
Unit 4: Life Science

Topic: Ecosystems

Unit Overview: The Life Science unit consists of three topics:

- A. Ecosystems
- B. Plants
- C. The Human Body

The Ecosystems topic is divided into 2 chapters:

- Chapter One: Populations & Communities
- Chapter Two: Ecosystem Food Chains
- Chapter Three: Biomes of the World Project

Unit 4 is our final content unit and one that intrigues students because every chapter can be related to their everyday experiences. Teaching the Life Science unit at the end of the school year helps to keep students motivated. Studying topics such as life in an ecosystem, growing plants from seeds, and investigating the human body systems engage students in a new and interesting way. In addition, your fifth graders are quickly becoming sixth graders with skills and knowledge learned through your teaching. Think back for a moment to the first few weeks of this school year and reflect on how far you have brought those wide-eyed beginning grade five students that faced you. Yes, they have matured in more ways than they realize and you have been the driving force in the development of their science knowledge and skills.

Homilies: I always found that keeping students interested as the school year was coming to a close was a challenge. Being able to get outside to observe and investigate our local ecosystem was a fun way to keep students (and myself!) motivated. Another factor for keeping this unit until the end was that by this time, students had learned how to “do” good science. That is, working as a team, observing and collecting data, making inferences and drawing conclusions without the immature behaviors they started the year with. This is not to say that there are no behavior problems or issues, however, by now students know and understand your expectations of how to be a scientist. Together, you and your students will use this unit to make sense of how living things react within a system whether it is the human body or the environment of our planet Earth.

Teaching Tip: Plan ahead to collect reference books, pictures and photos of a variety of plants and animals by checking out books, videos, slides from the school library or media center and telling students to cut out pictures to bring into class for this unit. Students will need books about different animals and their characteristics. Many students may have these resources at home and are always eager to bring them into the classroom to share.

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Topic: Lesson 4-1 “Unit 4, Chapter 1: Populations and Communities”

Objective(s), skills attained & motivation:

- Introduce living and non-living things in their environment
- Explain biotic and abiotic factors

Materials:

- Notebooks
- Chart paper/board
- CN 4.1, Our Environment overhead
- Portfolio Reflections essay

Starter Activity: Collect Portfolio Reflections homework

Content/background support: **Ecosystems** are a way of studying our planet’s natural environment by breaking it into small parts or units. I read somewhere that “the world is one large environment with smaller environments within it”. I found that statement helpful when teaching ecosystems to my students. In order to understand the many different environments within our planet, we must break them into smaller environments and work from there. We will begin with **habitats**. Habitats are the small areas in which a plant or animal species lives. Within a habitat, scientists have separated it into even smaller units called **niches** (rhymes with “witches”). A **niche** is the specific area that an animal or plant occupies within its habitat. **For example, a single tree might be a habitat for many living things. Think, are there birds living in the trees branches? Are there insects living within the tree’s bark? Is there moss or fungi living off the parts of the tree trunk or roots?** Each of these living things has found their niche within the habitat of the tree. It is the interactions of living and non-living things that allow a habitat to survive. Did you know that the word *ecology* comes from the Greek word for *home*? When we study living things and their environment, we are studying the ecology of our planet. This lesson will introduce students to the ecosystem of their schoolyard where they will identify the habitats and niches of living and non-living things they observe there.

Procedure: Habitats

1. Conduct a class discussion by asking, “What is the environment?” Students should realize that the environment is everything that surrounds them. Help them to draw the conclusion that their environment is made up of many parts or smaller environments.
2. Ask, “Is your environment made up of living or non-living things?” Students should realize that the environment is made of both living and non-living things. Review the definition for organism and explain that any and all living things are called organisms.

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3. Tell students to open their notebooks and title a page "My Environment". Divide the page into two columns with the headings "Living (Biotic)" and "Non-Living (Abiotic)". Make a larger version of the chart on the board or chart paper.
4. Explain that scientists classify living things in the environment as "Biotic" so they can think of Biotic factors in the environment as any living thing. "Abiotic" (prefix "a" stands for "not") factors are all non-living things in the environment.
5. Allow students to brainstorm within each group to list examples in each column.
6. After a few minutes, continue the class discussion by having each group share their ideas of what they listed as living and non-living things. Record responses on the class chart. Ask, "Which of these lists are organisms?"
7. Display the first part of CN 4.1, Our Environment notes (keep a piece of paper over the bottom part of the overhead) and have students add them to their notebooks.
8. Ask students to think about how scientists study the environment of our planet. Discuss the many different environments that they may find and ask them to think about how such a huge task could be simplified.
9. Using their ideas, write "habitat" and "niche" on the chart paper/board and explain the meaning of each term using the bold faced questions from this lesson's content background/support.
10. Display bottom part of CN 4.1 and have students copy notes into notebooks. Discuss the questions together and have students write their answers in the notebooks.
11. Use the example of the tree given in the content background/support for this lesson without using the terms habitat and niche. Ask students to place the tree and its living things into the habitat/niche chart. Continue the class discussion using other habitats familiar to your local region such as a pond, river, desert, mountain area, etc. Each of these areas is the home (ecosystem) for many habitats and niches.

Homework:

- Look through magazines for 4 pictures of nature: plants, animals, forests, lakes, rivers, mountains to bring to class

Topic: Lesson 4-2 "Is it biotic?"

Objective(s), skills attained & motivation:

- Reinforce understanding of biotic and abiotic factors in ecosystems

Materials:

- Magazines pictures of nature settings
- Drawing or construction paper, one per student
- Markers/crayons
- Notes from last class

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Starter Activity: Give each group one large mailing envelope to store the group's nature pictures. Each student in the group is responsible for bringing in at least 4 pictures for the group collection.

Procedure: Drawing pictures

1. Review class notes from last class and discuss the meaning of biotic as living things and abiotic as non-living things.
2. Ask students if water, soil, dirt, rocks, sunlight, etc. would be considered biotic or abiotic (answer should be abiotic).
3. Pass out drawing paper to students along with group's nature pictures collection.
4. Students will draw a scene from their nature pictures in the center of the drawing paper leaving a wide margin along each side.
5. The drawing should include four biotic and four abiotic factors.
6. Along the sides of the drawing paper, students will list which things in their drawing are Biotic and which are Abiotic.

Teaching Tip: Prior to next class, review SA 4.2, "A Local Habitat" and choose an outdoor area in or near the schoolyard that students can explore.

Homework:

- *Bring in magazines and pictures of nature for group collection*

Topic: Lesson 4-3 "Local Habitats"

Objective(s), skills attained & motivation:

- Investigate a local habitat

Materials:

- Meter sticks, one per group of 4 students
- Hand lens, at least 2 per group of 4 students
- Toothpicks, one per student
- 4 objects (blocks, rulers, pencils) used to mark off the habitat
- SA 4.2, "A Local Habitat" lab activity

Starter Activity:

1. Tell students that they will be studying a local habitat near the schoolyard that you have chosen (this may be on the school grounds or nearby so that students may make observations during the school day with you).
2. Begin class by telling students where the local habitat is and ask them to think about the types of living and non-living things they might find there.
3. Go over SA 4.2, "A Local Habitat" lab directions and distribute group materials.
4. Have students complete the "Living things I interact with" section and step #3 predictions before going outside.

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Content/background support: How often do we really think about and examine mini-habitats around us? A habitat can be as small as a single potted plant and as large as a desert biome. You will find that students really become engaged in exploring their mini-habitats, but it is important to stress that they never destroy a living thing and their home. Encourage them to gently turn over rocks and pebbles or rotted leaves and logs, but insist that they return them to the position and place they found them so that their natural habitat is not harmed.

Teaching Strategy: Keep an area of the classroom open to display books and magazines that have pictures of natural ecosystems around the world. Group picture collection envelopes could be stored in this area as well. Remind students that they need to collect nature photos to be used for this unit's activities. As we work through this unit, students will need their collections to complete activities.

Procedure: Visiting the habitat area

1. Move students outside to the habitat area.
2. Tell students that they will complete #1-4 of the lab activity today and continue their observations next class.
3. When students have completed #1-4, stress that they should have recorded clear descriptions of how to locate their habitat area again.
4. Have students collect all materials before returning to the classroom.
5. Habitat observations will continue next class.
6. For homework, students should find a small habitat in their neighborhood to study.

Homework:

- Check out a small habitat in your neighborhood

Topic: Lesson 4-4 "Observing Habitats"

Objective(s), skills attained & motivation:

- Habitat observations

Materials:

- Meter sticks, one per group of 4 students
- Hand lens, at least 2 per group of 4 students
- Toothpicks, one per student
- 4 objects (blocks, rulers, pencils) used to mark off the habitat
- SA 4.2, "A Local Habitat" lab activity

Procedure: Continue SA 4.2

1. Continue habitat observations from SA 4.2 lab last class.
2. Students will investigate their habitat area and complete SA 4.2, #5-9 outside.
3. SA 4.2 #10-12 will be finished next class.