to revolve by a fast-moving flow of water, steam, gas, air, or other fluid.</p>
<p>Classroom and Online Activity Suggestions</p>	<ul style="list-style-type: none"> • Brainstorm a list of various users within a watershed. Think about how these users might share the same water sources as well as potential trade offs. • Reflect on all the ways we use water on a daily basis in both a direct and indirect manner. • Research how much water is used by each user group within the Bow River. • Research and map out different hydroelectric facilities in the Bow River Watershed. This will help students gain a better understanding of how river levels will be affected in different areas with changes in electric demand. • Create a list of positive outcomes for both water and energy use when a water/energy efficient appliance is used. • Research how much water, energy and money can be saved by using efficient appliances. • Research the risks to aquatic species in Alberta associated with human activities. • Go on a field trip to a hydroelectric dam and have an informational tour from one of the dam operators. • Describe the environmental impact of developing and using various energy sources; i.e., conventional oil, oil sands, solar power, wind power, biomass, hydroelectricity,

	<p>coalburning power, nuclear power, geothermal.*</p> <ul style="list-style-type: none">• Describe artificial and natural factors that affect the biogeochemical cycle. The water cycle for example, including , extraction of ground water, dams for hydro-electricity and irrigation.*• Discuss the use of water by society, the impact such use has on water quality and quantity in ecosystems, and the need for water purification and conservation, considering such things as manufacturing, the oil industry, agricultural systems, the mining industry and domestic daily water consumption.*
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*Indicates Activity was amended from the CBE Program of Studies.