

[Lesson # 6: Setting the Stage](#)

Topic:	Mid-Unit Assessment and Field Study Preparation
<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"> • describe, in general terms, the characteristics of two Alberta biomes (<i>e.g., parkland, boreal forest, mountain, grassland</i>) • https://education.alberta.ca/media/3069383/pos_science_14_24.pdf
Skills	<p>Initiating and Planning:</p> <p style="padding-left: 40px;">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 style="padding-left: 40px;">Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data</p> <ul style="list-style-type: none"> • Estimate measurements • Use tools, technology and apparatus safely <p>Analyzing and Interpreting</p> <p style="padding-left: 40px;">Analyze qualitative and quantitative data, and develop and assess possible explanations</p> <ul style="list-style-type: none"> • Identify and evaluate potential applications of findings • Identify new questions and problems that arise from what was learned <p>Communication and Teamwork</p> <p style="padding-left: 40px;">Work collaboratively on problems; and use appropriate language and formats to 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

	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> This is a natural break for assessment of outcome #1. Have the field study equipment available for the next week or so (see equipment list) *Safety First: Refer to your school/department/district regulations* Have all the equipment laid out with instructions for use for students to practice how to use it, including: <ul style="list-style-type: none"> Measuring pH (strips/meter) Dissolved oxygen Plant id, insect id, mammal id, single celled organism identification sheets/books Nitrogen/phosphorous/magnesium/hardness Flow rate Temperature Microscope use & review Preparing a wet mount practice Order microorganisms from science supply/ collect water from a fish aquarium
Type of lesson	<p>Outcome #1 Assessment Field study introduction and preparation Hands on practice of equipment</p>
Word Wall	Listed in Appendix A

Getting Started

Topic opener “hooks”	<p>*This is an ideal time to have an Outcome #1 Assessment.</p> <p>Intro/ Hook ideas:</p> <ul style="list-style-type: none"> What are some of the abiotic differences between Medicine Hat and Fort McMurray? Consider the following: <ul style="list-style-type: none"> Annual average precipitation and temperature / summer vs. winter in each locale Industry and local natural resources. Length of day and night in the summer and winter in each locale Landscape features
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<p>Lesson Sketch</p>	<ol style="list-style-type: none"> 1. Which biome do we live in? What makes it different than other biomes? Image: http://biologistsbeyondborders.weebly.com/fun-facts.html 2. What are the 2 main characteristics that make up a biome? Moisture & temperature. Show how the x and y axis of the graph indicate if it is a cold dry/warm dry or cold moist/warm moist. <ul style="list-style-type: none"> • Reference: http://www.nature.com/scitable/knowledge/library/terrestrial-biomes-13236757 3. Review biotic and abiotic factors of an ecosystem. <ul style="list-style-type: none"> • Brainstorm some examples of each. Reference: http://www.nature.com/scitable/knowledge/library/terrestrial-biomes-13236757 4. Field Study preparation description/intro. Explain when and where the class is going and what will be collected. Discuss expectations, safety, etc. <ul style="list-style-type: none"> • Divide class into lab groups of 4-5 students • Assign students to pick a role (see Appendix B) within the group • Brainstorm within the lab groups what data will be important to collect to help assess the water quality of the local aquatic ecosystem. 5. Safety First: Refer to your school/department/district regulations Students have an opportunity to practice using some of the equipment that will be needed for the field study (see Appendix C – microscope use) <ul style="list-style-type: none"> • Microscope station #1: prepared slides (instructions on use) <ul style="list-style-type: none"> ◦ https://www.wisc-online.com/learn/natural-science/life-science/bio905/how-to-use-a-microscope • Microscope station #2: make a wet mount with microorganisms <ul style="list-style-type: none"> ◦ Cover slips ◦ Slides ◦ Microorganisms ordered from science supply/fish aquarium ◦ Organism ID sheet (to laminate) http://www.microscopy-uk.org.uk/index.html?http://www.microscopy-uk.org.uk/pond/index.html ◦ stain (iodine)
<p>Closing ideas</p>	<p>Why might we want to compare a local aquatic ecosystem to one in another biome? What is happening in our community as compared to Medicine Hat? Peace River? Hinton? Edmonton? Fort McMurray? Around the country and around the world? (This should bring the conversation back to what watershed students live within, and where the water drains.) Connect the discussion to the UNESCO Sustainable Development Goals (http://en.unesco.org/sdgs)</p>

Notes: