



SCIENTIST IN RESIDENCE PROGRAM™

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Science Unit: *Discovering Life in Local Habitats*

Lesson 10: *What is a Habitat?*

Summary: Students learn about the concept of a **habitat** by exploring their **schoolyard** and making and recording careful **observations** using microscopes and magnifying glasses.

School Year: 2013/2014

Developed for: Sir William Osler Elementary School, Vancouver School District

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Grade level: Presented to grade 2/3/4; appropriate for grades 1 – 7 with age appropriate modifications

Duration of lesson: 1 hour and 20 minutes

Notes: This lesson is a modification of “Discovering Life in Local Habitats” Lesson 1 – Urban Life: What Lives in Our Schoolyard

Pocket microscopes can be purchased from Dynamic Aqua
<http://www.dynamicaqua.com/>.

Objectives

Students will be able to:

1. Learn about habitats and microhabitats by exploring the schoolyard.
2. Make and record observations.
3. Use a magnifying glass and/or microscope.

Background Information

What is a habitat?

A habitat is the space/place that supports a population of living organisms. (A population is a group of organisms of the same kind that live in one area.) Habitats can occur on a variety of scales – from macro to micro (e.g. a small pond or a single drop of water). A habitat must meet the needs an organism requires to survive - food, water, shelter, oxygen, climate, temperature, light levels, etc.

Vocabulary

Observing: Looking carefully at something and examining it with all five of your senses.

Living thing: Anything that grows, feeds, moves, excretes, reproduces, and reacts to surroundings.

Habitat: The place where a population lives. A habitat must meet the needs an organism requires to survive (food, water, shelter, temperature, oxygen, etc.).

Microhabitat: A tiny habitat within a larger habitat.

Population: A group of living organisms of the same kind that live in one area.



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Materials

- Worksheets
- Magnifying glasses
- Pictures or slides of common items under magnification (e.g. leaf stomata, wood – showing xylem and phloem and human hair.
- Pencils
- Clipboards
- Red oak cut into a “straw” (optional)
- Pocket microscopes or regular dissecting microscopes
- Large petri dishes or similar (used to bring organisms into the classroom for closer observation)

In the Classroom

Introductory Discussion

- Introduce or review what a scientist does class using a class brainstorm (asks questions, makes careful observations, makes accurate measurements, etc.)
 - Discuss how making careful observations and accurate measurements are important skills for a scientist; students will be using these skills in our activity today.
 - Today we are going to start our science unit on habitats. Who has heard the word habitat before? What is a habitat? Review the definition of a habitat.
 - What needs must a habitat meet? (brainstorm and record on board) (food, water, shelter, air/oxygen, safety from predators, climate, temperature, etc.)
 - What are some habitats you can think of that biologists might study? What about urban habitats?
 - Today we are going to study our local schoolyard habitat. What do you think lives in our schoolyard? (common answer is “not much”).
 - In today’s activity we are going to use our observation skills to study some of the microhabitats in our schoolyard. What is a microhabitat? Can prompt students by telling them to think about the meaning of the word micro. Once definition has been established ask students for examples of microhabitats within a specific habitat. If the classroom looks out onto the schoolyard you can use the schoolyard and ask what they can see out the window. If this isn’t an option you can use a picture of a habitat such as a garden or local park and then move onto the schoolyard.
 - Review five senses.
1. Short description of other items to discuss or review.
 - Review safety rules for being outside of the classroom.
 - Discuss how to treat living organisms with care and respect.
 2. Briefly describe science experiment/activity.
 - Students will use four senses to make observations about the schoolyard – sight, hearing, touch and smell (no tasting).
 - Students will make observations and explore the living things in their assigned microhabitat. The scientist can determine the microhabitats in advance. They can consist of a general area (e.g. under this tree) or be laid out more precisely by using a square made from a loop of string staked out in the schoolyard – use ~4m to create a 1 m² area.)



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- Students will select one living thing from their microhabitat to observe in greater detail.
 - Back in the classroom, students will look more closely at their chosen living thing with magnifiers and draw it.
 - The lesson will conclude by looking at microscopic images of familiar living things.
3. Briefly describe the processes of science that the students will focus on: Students will focus on making and recording observations.
 4. Briefly describe safety guidelines.
 - Students should stay in the designated area while outside of the classroom and be within sight of an adult at all times.
 - Students should wash their hands when they return to class and again before touching their face or going for recess.

Science Activity

Activity Title: Biologists Explore a Habitat

Purpose of Activity: To carefully observe microhabitats in the schoolyard and discover the life living there.

Methods and Instructions:

Set-up prior to experiment: Determine appropriate microhabitats within the schoolyard prior to the lesson. If the areas cannot be naturally defined (e.g. under this tree), stake out 1m² plots with string and wooden stakes.

Students will work in pair to study their microhabitat but will complete worksheets individually.

1. Once out in the schoolyard ask the students to use their four senses (no tasting) to observe the school yard habitat.
2. Students can record their observations or they can be discussed as a group.
3. Allow student pairs to choose microhabitats to study or assign microhabitats, whichever is more appropriate.
4. Students will make detailed observations of their habitats and look closely to explore as many living things as possible for approximately 20 minutes.
5. After 20 minutes ask students to choose one living thing to bring back to the classroom to look at more closely (e.g. grass, moss, leaf, cone, ant). If it is an animal, ask an adult to put it in a petri dish and it will be returned to the same place after class.
6. Back in the classroom, ask students to lay their living things on their desks, and hand out magnifying glasses (1 for each student) and pocket microscopes (one for each table of 4 students). If pocket microscopes are not available an alternative is to set up dissecting scopes at a separate table. For younger students the scientist can pre-select a few samples and have them set up at the microscopes already.
7. Demonstrate how to use magnifiers. Ask students to make a new drawing of their living thing, showing the details that they can now see with the magnifying glass. If students are using pocket microscopes (30X magnification) they can use these to make more detailed observations.
8. If using dissecting microscopes you can ask small groups of students to bring their living things to the microscopes, to see even more detail on their living things.
9. They can also explore other student's living things, other parts of the classroom and their hands, hair etc. (what does your fingernail look like through the magnifier?).
10. Students will record their observation on their worksheets.



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Closure Discussion

1. What was the most interesting thing you discovered?
2. Were you surprised by how many living organisms you found in the schoolyard? How were the needs of the living things you found met by the surroundings you found them in?
3. Show pictures of common items under magnification – the items used in this lesson were a leaf showing the stomata, a piece of wood showing the holes of the xylem and phloem and a human hair. Have students guess what each picture is and then discuss it. Students are usually quite surprised by the wood as wood is thought of as a solid material. Discuss how the tubes they see are used to transport water and nutrients within the tree. If possible, have a piece of red oak cut into a 10-15 cm “straw” If you put one end in a glass of water and then cover the other end with your mouth and blow the students will see bubbles as the air travels through the tubes.
4. Conclude that careful observation is the first step to understanding more about our world and the living things in it.



Biologists Explore a Habitat

What habitat did we explore?

What senses did you use to make your observations?

Describe the microhabitat you explored. Draw a picture or use describing words.



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Microhabitat name: _____

Description:

What object did you pick for closer observation?

Draw a picture and describe your object



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Look at your object with the magnifier. What can you see that you didn't see without the magnifier? Or what can you see better?


