

Lesson # 9: Setting the Stage (~2 classes)

Topic:	Field Study: Lab analysis x 2 classes
<p>Science 14 Program of Studies outcome(s):</p> <p>Science, Technology and Society (STS) and Knowledge</p>	<p>Students will:</p> <p>2. Analyze a local ecosystem in terms of its biotic and abiotic components, and describe factors of the equilibrium</p> <ul style="list-style-type: none"> • https://education.alberta.ca/media/3069383/pos_science_14_24.pdf
Skills	<p>Initiating and Planning:</p> <p>Ask questions about relationships between and among observable variables and plan investigations to address those questions</p> <ul style="list-style-type: none"> • Identify questions to investigate arising from practical problems and issues • Define questions and problems to facilitate investigation <p>Performing and Recording:</p> <p>Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data</p> <ul style="list-style-type: none"> • Carry out procedures, controlling the major variables • Estimate measurements • Organize data, using a format that is appropriate to the task or experiment • Use tools, technology and apparatus safely <p>Analyzing and Interpreting</p> <p>Analyze qualitative and quantitative data, and develop and assess possible explanations</p> <ul style="list-style-type: none"> • 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 <p>Communication and Teamwork</p> <p>Work collaboratively on problems; and use appropriate language and formats to</p>

	<p>communicate ideas, procedures and results</p> <ul style="list-style-type: none"> • Receive, understand and act on the ideas of others • Communicate questions, ideas, intentions, plans and results, using lists, notes in point form, sentences, data tables, graphs, drawings, oral language and other means • Work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise • Evaluate individual and group processes used in planning, problem solving, decision making and completing a task
Attitudes	<p>Most of the Attitude Outcomes stated in the Program of Studies are included into each of the <i>Wading in for Water</i> lessons. This includes; Interest in Science, Mutual Respect, Scientific Inquiry, Collaboration, Stewardship, and Safety. Please refer to the specific outcomes</p> <p>· https://education.alberta.ca/media/3069383/pos_science_14_24.pdf</p>
Planning ahead	<p>*Safety First: Refer to your school/department/district regulations*</p> <p>-Lab: Field Study Analysis x 2 classes</p> <p>- have microscopes, coverslips, iodine dye, eye droppers, slides ready</p> <p>- have enough test kits for the water analysis (depends on your school supply). May include hardness, phosphorous, etc.</p>
Type of lesson	Lab: Field Study Analysis
Word Wall	Listed in Appendix A

Getting Started

Topic opener “hooks”	<p>Intro/ Hook ideas: Would you like to work outdoors for a living? If so, put this experience on your résumé!</p> <p>How much does someone who does this type of work for a living get paid? (ALIS examples)</p> <ul style="list-style-type: none"> • Hydrometric Technician and Technologist: http://occinfo.alis.alberta.ca/occinfopreview/info/browse-occupations/occupation-profile.html?id=71002547 • Pollution Control Technologist: http://occinfo.alis.alberta.ca/occinfopreview/info/browse-occupations/occupation-profile.html?id=71002708 • Water and Wastewater Operator: http://occinfo.alis.alberta.ca/occinfopreview/info/browse-occupations/occupation-profile.html?id=71002816 • Chemical Technologists and Technicians: http://occinfo.alis.alberta.ca/occinfopreview/info/browse-wages/wage-profile.html?id=2211 • Biological Technician: http://occinfo.alis.alberta.ca/occinfopreview/info/browse-occupations/occupation-profile.html?id=71001558
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<p>Lesson Sketch</p>	<p style="text-align: center;">*Safety First: Refer to your school/department/district regulations*</p> <p>Lab: Field Study Analysis</p> <ol style="list-style-type: none"> 1. Gather samples and data sheet from last class and start analysis (see Appendix C – microscope use) <ol style="list-style-type: none"> a. Microscope <ul style="list-style-type: none"> ○ Parts of a microscope: http://cronodon.com/images/Microscope_labelled_2.jpg ○ Microscope instructions: http://www.microscope-microscope.org/activities/school/microscope-use.htm ○ How to make a wet mount: http://www.microbehunter.com/making-a-wet-mount-for-microscopy/ b. Water analysis c. Identification <ul style="list-style-type: none"> ○ If there were several students who did not attend/were not present for the collection, one option would be to give them the opportunity to do analysis on the tap water so there is a baseline of data for students to compare their results to. <p>When the lab groups have completed the work, ensure that the data sheet is complete. One student from each group (with permission and support of the teacher) will enter the data on the Connections website in Lesson #11. Check over the student data, and store it in a safe location. Teacher link to add the data: (https://seedsconnections.org/share-about-water)</p>
<p>Closing ideas</p>	<ul style="list-style-type: none"> • What happens to water on the International Space Station? Video (time 1:52 with Chris Hadfield): http://www.asc-csa.gc.ca/eng/search/video/watch.asp?v=1_hsvtey71 • Going further: Why is this important? i.e. Mars colony (reference the movie/book, <i>The Martian</i> by Andy Weir, 2011)

Notes: