

Lesson #1: Review of Field Study and Discussion of Development Impacts

Time required: One 60-75 minute class period

Setting the Stage	
Topic:	Watershed Activities and Their Impacts
Program of Study Information	<p>Program of Study: Career and Technology Studies Natural Resources Environmental Stewardship Strand</p> <p>Relevant Course(s): ENS 3040: Energy and the Environment</p> <p>Curricular Outcomes: <i>Students will:</i> 1. Describe the social, economic and environmental significance of energy development (Outcomes 1.1-1.4)</p> <p>ENS 3050: Environmental Politics</p> <p>Curricular Outcomes: <i>Students will:</i> 2. analyze challenges in developing, influencing and implementing environmental policies</p> <p>ENS 3910: Project D</p>
Required Materials	<ul style="list-style-type: none"> • Whiteboard or Flipchart Paper for Brainstorming • Markers • Computers for Student Research
Type of lesson	Brainstorm Discussion Research
Word Wall	Social Impacts Economic Impacts Environmental Impacts

Getting Started	
Topic opener “hooks”	<p>Intro/ Hook ideas: How do human actions affect aquatic ecosystems?</p> <ul style="list-style-type: none"> - “How Land and Water are Linked” video: http://www.agr.gc.ca/eng/science-and-innovation/agricultural-practices/water/watershed-protection/agriculture-and-water-quality/how-land-and-water-are-linked-video/?id=1401992196838 - “How Water Gets to Your Home—And Back to the River” video: https://www.youtube.com/watch?v=Msqu4cAQ76U
Lesson Sketch	
Outline	<ol style="list-style-type: none"> 1. Brainstorm Questions: Review the results of the field study. What did we learn about our watershed? 2. Discuss: Human impacts on the environment and local activities that might affect the aquatic ecosystem. <ol style="list-style-type: none"> a. Create a table with the following headings: <i>Urban and Suburban Development, Energy Projects and Resource Extraction, Agriculture</i> b. As a class, in groups or independently have students brainstorm all activities that they know are happening upstream of the field study site and place each activity under one of the headings in your table. If possible, include at least one energy/resource development project.* *Students could be given some time to research these activities if this is considered necessary. c. As a class or in a group, decide which 3-5 activities students believe have the most potential to affect the quality of the water at their field study site. <p>Resources and Links: http://albertawater.com/water-maps-Watershed mapping https://rivers.alberta.ca/ https://www.studentenergy.org : The “Energy Systems Map” provides a graphic representation of renewable and non-renewable energy sources. Can help students understand the various ways that resources are extracted and used. The “Production and Conversion” page provides definitions of various</p>

energy production and conversion methods and includes the potential environmental impacts of these industries

<http://majorprojects.alberta.ca/> - Interactive and up to date map of all major projects in Alberta valued at \$5 million or more. You can use this combined with the watershed map to determine what will affect your aquatic ecosystem. A note about this resource. This is proposed and under construction projects. In order for the project to affect your watershed it would have to be under construction. Even then it would not be the industry itself that is affecting your study site but rather the construction of that project.

<http://seedsconnections.org/energy-literacy-series> - The virtual map in particular will help you to see the ten different kinds of energy development and where in Canada they are being used.

<http://www.greenlearning.ca/programs/> - The programs page has links to lots of information at the provincial and the federal level about a variety of types of development

<http://resources4rethinking.ca/> - An in-depth resource database about sustainable development

d. Once you have listed all of the activities above, brainstorm in a group, as a class, or on your own the potential societal, environmental, and economic impacts of each of the activities and fill in the chart below. You can use the links from above to help you.

Activity/Impact	Societal	Environmental	Economic
1.			
2.			

	3.			
	4.			
	5			
Closing Ideas				
Closing Question for Consideration	<p>Leave students with the following question, with particular attention to be paid the environmental impacts of development:</p> <p><i>Which of the activities that you have listed has the most impact on the aquatic ecosystem that you have studied?</i></p> <p>This is where lesson two will begin.</p>			

Notes: