Field Study Planner

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| **Overview** |
| **Field Study:** | Pond bioblitz | **Conceptual Lens:** | Senses |
| **Overview:** | In this field study, students will participate in a bioblitz, an event that focusses on finding and identifying as many organisms as possible within a certain time frame. First, students will explore a pond ecosystem and search for interesting organisms. Next, students will use a Pond ID Card to identify which organisms are in the pond. Then, each student will select an organism to study and ask questions that can be answered through observation alone. They ask simple questions about the organism’s obvious structures, then move onto questions about organism’s behavior, habitat and relationships to other organisms. Students share out with partners and then the whole group how pond *organisms sense and respond to their environment* (Reference: Beetles). Finally, students participate in citizen science by sharing their data with other field study groups. |
| **Grade:**  | 4 |
| **Duration:** | 2 hours | **Season:** | Spring |

| ***Stage 1 – Desired Results*** |
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| ***Big Ideas*** |
| Living things sense and respond to their environment (Science 4). |
| *Core Competencies* |
| Communication: Students will use scientific language to exchange ideas with peersCritical Thinking: Students will ask & answer questions through observation.Personal Awareness & Responsibility: Students will participate in citizen science by sharing data with other field study groups. |
| Concepts | Field Study Understandings | Transfer Goals | Essential Questions |
| **Senses**InteractionsEnvironmentSurvivalStewardshipInterdependenceEcosystemsAdaptation | **Students will understand that…** Living things have senses that detect changes in their environment.Living things respond to changes in their environment.Anything that causes a living thing to react is called a stimulus.Response to a stimulus is important for its survival.. | **By the end of the field study, students will be able to independently use their learning to…**Use their sense to make observations in the environmentConnect to place and understand their role and responsibility as stewards of the environment Discover and compare their senses to a variety of organisms, both aquatic and terrestrial.Develop a plan of action to address a selected problem or issue in school or community. | **Students will keep considering…**How do living things sense and respond to their environment?What does using my senses in nature look, sound, feel, taste and smell like?How do my senses compare to the senses of other plants and animals?How is sensing and responding related to interdependence within ecosystems? |
| Cheakamus Centre Principles |
| **How does the field study reflect Cheakamus Centre Principles (Place, Community, Inquiry, Personal Connections, and First Peoples’ Perspectives)?****Place**: Students will explore and make observations about organisms within the pond ecosystem.**Inquiry:** Students will ask questions that can be answered through observation.**Community:** Students participate in citizen science by sharing data with other field study groups. |
|  **Alignment Check:**  Are your concepts, unit understandings, transfer goals, and essential questions connected and supportive of your Big Idea? |
| Curricular Competencies | Content |
| Students will be skilled at…Demonstrate curiosity about the natural worldExplore and pose questions that lead to investigationsSafely use appropriate tools to make observations and measurementsMake observations about living & non-living things in the localenvironmentCollect simple dataExperience & interpret the local environmentIdentify some simple environmental implications of their & others’ actionsContribute to care for self, others, & community through personal or collaborative approachesExpress & reflect on personal, shared, others' experience of place | Students will know that…-the ways organisms in a pond ecosystem sense and respond to their environment. –structure and functions of body parts associated with each of the 5 senses-environment: interdependence and adaptation: structural (e.g. how organisms adapt to pond ecosystem); behavioural adaptation (e.g. response to light, touch, water etc.); response to changes in habitat (e.g. pollution, water levels); aboriginal worldview with respect to the environment (e.g. interconnectedness of all living things & responsibility to care for the environment).d aquatic. |
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|  **Stage 2 – Evidence: Assessing for Understanding** |
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| **Assess: Field Study** |
| **Formative:****Checkpoints for students to show their knowledge and skills during the field study** | **Summative:****Final assessments of knowledge and skills at the end of the Field Study** |
| Teachers should consider how formative assessment in outdoor learning is informal, varied, and ongoing throughout the field study. | Teachers should consider how summative assessments revisit essential questions, involve self-reflection, and builds towards Final Task. |
| Assessing prior knowledge:Five senses Mind-mapWalk and Talk to pond: 1. What is a pond? Bigger than \_\_\_\_\_, smaller than \_\_\_\_\_
2. What are some questions you have about ponds & the organisms that live there?

Students will demonstrate their knowledge, skills & understanding by:-collecting organism samples-exploring the pond in a sensory way (smell, hearing, sight)-drawing a sketch of the pond-demonstrating proper use of a hand lens-observing organisms under a hand lens-using Pond Critter Cards to identify different organisms-making a list of species found (type only)-constructing a food chain-learning information about pond organisms from Pond Critter cards-pair-sharing observations, questions, reminds me…Possible Walk and Talk questions:1. How did the organisms get into the pond?
2. What adaptations do organisms have to survive in the pond?
3. Where do the majority of organisms live? Why?
4. What do plants growing around the pond tell us? How about where they are growing?
5. What other mammals, insects, & birds are these organisms supporting?
6. How do you know if the pond is a healthy ecosystem?

  | Final group circle question options:1. What is a pond?
2. How did I notice (observe) the pond organisms?
3. What did I notice (observe) in this field study?
4. How do pond organisms sense and respond to their environment?
5. What questions do I still have about ponds and the organisms that live in them?
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| **Stage 3 – Executing the Learning Plan** |
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| These learning events/activities are suggested activities. Teachers should add, revise, and adapt based on the needs of their students, their own personal preferences for resources, and a variety of instructional techniques. |
| **Introducing the lesson*** **Five senses Mind-map**

Ask students to think about their senses and the important information they provide. The following sequence of questions and discussion is a guide:* + What senses do you have? What sense organs do you use for each one?
	+ Why is it important to have these senses?
	+ Living things use their senses to survive. What are some examples of animals using their senses?
	+ Do all these animals use their senses in the same way?
	+ Pond organisms are animals too. How do pond organisms’ senses compare with your own senses?

**Introducing the Pond Bioblitz!*** **What is a bioblitz?**

A BioBlitz is an event that focuses on finding and identifying as many species as possible in a specific area over a short period of time.Tell the students that today we will find and interview an organism. We will learn about how some pond organisms sense the world around them. We will discuss how their sense organs are different than ours and what this tells us about how the organism lives.**Preparing to be interviewers (15 minutes)*** **Today, we’ll find and interview an organism.** Tell students they’re going to explore and check out a bunch of pond organisms in the Pond bioblitz, then pick one that they’re going to “interview” to learn more about it. That means asking the organisms questions that can be answered by looking more closely at the organism, since it can’t talk!
* **Model an interview of a person in which person can’t talk**.Choose a student volunteer (or counsellor) and explain that you’re going to show some types of questions that can be asked by “interviewing” this volunteer. The person won’t answer back verbally. Instead, you’ll observe the volunteer closely and answer your own questions. For example,
* *What colour eyes do you have? I see you have greenish brownish eyes.*
* *How tall are you? Let’s see, you’re about one foot shorter than me.*
* *What are you doing? Hmmm…you seem to be standing still, fidgeting a little bit, you keep looking over at the wall, interesting…*
* *What are you thinking? Oops! That’s not a question that can be answered.*
* **Explain the difference between simple and deeper questions – both are useful in an interview.**
* *Simple questions can be answered immediately through observation, and don’t have very long answers, e.g. what colour is it? How big is it? What are the main structures of its body? (have students brainstorm some more simple questions)*
* *Deeper questions need more time for observation, and include the organism’s relationship to its habitat and to other organisms, e.g. what is it doing? How many are here? Do they hang out together? What is the climate like in its habitat? (Have students brainstorm some more deep questions).*

**Assembling the Bioblitz toolkit*** Arrange students in teams of 2-3. Give each team a net & a small bucket. Tell students that we are going on a short walk to the Canoe Pond, where we will conduct the bioblitz.

**Walking to the Canoe Pond (10 minutes)*** Ask students walk & talk questions while walking to the pond. e.g. What is a Pond? Bigger than a \_\_\_\_\_\_\_, smaller than a \_\_\_\_\_\_\_. What are some questions you have about ponds and the organisms that live there?

**Building Ecosystem Literacy (Pond Big Picture) @ Canoe Pond*** **Talk about the importance about thinking about organisms’ surroundings.** Point out to students that it’s easier to come up with deeper questions and understand organisms when you know a bit about where an organism lives and what it’s like there.
* At the pond, circle students up & perform a ‘Sensory Warmup’. Ask the students the following questions:

 *What does the pond smell like? What caused these smells? (smell)* *How many sounds can you hear? (hearing)* *What does it look like? (vision)* *What is the source of the pond: rain water, seepage, stream? (vision)* *What kind of plant life is growing in and around the pond (terrestrial vs. aquatic plants) (vision)* *What mammals, birds, insects does the pond support? What evidence is there around the pond? (tracks, scat, visuals, nests?) (vision)** Bring group back together & ask a few students to share their observations with the whole group.
* Students draw a quick sketch of the pond, and surrounding area (optional).

**Preparing to Explore*** **Invite students to slow down, get down, & look around for organisms.** Encourage students to think about how the surroundings might affect where they find organisms.
* **Explain that students will collect a pond sample.** Let your students know they will have time back at the Aquatics lab (about 10 minutes) to explore and look at different creatures before choosing an organism to focus on.
* Activity logistics: student groups natural boundaries, materials and timing. Split students into groups of 2-3. Model sampling technique (counsellor). Set boundaries for exploration, and explain pond safety rules. Choose a signal to call the group back together before releasing them. Refer to *Pond Field Study Orientation* for more information.

**Back at Aquatics Lab (45 minutes)****Interviewing Organisms*** Students observe organisms using hand lens, then choose one organism to focus on. As students explore, help those that are having trouble finding organisms. Focus on being a co-explorer. After 10 minutes, remind students to select an organism to interview.
* **Draw and record information.** Tell students they will sketch their organisms and record the information they find out during their interview. It may be helpful to model what you’re saying by drawing it on a white board.
* *When you find an organism you’re going to make a scientific sketch of it. That means you don’t have to worry about making a pretty picture –you’ll be making a diagram showing the organisms’ structures and your observations. Draw the organism as accurately as you can. If your organism is very small, though, you might choose to draw it larger than life on your page.*
* *As you’re sketching and interviewing your organism, write down questions you ask the organism and any information you get as an answer. If you’re referring to specific parts of the organism in your writing, you can use arrows to show what part of the organism you’re talking about. You could even draw a little map showing the surroundings where you found your organism. Make sure to include the date and location somewhere on your page.*
* Students record questions & answers as they observe organisms. Circulate as students conduct their interviews, and make sure they are asking both simple and deep questions. If students are having trouble coming up with questions, remind them to consider the organisms’ habitat and surroundings. Make sure students use both drawing and writing to record information.
* Individuals share observations and questions with each other. When students have had time to do an in-depth interview, call the groups together, and have each team share their questions and observations with another team.
* Group sharing & discussion: Ask a few students to share an interesting question or observation. Depending on what they say, consider leading a discussion about the difference and similarities between organisms, or make some observations together as a group.
* Briefly discuss what adaptations aquatic organisms have to survive in the pond (relate to how living things sense and respond to their environment). Bug Sense Trivia:
* What are some of the things insects need to do to survive? (Avoid predators/enemies, find food and water, find a mate.) Are these the same as us?
* Can you think of an example of a pond organism using its sense of seeing/hearing/touch/smell/taste?
* Pond organisms have evolved different sensory organs to do the same job as ours. So insects use the same senses as we do, but do they have the same sensory organs? (Yes and no.)
	+ A male mosquito can tell the difference between a female who is looking for a mate and one who has already laid her eggs by listening to her wingbeat!
	+ Have you ever been to a 3D movie? Some 3D movies, the ones with 3D goggles that look like sunglasses, take advantage of the fact that humans cannot see the polarization of light, but many insects can. This helps them to navigate.
	+ Most insects and spiders taste with their feet. That is why flies like to walk around on your food.
	+ Water striders gliding on the surface of a pond use their sense of touch to detect ripples from predators or prey, much like a spider uses her web.
	+ Insects can use their antennae as feelers, but the main function of antennae is smell! Many insects also have olfactory receptors (a fancy word for “noses”) on their feet.
	+ Insect ears are all over the place! For example, grasshoppers have ears on their knees, praying mantises have them on their bellies, and mosquitoes have them at the base of their antennae.
	+ An insect’s eyes are called compound eyes. They are made up of many little lenses, instead of one big lens (like our eyes have). They cannot see detail as well as us, but they have some advantages: butterflies can see more colors than us, bees can see something called the polarizationof light, and horseflies can respond to movements much, much faster than people can!
	+ Insects can taste with their mouth, just like us, but most also taste with their feet. Would you want to taste the inside of your shoes?

**Identifying the Organism (to be completed before or after interview)*** Tell students they’ll use the Pond ID card to identify their organism.
* Demonstrate how to use the Pond ID card.
* Students use the cards in teams to figure out what their organism is.
* Circulate, trouble-shoot, be a co-investigator, and ask questions.

**Discussing Findings** * Students share what organisms they found. Write list of organisms on white board. Summarize results:

 *What aquatic organisms live in the pond?* *Where do we find the organisms? –shallow zone, middle/open water, bottom sediment (mud or sand?), near shoreline* *Diversity: - what species were found in pond?* *How does this compare to data collected by other field study groups (citizen science)?** Focus the discussion on the relationship between organisms
* *Can we construct a food chain with organisms found (on whiteboard)?*

**Wrapping it up*** *Today, we learned about how pond organisms use their senses in different ways, using some of the same sense organs and some different ones. Who can tell me one of the senses that’s the same in you and a pond organism? One that’s different?*
* Revisit Essential Questions: Circle debrief*. What is a pond? How did I notice (observe) the pond organisms? What did I notice (observe) in this field study? How do pond organisms sense and respond to their environment? What questions do I still have about ponds and the organisms that live in them?*
* Encourage students to keep interviewing organisms while at Cheakamus Centre. Emphasize to students that they now have skills they can use with any organism anytime, and that scientists do this all the time. Ask students to think about simple and deep questions they could ask of organisms they encounter in other field studies.
* Have counsellors release organisms back into the pond habitat as close as possible to where they found them.
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| **Resources:** ODS Pond Orientation[Beetles: Hand Lens Intro](http://beetlesproject.org/resource/hand-lens-intro/)[Beetles: Walk and Talk](http://beetlesproject.org/resources/for-field-instructors/walk-and-talk/)[Beetles: I notice, I wonder, It reminds me of](http://beetlesproject.org/resources/for-field-instructors/notice-wonder-reminds/)**Pond ID Card**Strange Beginnings by Karen Needham and Launi Lucas[bioblitz Canada](http://bioblitzcanada.ca/) |
| **Teacher: Field Study Reflection** |
| **What aspects of the field study went well?****What did students struggle with?****What did you struggle with?****What would you add/revise the next time you taught this field study?****What connections can I make back to my school learning community?**Organize a bioblitz event in your school yard or in nearby nature.Develop a plan of action to address a selected environmental problem or issue related to water systems |