Science Unit: ***Discovering Life in Local Habitats***

Lesson 1: ***Urban Life: What Lives in our Schoolyard?***

School Year:	2009/2010
Developed for:	Weir Elementary School, Vancouver School District
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Grade level:	Presented to grades 1 and 2; appropriate for grades K – 7 with age appropriate modifications
Duration of lesson:	1 hour and 15 minutes

Objectives

1. Learn to look closely, and be rewarded with finding the unexpected.
2. Discover that there is life everywhere, even in an urban setting.
3. Record accurately what is observed.
4. Learn to use a magnifying glass and microscope.

Background Information

This is the first lesson in a unit of six science lessons, and is technically simple. It introduces the scientist, use of the students' science notebooks, and using key methods of scientific investigation: careful observation and accurate recording. Students use their eyes, magnifying glasses and microscopes to observe and record life in the schoolyard.

Vocabulary

science	investigating what is in our world and how it works
observing	looking closely at something - maybe the most important skill of a scientist
recording	accurately writing down what is observed
living thing	anything that grows, feeds, moves, excretes, has babies, and reacts to surroundings
lens	a curved piece of glass or plastic that make objects look larger
magnifying glass	a handheld lens to make objects look larger
microscope	an instrument with more than one lens to make objects look larger
eyepieces	where you look through on a microscope
focus	an adjustment on a microscope to make the object appear at its sharpest.

Materials

- science notebook and pencil for each student
- loop of string for each student
- 4 short sticks for each student (to stake out the string)
- collecting boxes for small animals
- good quality magnifying glass for each student
- dissecting microscope, ideally 4 or more
- scanning electron microscope images of common living things
- flashlight as backup microscope lamp

Lesson in the classroom/in the schoolyard

1. **Introductory Discussion:** Ask what a scientist does, and list ideas. (Looking closely at things, recording observations, asking questions, making predictions/hypotheses, being curious etc). Ask whether students themselves do any of these things when they are interested in learning about something. They are scientists too! Conclude that careful observation and recording are a simple but important skill of a scientist; students will be using these skills today outside in the schoolyard.
2. Other items to review: introduction to science notebooks - they will be used for recording what we find today, and for taking notes for all our classes together.
3. Brief description of science activities to follow discussion:
   - Find as many living things as possible in a square made from a 1 metre loop of string staked out in the schoolyard.
   - Back in the classroom, look more closely at a chosen living thing with magnifiers and draw it.
   - Look at chosen living thing under a microscope.
   - Look at scanning electron microscope images of familiar living things.
4. Processes of science that the students will focus on: careful observation and recording findings.
5. Safety guidelines: stay within the outside area designated by teachers.

Science Activities

(1) Activity Title: What living things are in our schoolyard?

Purpose of Activity: To carefully observe areas of the school grounds and discover the life living there.

Methods and Instructions:
Set-up prior to experiment: none.
Students work individually.

1. Out in the schoolyard, give each student a 1m length of string tied into a loop, and 4 wooden stakes. Ask them to make a square with the string within a designated area. Ask the students to draw a square in their notebooks, and then draw what they see in their string square, using a symbol for each kind of living thing (e.g. G for grass). The object is to find as many living things as possible in the square. (Two plants that look different count as two different living things).
2. Ask students to choose one living thing to bring back to the classroom to look at more closely (e.g. grass, moss, leaf, cone). If it is an animal, ask an adult to put it in a collecting box, and it will be returned to the same place after class.
3. Discussion: What living things were you surprised to find in the school yard? There are living things in places that you would not expect. How were the needs of the living things you found met by the surroundings you found them in?

(2) Activity Title: Looking more closely at living things.

Purpose of Activity: To use a magnifying glass and microscope to see more details on living things.

Methods and Instructions:

Set-up prior to experiment: microscopes set up at the side of the room.
Students work individually.

1. Back in the classroom, ask students to lay their living things on their desks, and hand out magnifiers. Demonstrate how to use magnifiers (see ref 1). Ask students to make a new drawing of their living thing, showing the details that they can now see with the magnifier.
2. Ask small groups of students to bring their living things to the microscopes, to see even more detail on their living things (for microscope use, see refs 1-4). While the small groups break out, ask the rest of the class to look at other students' specimens through the magnifiers. They can also explore other parts of the classroom and themselves (what does someone's eye look like through the magnifier?)
3. Discussion: What did you see with the magnifiers or the microscope that you were not able to see without them?
4. Show images of familiar living things magnified even further: scanning electron microscope images (refs 5-7).

Closure discussion

Conclude that careful observation is the first step to understanding more about our world and the living things in it. Tomorrow we will be carefully observing the living things in a local park.

References

1. <http://www.saburchill.com/lab/observations/observe01.html> Observing in biology. The Open Door Website. Accessed March 25, 2010.
2. <http://www.saburchill.com/lab/observations/observe04.html> Looking at a slide using a microscope. The Open Door Website. Accessed March 25, 2010.
3. <http://www.scientistinresidence.ca> Previous SRP lesson on microscope use: SRP_Stereo Microscope Lesson_2007 R.doc.
4. Levine, Shar and Johnstone, Leslie. 1996. The microscope book. Sterling Publishing Company.
5. <http://www.denniskunkel.com/> Electron Microscope Images (note some are artificially coloured). Dennis Kunkel Microscopy Inc. Accessed March 25, 2010.
6. Scharf, David. 1977. Magnifications. Publisher Schocken. (Electron microscope images)
7. Breger, Dee. 1995. Journeys in Microspace. Columbia University Press. (Electron microscope images)

Extension of Lesson Plan

1. Leave microscopes set up for students to look at things, living and non-living, that they find.
2. Use scanning electron microscope images for guessing game: what living thing is this part of?