

Early Learning STEM Lessons

Unit 4: Discovering Plants and Animals

This unit was developed by the Bremerton School District in partnership with the Office of Superintendent of Public Instruction and funded through grants from the Boeing Company and EPA Region 10 to support Early Learning STEM Education. The Early Learning STEM units are designed for educators, teachers, and childcare providers to use with children between the ages of 2-5.



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Objectives

- Children will discuss and explore ways things are living or non-living, living things and their habitats, and the way things change in nature (life cycles and/or seasons).
- Children will use sorting and reasoning in their recording.
- Children will use their senses to make observations about materials and the environment; and compare/contrast.

Common Misconceptions

- *Only furry things are animals.* Some children have a limited view of what an animal is; that only farm animals or pets are animals, or only creatures that are warm and furry are animals. Children may think that insects, spiders, fish, and humans are not animals.
- *Plants are not alive.* Children may believe that because plants cannot move independently, do not have a mouth to eat, or breath through a nose, they cannot be alive.
- *If something is in the dirt, it is alive.* Children may overgeneralize the concept of plants being alive and extend it to nonliving objects such as rocks because they 'grow' in the dirt.
- *Bugs/dirt/snakes/mud/etc. is icky.* While not technically a misconception, children can pick up on the fears and insecurities of the adults around them and perpetuate those thoughts. Take care to hide any fears about certain critters or environmental elements as children may overgeneralize and/or develop a fear because they know you are.

Target Books

Nonfiction (informational text):

- Planting A Rainbow by Lois Ehlert
 - A child tells a story of planting a rainbow, selecting different types of plants and flowers to represent the different colors. Descriptions of bulbs, seeds, seedlings, and plant starts demonstrate the various beginnings of plants.

Fiction:

- In the Tall, Tall Grass by Denise Fleming
 - Expressive vocabulary is used to describe animals that a little boy finds while exploring in tall grass. Rhyming text briefly describes actions, sounds, and sights that are exhibited by the critters and surroundings.

Key Vocabulary

- **Living** – something that eats, grows, and makes offspring.
- **Non-living** – something that never was or will be alive.
- **Life cycle** – the way something grows and changes.
- **Habitat** – where something alive lives, eats, and travels.
- **Nature/Environment** – outdoors; where and how things live.
- **Garden** – where people grow plants; might include vegetables and fruits for us to eat.
- **Record** – to draw or write about what you see, touch, smell, hear, and feel.

- **Observation** - to pay attention to something and record it.

Pre/Post Assessment Ideas

- Give a set of pictures that include things that are alive and not alive. Ask the child to sort based on living and not living.
- Ask if a plant is living or nonliving. If they are living, what do they need to grow? How do they grow?
- What do animals need to live? Show picture of different types of animals. Ask about where they live, why, and how they get their needs met.

Before Reading

- Introduce key vocabulary.
- Take a 'picture walk'-look through the pages and talk about what they see and think the story may be about; when appropriate, have children make predictions about what they think may be happening on a page.
- Record predictions that children make during their picture walk.
- Record what children already know about the topic, a circle map can be an excellent recording tool - examples are at the end of the unit.

During Reading

- Make comments about personal connections, either between you and the story or the children and the story.
- Ask questions that are:
 - "On the page"- basic level questions that have yes/no answers or can be answered by looking at the page.
 - "Between the lines" - a higher level of questioning that requires children to recall information they have already heard or information they are hearing right now in order to answer.
 - "Beyond the book" - an even higher level of questioning that requires children to take information they have previously heard and make reasonable predictions based on that known information.
- A single page of key vocabulary and a variety of types of questions specific to each book is included with the unit. It is recommended that you print this page and keep it with your book copy to serve as a reference guide when engaging with the book with young children.

Book Extension

- Plant a garden (you can use pots and planters inside if no outdoor space available).
 - Help children draw the outline of the garden plot or the shape of the planters.
 - Have pictures of a selection of plants, both ones that are feasible and not feasible for planting in your area. With each picture, include a basic description of the type of environment and space that will be needed. Some samples are included at the end of the lesson.

- Let the children explore the different pictures of the plants and their needs, teaching them how to decode the symbols of the type of environment and space needed for each.
- Let children select the plants that they feel would work best for their garden or planters. They will need to work together to decide which plants. Help children develop rationalizations for why they did or did not select the plants. For example, if planting an indoor garden, one of the pictures might be of an apple tree. The mature size of the tree would not be possible to maintain in an indoor planter box.
- Use unifix cubes, links, string, or other nonstandard units of measurement to measure how deep the seeds should be planted and how close together.
- Help children make labels for the different seeds/plants they selected. Popsicle sticks or wooden paint stirrers from the hardware store make great inexpensive markers. Children can copy or trace the word onto the wood and draw a picture of the mature plant or of the fruit/vegetable.

Discussion Points

- When planning the garden with the children ask what a plant needs and how can we make sure they get that. When planting ask them to use their senses; what does the dirt feel like, etc. and to predict when we might see sprouts? When harvesting ask them what does the plant look, feel, smell, taste (when appropriate) like.
- When flowers are available you could dissect one of them to look at the different parts and speculate what they might do. Which part might attract bees and why?

Additional Activities

Small/Large Group Activities:

- **Make a classroom book:**
 - Use child drawn pictures of their process for gardening and their observations for the Nature Walk.
- **How things grow and change (Life cycles):**
 - Have pictures of animals and plants that change over time for each stage or better yet grow them in your classroom. Butterflies or tadpoles are some examples for animals. Have them sort the process. Observe the rings inside trunks for number of years the tree has lived or how leafy trees shed leaves or light green new growth needles on pines.
- **Living and nonliving-picture/object sort, characteristics of living things:**
 - Have children sort through various pictures of things that are alive (plants and animals), and things that have never been alive (plastics, rocks, dirt, sun, moon, water, fire, etc.). Note: You might add things that were alive at one time (wooden table, foods we eat, paper, etc.) especially if you have talked about life cycles and do not find the subject morbid.
- **Sprouts:** Add bean sprouts to baggies or grow different plants in a Rootvue to watch their roots grow.

- **Picking sensory plants:** soft touch mosses, aromatic herbs like mint or rosemary, colorful flowers of different sizes and shapes (include bold flowers that could be taken apart to look for different parts of a flower; petal, stamen, pistil, and sepal), and veggies that could be eaten later in a nutritional activity.
- **Plant variety:** Planting many of the same type of plant and grow them in different environments, predict, measure, and chart: light/dark, varying degrees of water, different types of soil.
- **Plant Walk:** Taking clipboards (made from cardboard with rubber bands are inexpensive to make and replace) outside on a walk, draw pictures of what you see that is alive, where their habitat is, and what they eat if you can (some might be speculation or based on previous knowledge).
- **Dig in the dirt:** Take a trowel, dig into the dirt, and make the above observations.
- **Post word and pictures:** Write words for the children underneath their pictures and post them in the classroom possibly near the science area or next to the window or as a book available in the library.
- **Have students write their own classroom book:** If you have access to water you might check local fish runs or go after water bugs then make your own classroom book, “In the Cool, Clean Water” or a forest and write “In the Tall, Tall Trees”, use your imagination for a local backyard or easy access habitat.
- **Sorting:** Sort other living things by their habitats-things that live in trees/water/on the ground/in the ground, etc.

Block Area

- Build habitats for animals using blocks and other materials you have placed in the block area.

Meal/Snack Conversations

- Talk about the different food that children are eating. Are there other animals that eat those foods? Are their things animals eat that we don't eat?

Outdoor Component/Active Movement

- Put on music and have children imitate different animal movements. You can use a grab bag with either pictures of animals or figurines and let children reach in to determine the next movement.
- When walking from one location to another, imitate different animal movements (e.g. stomp like an elephant, take big steps like a giraffe, etc.).
- Observe different animals outside. Go on a bug hunt and see what types of bugs you can find. Bring an observation book with you and record your findings.
- Go on a tree hunt. Have pictures of different trees that are found nearby outside and help children find all the trees on their paper.
- Compare and contrast different leaves and plants that are found outside.
- Use hula hoops to do a sort of different things that are found in the playground
 - Items can be sorted by texture, alive/not alive, rocks/leaves/twigs, or any other combinations that you and children may come up with.

- Plant different plants. Compare the different roots as they are put in the ground. Dig up other plants nearby (dandelions, grass, and other weeds) and compare their roots.

Assistive Technology

Assistive Technology is the use of strategies, adaptations, materials which are created or commercially available products to enable participation in activities that otherwise would not be accessible. While these strategies are designed to assist those with disabilities and/or other barriers to learning, they can be implemented with all children, including those who are not native English speakers, and provide additional visual and technological support.

For this Unit:

- Add visual/picture supports for each of the block types you are using:
 - Clip art available as sticky notes for some children to choose rather than drawing or writing their observations.
 - Clip art or objects for each shape you are searching for, the shapes can be matched to photos of the actual objects that are observed.
 - Clip art or other symbols or objects for each building type to answers to questions about which sense was being used.
- A communication device programmed with key words, vocabulary as well as words that could answer questions about the senses or observations. This could be used to participate in discussions, answer questions, and request items.
- If any digital stories were created, use a switch connected with a switch interface for any child to view the story.
- Create a spinner attached to a switch so a child can participate in selecting living and non-living items for others to categorize. The same spinner can be adapted for use with the math game that is provided.
- Create an electronic interactive word wall: This is created using PowerPoint. Each letter in the first slide is a hyperlink to the corresponding alphabet page. At the bottom of each alphabet page are links to return to the main screen or go forward to backward a page. Children can assist with the creation by choosing pictures and suggesting words to be added.

WORD WALL

<u>Aa</u>	<u>Bb</u>	<u>Cc</u>	<u>Dd</u>	<u>Ee</u>	<u>Ff</u>
<u>Gg</u>	<u>Hh</u>	<u>Ii</u>	<u>Jj</u>	<u>Kk</u>	<u>Ll</u>
<u>Mm</u>	<u>Nn</u>	<u>Oo</u>	<u>Pp</u>	<u>Qq</u>	<u>Rr</u>
<u>Ss</u>	<u>Tt</u>	<u>Uu</u>	<u>Vv</u>	<u>Ww</u>	<u>Xx</u>
<u>Yy</u>	<u>Zz</u>				

e			I see with my eye.
	Eye		
e			I can hear with my ear.
	Ear		
e			

Other Resources

- **Teacher Resources**

- Discovery Education – www.discoveryed.com is an online resource that offers a wide variety of digital media content into classrooms. This allows for increased engagement of children and gives them the opportunity to explore and experience fascinating people, places, and events. All content is aligned to state standards, can be aligned to custom curriculum, and supports classroom instruction.
 - Do a digital story using Photo story or PowerPoint using the pictures from the classroom book. Under the Teacher Resources

there are tutorials on creating stories using Photo Story which comes with Microsoft. There are multiple tutorials plus completed projects.

- Animal Alphabet uses video of real animals for each letter of the alphabet; videos: Wild By Nature for Kids.
- Use Photo Story or PowerPoint to document the life cycles of each stage.
- BookFlix – <http://bkflix.grolier.com> is an online literacy resource that can be purchased through Scholastic and is geared for children up to approximately third grade. Over 100 pairs of fiction and nonfiction books are included, with the fiction book being animated and the nonfiction in a read-a-long format. BookFlix includes games or puzzlers, a meet the author section, web resources, and teacher lesson plans.
 - The table below shows the pairs of fiction and nonfiction books available on BookFlix.

Fiction	Non-Fiction
Antarctic Antics	Antarctica
Bear Snores On	A Bear Cub Grows Up
Bugs, Bugs, Bugs	A Ladybug Larva Grows Up
The Caterpillar and the Polliwog	A Tadpole Grows Up
Curious George Rides a Bike	Monkeys and Other Mammals
The Day Jimmy's Boa At the Wash	Snakes and Other Reptiles
Diary of A Fly	Flies Are Fascinating
Diary of a Spider	A Spiderling Grows Up
Diary of a Worm	It could Still Be a Worm
Giggle, Giggle, Quack	Living on Farms
The Great White Man9Eating Shark	A Shark Pup Grows Up
In The Small, Small Pond	Life in a Pond
Is Your Mama a Llama?	Animal Babies
Joey Runs Away	A Kangaroo Joey Grows Up
Lon Po Po	Wolves
Rosie's Walk	A Chick Grows Up
Owen	Mice
Owl Moon	Owls and Other Animals with Amazing Eyes
Swamp Angel	A Home in the Swamp
The Three Little Pigs	Pigs
Why Mosquitoes Buzz in People's Ears	Mosquitoes
Waiting for Wings	Butterflies
Scaredy Squirrel	Squirrels
Miss Rumphius	From Seed To Dandelion
Planting a Rainbow	It Could Still Be a Flower
Goldilocks and the Three Bears	A Garden Full of Sizes

Sample Circle Map

