

Life Science

____ Grade 4 ____

Written by Tracy Bellaire

The experiments in this book fall under ten topics that relate to two aspects of life science: **Needs and Characteristics of Living Things; and Exploring the Senses**. In each section you will find teacher notes designed to provide you guidance with the learning intention, the success criteria, materials needed, a lesson outline, as well as provide some insight on what results to expect when the experiments are conducted. Suggestions for differentiation are also included so that all students can be successful in the learning environment.



Tracy Bellaire is an experienced teacher who continues to be involved in various levels of education in her role as Differentiated Learning Resource Teacher in an elementary school in Ontario. She enjoys creating educational materials for all types of learners, and providing tools for teachers to further develop their skill set in the classroom. She hopes that these lessons help all to discover their love of science!

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Learning Intentions

	What is a Habitat?	Habitat Investigation	A Habitat Creation	Food Chains and Webs-Pt.1	Food Chains and Webs-Pt.2	Balance in the Natural World	The Human Factor	Plant Parts	What Do Plants Need?
Knowledge and Understanding Content									
Determine what a habitat is, and identify what living things co-exist in a local area	.								
Identify different types of habitats and their inhabitants; choose one to study		.							
Investigate how wood lice depend on their habitat to meet their needs; create a living habitat			.						
Recognize living things as herbivores, carnivores, omnivores, and insectivores; build food chains and food webs consisting of different living things				.					
Describe the role of living things as producers, consumers, or decomposers; investigate the benefit of earthworms in making nutrient rich soil					.				
Identify the biomes of the world and study an ecosystem existing within one						.			
Recognize the usefulness of plants and animals to humans; identify positive and negative impacts of human interactions on natural habitats							.		
Identify and describe the main parts of a plant; investigate how the parts work to help a plant survive								.	
Determine the basic needs of plants in order to grow healthy; recognize the importance of plants to people and to all living things in the natural environment									.
Describe the physical characteristics of fish, reptiles, and amphibians; research to learn more about their life cycles									
Identify different mammals and describe their physical characteristics; research to learn more about a mammal									
Thinking Skills and Investigation Process									
Make predictions, formulate questions, and plan an investigation		
Gather and record observations and findings using drawings, tables, written descriptions
Recognize and apply safety procedures in the classroom
Communication									
Communicate the procedure and conclusions of investigations using demonstrations, drawings, and oral or written descriptions, with use of science and technology vocabulary
Application of Knowledge and Skills to Society and the Environment									
Analyze the impact of human interactions with natural habitats and their communities, and determine how to minimize the negative impacts	
Assess the impacts of the depletion or extinction of an animal or plant species on other living things in its habitat, identify possible actions to prevent depletion or extinction	.	.				.			

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Teacher Assessment Rubric

Student's Name: _____

Date: _____

Success Criteria	Level 1	Level 2	Level 3	Level 4
Knowledge and Understanding Content				
Demonstrate an understanding of the concepts, ideas, terminology definitions, procedures and the safe use of equipment and materials	Demonstrates limited knowledge and understanding of the content	Demonstrates some knowledge and understanding of the content	Demonstrates considerable knowledge and understanding of the content	Demonstrates thorough knowledge and understanding of the content
Thinking Skills and Investigation Process				
Develop hypothesis, formulate questions, select strategies, plan an investigation	Uses planning and critical thinking skills with limited effectiveness	Uses planning and critical thinking skills with some effectiveness	Uses planning and critical thinking skills with considerable effectiveness	Uses planning and critical thinking skills with a high degree of effectiveness
Gather and record data, and make observations, using safety equipment	Uses investigative processing skills with limited effectiveness	Uses investigative processing skills with some effectiveness	Uses investigative processing skills with considerable effectiveness	Uses investigative processing skills with a high degree of effectiveness
Communication				
Organize and communicate ideas and information in oral, visual, and/or written forms	Organizes and communicates ideas and information with limited effectiveness	Organizes and communicates ideas and information with some effectiveness	Organizes and communicates ideas and information with considerable effectiveness	Organizes and communicates ideas and information with a high degree of effectiveness
Use science and technology vocabulary in the communication of ideas and information	Uses vocabulary and terminology with limited effectiveness	Uses vocabulary and terminology with some effectiveness	Uses vocabulary and terminology with considerable effectiveness	Uses vocabulary and terminology with a high degree of effectiveness
Application of Knowledge and Skills to Society and Environment				
Apply knowledge and skills to make connections between science and technology to society and the environment	Makes connections with limited effectiveness	Makes connections with some effectiveness	Makes connections with considerable effectiveness	Makes connections with a high degree of effectiveness
Propose action plans to address problems relating to science and technology, society, and environment	Proposes action plans with limited effectiveness	Proposes action plans with some effectiveness	Proposes action plans with considerable effectiveness	Proposes action plans with a high degree of effectiveness



Student Self Assessment Rubric

Name: _____ Date: _____

Put a check mark ✓ in the box that best describes you:

	Always	Almost Always	Sometimes	Needs Improvement
I am a good listener.				
I followed the directions.				
I stayed on task and finished on time.				
I remembered safety.				
My writing is neat.				
My pictures are neat and colored.				
I reported the results of my experiment.				
I discussed the results of my experiment.				
I know what I am good at.				
I know what I need to work on.				

1. I liked _____

2. I learned _____

3. I want to learn more about _____



INTRODUCTION

The activities in this book have two intentions: to teach concepts related to life science and to provide students the opportunity to apply necessary skills needed for mastery of science and technology curriculum objectives.

Throughout the experiments, the scientific method is used. The scientific method is an investigative process which follows five steps to guide students to discover if evidence supports a hypothesis.

1. Consider a question to investigate.

For each experiment, a question is provided for students to consider. For example, “What could happen if there is too much or too little of a particular life species in an ecosystem?”

2. Predict what you think will happen.

A hypothesis is an educated guess about the answer to the question being investigated. For example, “I believe that if a certain life species is not available in a food chain, other living things in the chain will not survive”. A group discussion is ideal at this point.

3. Create a plan or procedure to investigate the hypothesis.

The plan will include a list of materials and a list of steps to follow. It forms the “experiment”.

4. Record all the observations of the investigation.

Results may be recorded in written, table, or picture form.

5. Draw a conclusion.

Do the results support the hypothesis? Encourage students to share their conclusions with their classmates, or in a large group discussion format.

The experiments in this book fall under nine topics that relate to two aspects of life science: **Habitats and Communities; and Plant Growth and Changes.** In each section, you will find teacher notes designed to provide you guidance with the learning intention, the success criteria, materials needed, a lesson outline, as well as provide some insight on what results to expect when the experiments are conducted. Suggestions for differentiation are also included so that all students can be successful in the learning environment.

ASSESSMENT AND EVALUATION:

Students can complete the Student Self-Assessment Rubric to determine their own strengths and areas for improvement. Assessment can be determined by observation of student participation in the investigation process. The classroom teacher can refer to the Teacher Assessment Rubric and complete it for each student to determine if the success criteria outlined in the lesson plan has been achieved. Determining an overall level of success for evaluation purposes can be done by viewing each student’s rubric to see what level of achievement predominantly appears throughout the rubric.

WHAT IS A HABITAT?

LEARNING INTENTION:

Students will learn about what a habitat is, and what living things co-exist in a local area.

SUCCESS CRITERIA:

- describe a habitat
- identify a variety of plants and animals in your school yard/ local park as living things
- illustrate a habitat
- determine the populations of living things in your school yard/ local park
- describe how inhabitants of an area live together as a community
- determine the threats to a forested habitat and its inhabitants

MATERIALS NEEDED:

- a copy of “A Habitat is a Home” worksheet 1 for each student
- a copy of “What’s Living Out There?” worksheet 2 and 3 for each student
- a copy of “Populations” worksheet 4 for each student
- a copy of “A Tree in the Forest” worksheet 5, 6, and 7 for each student
- iPods or iPads (*optional*)
- a class set of magnifying glasses
- a read aloud about habitat (*see suggestion in #5 of procedure section*)
- modeling clay
- chart paper, markers, pencil crayons, clipboards, pencils

PROCEDURE:

***This lesson can be done as one long lesson, or can be done in four or five shorter lessons.**

1. Using worksheet 1, do a shared reading activity with the students. This will allow for reading practise and breaking down word parts to read the larger words. Along with the content, discussion of vocabulary words would be of benefit for their comprehension.

Some interesting vocabulary words to focus on are:

- | | |
|--------------|--------------------------|
| • depend on | • sheltered |
| • ecosystem | • moss |
| • particular | • community |
| • contain | • biological environment |
| • habitat | • moist |
| • climate | • physical environment |

2. Give each student worksheet 2, a magnifying glass, and clipboard and pencil. Take them out into the school yard or to a neighborhood park to look for living things. (Remind students to be respectful of a living thing’s habitat, by leaving it just as they found it, and all things left unharmed.) Encourage students to notice the different types of trees, plants, animals, birds, and insects. Pose this question as they look, ‘how are the living things using their habitat and sharing the space?’ *An option is to give students iPods or iPads to take photos of the different living things that they see.*
3. Upon returning, engage students in a discussion about their observations, and of how the living things used and shared the habitat. Give students worksheet 3 to complete.
4. Discuss the meaning of ‘population’ with the students. Give them worksheet 4 to complete. Their data should be displayed using a bar graph.



5. Review the meanings of habitat, community, and population, with the students. At this point, it may be beneficial to do a read aloud about these concepts in order to further their understanding. A suggested book is A Tree in the Forest (Author: Jan Thornhill). During reading, ask students about the populations of certain animals that live in this area of the forest. Sample questions are:
- When the tree was 10 years old, what population of skunks lived in its area?
 - When the tree was 25 years old, what population of deer lived in its area?
 - When the tree was 70 years old, what population of chickadees lived in its area?
 - When the tree was 150 years old, what population of raccoons lived in its area?
 - When the tree was 195 years old, what population of wolves lived in its area?
6. Give students worksheets 5, 6, and 7 to complete. A follow up option is to come back together as a large group and have students share their responses about natural events that could threaten a forest habitat, and how exactly it could impact living things in it. This could generate some rich discussion and allow students to use some topic specific vocabulary.

DIFFERENTIATION:

Slower learners may benefit by working in a small group with teacher support to create a bar graph together on chart paper of the populations of living things found in their school yard or local park, thus eliminating the need to complete it individually on a worksheet. An additional accommodation would be for these learners to work in a small group with teacher guidance to discuss the questions on worksheet 6, and omitting the written expectation to respond.

For enrichment, faster learners could use modeling clay to create a three dimensional figurine of an animal that they saw in their school yard habitat, and/or of an animal they read about living in the story A Tree in the Forest.

A Habitat is a Home

All living things depend on other living things for survival. Plants and animals that live in a particular place share the same water, air, climate, and type of soil, which make up their physical environment. These plants and animals also share their physical environment with other plants and animals living there. This is the biological environment. Both environments make up the habitat of each plant and animal.

Many plants and animals that use trees and sheltered areas for their homes live in a forest environment. Birds, mice, owls, squirrels, deer, and other living things make their homes in the forest. In the forest, there are many small habitats. Animals can even be found living in tree trunks, among dead leaves, in holes, in the branches of trees, or under rocks!

Wood lice like to live under rocks or rotting logs where it is moist. The rotting log or rock is their habitat. They may share space with millipedes, moss, and other living things. Together, they all live in a community. This community is one of the many communities of living things in the forest. Living things, along with the non-living things like soil, wind, and rain, form a very large habitat or what is called an ecosystem.



Wood lice are also called sow bugs or pill bugs.

In a backyard habitat you might find living things such as robins, starlings, sparrows, squirrels, trees, plants, grass, and insects. A robin may make its nest in a maple tree and feed on earthworms. Sparrows may live in a pine tree and eat insects or seeds from a bird feeder. Short plants may grow under tall plants, and vines may grow along a fence. Moss may be growing on the trunks of trees. All these living things form a large backyard habitat that contains many smaller habitats. Are you wondering what is living in your yard? It's time to find out!



What's Living Out There?

Did you know that your own school yard is a home for many different plants and animals? Take a walk out into your yard or a nearby park. List the different types of plants and animals that you see living there.

TREES

PLANTS

BIRDS

INSECTS

ANIMALS



Draw a map of the habitat that you have investigated as though you were looking down from a helicopter, in other words, a bird's eye view.

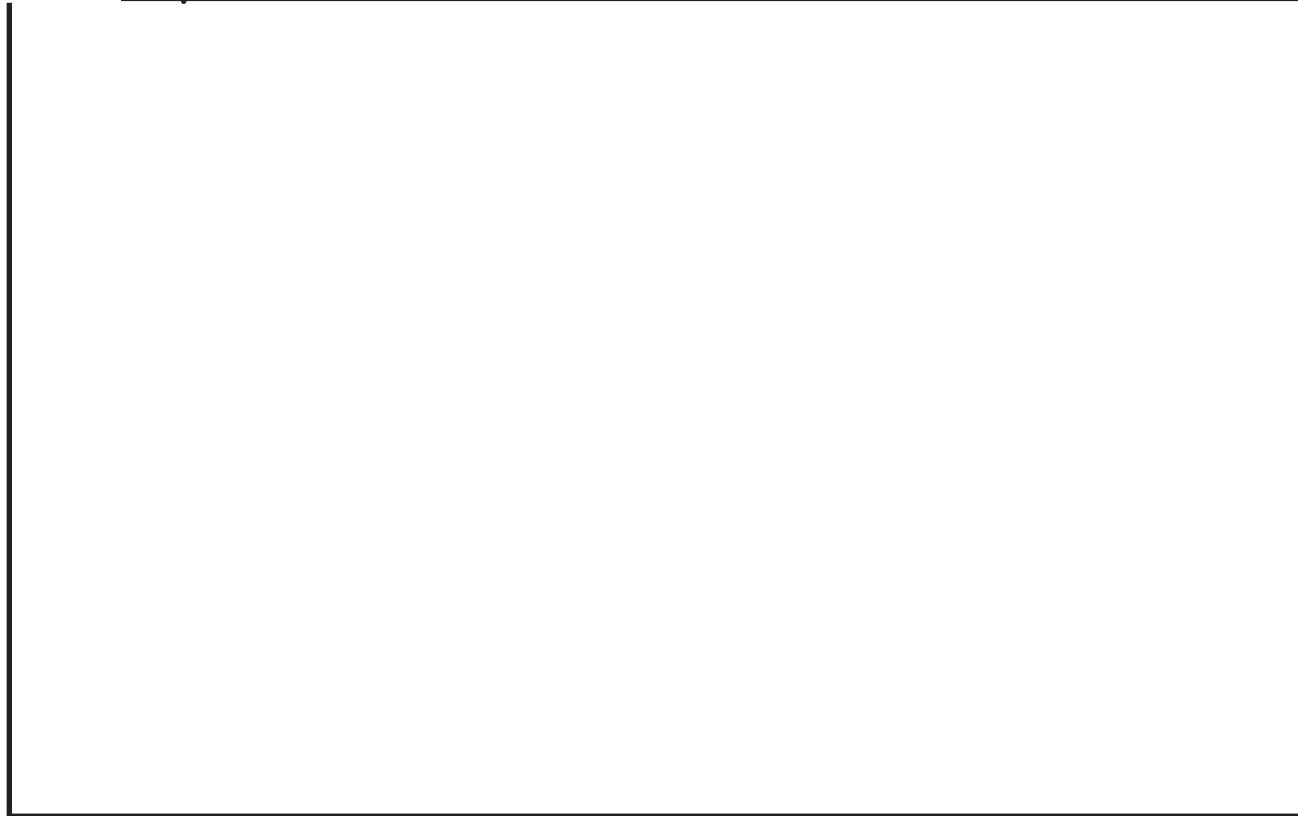


Populations

Through your investigation you found a variety of plants and animals in your school yard or neighborhood park habitat.

Look at your data on worksheet 2. Graph the number of populations of trees, plants, birds, insects, and animals that live there. For example, if you found six species of insects, you would show six in the 'insects' column.

Populations of Inhabitants Found in the School Yard



Conclusions:

A Tree in the Forest

Working with a partner, talk about the living things that inhabited the forest. Remember, living things can be plants or animals. Record your thoughts in the box below.



List the living things inhabiting the forest in the story A Tree in the Forest.

Do the inhabitants of this forest change depending on the seasons? Explain your thinking.

Explain how the inhabitants in this forest area live together as a community. (How do they depend on each other?)

Illustrate how the early settlers in the story A Tree in the Forest depended on the forest habitat.

Think**Pair****Share**

With a partner, do some thinking and sharing of ideas about natural events that can threaten a community living in a forest habitat. Record your ideas.

