Lesson # 13: Setting the Stage

Topic:	**Field Study: Review and Reflect**
Science 14 Program of Studies outcome(s): Science, Technology and Society (STS) and Knowledge	Students will: 1. Describe how the flow of matter in the biosphere is cyclical along characteristic pathways and can be disrupted by human activity 2. Analyze a local ecosystem in terms of its biotic and abiotic components, and describe factors of the equilibrium • https://education.alberta.ca/media/3069383/pos_science_14_24.pdf
Skills	Initiating and Planning: Ask questions about relationships between and among observable variables and plan investigations to address those questions • Identify questions to investigate arising from practical problems and issues • Define questions and problems to facilitate investigation Analyzing and Interpreting Analyze qualitative and quantitative data, and develop and assess possible explanations • Identify strengths and weaknesses of different methods of collecting and displaying data apply given criteria for evaluating evidence and sources of information • State a conclusion, based on experimental data; and explain how evidence gathered supports or refutes an initial idea • Identify and evaluate potential applications of findings • Identify new questions and problems that arise from what was learned Communication and Teamwork Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results • Communicate questions, ideas, intentions, plans and results, using lists, notes in point form, sentences, data tables, graphs, drawings, oral language and other means • Evaluate individual and group processes used in planning, problem solving, decision making and completing a task • Defend a given position on an issue or problem, based on their findings

Attitudes	Most of the Attitude Outcomes stated in the Program of Studies are included into each of the *Wading in for Water* lessons. This includes; Interest in Science, Mutual Respect, Scientific Inquiry, Collaboration, Stewardship, and Safety. Please refer to the specific outcomes · https://education.alberta.ca/media/3069383/pos_science_14_24.pdf
Planning ahead	Unit assessment next class
Type of lesson	Wrap up and review class
Word Wall	Listed in Appendix A

Getting Started

Topic opener "hooks"	Intro/ Hook ideas: Question: How many of you have washed your family vehicle/bike/toys/driveway/anything with soap and water outside your home? Where does the water go? Is this different than the drain in your shower? • When water goes down the storm drain, it does go directly into the local river without being treated. This means that soap and other extra dirt is flushed into the river without being cleaned or treated first. Conversely, the water that goes down the shower drain goes to the water treatment plant to get cleaned before being released back into the local river. • Video (1:41): https://emeraldfoundation.ca/aef_awards/yellow-fish-road-2/ • Teacher resource: http://tucanada.org/yellow-fish-road/ Did you know that in many cities, it is a city bylaw that you cannot use soap to wash your vehicle? http://www.calgary.ca/CSPS/ABS/Pages/Frequently-asked-questions/Sewers-drainage.aspx Fines: http://www.cbc.ca/news/canada/calgary/driveway-car-washers-face-3-000-fine-1.849197
Lesson Sketch	1. Round table discussion: Field Study Reflection • What would you include/change about this study if you could do it again? • How could the project be improved? • How can we be certain about our results? How do we know we were accurate in collecting our data? • As a group, did you work well together? Could the roles be improved? • How could you have dealt with someone who did not pull their weight? • What did you do when you didn't agree with someone? Ecosystem • Is the aquatic ecosystem we studied "safe"? Explain. How should we define "safe"? • Did the data show the water to be more/less safe than the place you compared to? How could you tell? • What are your concerns about this ecosystem? What are you happy with? Explain. • Should industry or government be managing water in Alberta? Defend your answer. • What can we learn if we study water in the same location over the long term? • Do you think our data is useful today? In the long term? 2. Unit review activity and revisit the Word Wall.

	3. Prepare for a unit assessment next class.

Closing ideas	What role can citizens like us play in collecting data for scientific/environmental monitoring? Find out about other 'citizen scientist' projects:
	• Everyday citizens can contribute to data collection that is important to long term studying of water, wildlife, etc. Check out some "citizen scientist" sites:
	  • http://naturealberta.ca/programs/birds-biodiversity/citizen-science-database/
	  • http://aep.alberta.ca/about-us/special-weeks/environment-week/documents/CitizenSciencePrograms-Mar2013.pdf
	  • http://scienceoutreach.ab.ca/resources/citizen-science.php
	  • http://albertawater.com/alberta-water-blog/2829-citizen-science-here-s-your-chance-to-make-a-difference-by-mike-kelly
	  • http://www.davidsuzuki.org/what-you-can-do/citizen-science/
	  • https://www.cleanwaterbirthdayproject.com/

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