

Environmental Literacy Unit Plan

Grade: Early Childhood

Title: *The World Around Us*

Authors: Courtney Chicoye, National Children's Center; Claudette Kumar, Kiddies Kollege; and Kathy Taylor, CentroNia

NGSS Unit Plan

Title of Unit	The World Around Us	Grade Level	Pre-K
Curricular Theme	<i>Scientific Inquiry</i>	Time Frame	30 minutes daily 10 days
Essential Question(s) to be Addressed	What can we learn about the environment using our five senses?		

Background Information and Context

NGSS Performance Expectations:

- PreK-LS1-1. Observe and categorize living and non-living things.
- PreK-LS1-1. Observe (collect, record, and share) and identify the characteristics and needs of living things.

Applicable Common Core Standards (CCSS ELA and CCSS Math)

ELA/Literacy

- **5a.** Ask and answer questions in order to seek and offer help, get and offer information, or clarify something that is not understood.
- **5b.** Demonstrates understanding of spoken language by responding appropriately.
- **6a-e.** Uses new vocabulary in everyday speech to meet own needs and to explain, describe, and manage social relationships; expresses thoughts, feelings, and ideas verbally; with guidance and support, generates new words; applies words learned in classroom activities to real-life situations; and uses words and phrases acquired during conversations by listening to stories and informational text read aloud.
- **11a-b.** Phonological awareness/phonics; and word recognition.
- **24a.** Participates in music, movement, and drama activities and expression.

Mathematics

- **14.** Matches, groups and classifies objects and patterns; and demonstrates knowledge of numbers and counting.

Prior Understandings

- Use of the five senses and their functions.

Community Connections: Sustainability Initiative

- Nature walk near school (e.g., gardens)
- Field trip to Rocklands Farm. Students will have a hands-on experience by observing a compost heap along with encouragement through open-ended questions/responses about the importance of worms in their environment.

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Disciplinary Core Ideas: (Students will know...)

- Living things such as animals, plants, and people obtain food they need from plants or other animals in order to grow.
- Plants need water and light.
- Non-living things such as toys and playground equipment do not grow (i.e., get bigger or taller).

Science and Engineering Practices: (Students will...)

Know how to observe to identify patterns in characteristics and behavior leading to needs; build on prior experiences and progresses to collecting, recording and sharing observations.

PreK-LS1-1. Developing and Using Models. Create a worm bin to compost worms.

Engineering:

- Constructing Explanations and Theories: Use shredded newspapers, fruit and vegetables, moist soil. Explain each feature of the worm bin and how it contributes to a functional worm farm.
- Obtaining, Evaluating and Talking about Information: Document experiences and communicate with other students and visitors. Look for and describe patterns.
- Planning and Carrying out Investigations: Use their senses and simple tools to observe, gather, and record data (e.g., magnifying lens, dictate, draw, or photograph).

Crosscutting Concepts: (Students will connect...)

The students will have a better knowledge that not all living things have all five senses. With patterns, prompt questions about relationship between living and non-living things. The students will also investigate needs of various living things.

- **LS1.A.** Structure and Function: Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place and seek, find, and take in food, water and air. (PreK-LS1-1)
- **LS1.B.** Growth and Development of Organisms: Plants and animals grow and change. (PreK-LS1-3)
- **LS1.D.** Information Processing: Animals have body parts that capture and convey different kinds of information needed for growth and survival for example, eyes for light, ears for sounds, and skin for temperature or touch. (PreK-LS1-4, PreK-LS1-5)
- **LS2.A.** Interdependent Relationships in Ecosystems:
- Animals depend on their surroundings to get what they need, including food, water, shelter and favorable temperature. (PreK-LS2-2)
- **PreK-LS3-2.** Use observation to recognize differences and similarities among themselves and their friends.

Performance Task

Performance Task Description

(Note: the performance task should include elements from the three dimensions from the NGSS (both knowing and doing))

The students will create a journal of seven pages about worms in their environment. This will be created in the classroom during their study, including drawings, photos, and diagrams and their responses to these questions. The sections of the journal should be:

- What are the three things the students know about worms? (How does the worm feel? Is it smooth, bumpy, slimy, furry, wet, and/or dry? What color is the worm?)
- What do worms eat?
- Circle (given the five senses pictures) what senses children and worms have and make a compare/contrast chart.
- Paste pictures of egg cases, hatchlings, young worms, and adult worms in order from egg to adult on the given format.
- How is a gummy worm different from an earthworm?

The students will also be able to share/explain the findings of their journal with their parents, peers, other teachers in their school and local helminthologists.

Goal	To learn about our environment through using our senses and observing the life of a worm.
Role	Students play the role of zoologists, helminthologists, gardeners, and farmers.
Audience	Children in the classroom, other young children, parents and helminthologists.
Situation	Encourage other children and parents to encourage worm growth.
Product/Performance	A worm journal.
Other Evidence	Students make presentations of their journals during a visit from the helminthologist and families.

Grouping Strategies	Materials and Equipment Required
3 groups of five students	<ul style="list-style-type: none"> • Journals: construction paper, crayons, pencils, assorted colored pencils, markers, camera, stapler, glue sticks, and pictures (see EC-ELSI-NGSS-Resources) • Materials for maintaining worms (vermicomposting): scraps of fruit and vegetables, coffee waste, tea bags,

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	<p>moist soil, and shredded paper</p> <ul style="list-style-type: none"> Worm bins (See Resources excel file): at least 2 plastic bins, hand drill (boxes should be opaque. Have students draw pictures or bring in material scraps to make "curtains.")
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Learning Plan/ Instructional Sequence

5E Stage: Engage

Lesson Title: The World Around Us: Using Our Five Senses

Science/Engineering Practice or Crosscutting Concept: (K-ESS2-1) Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.

Teacher does:

- Provide instructions for task and what students will be observing.
- Collect books pertaining to worms and the five senses in the library center and set out for the students to read.
- Engage the students in a finger play and introduce a rap song about worms.
- Ask open ended questions: What do you see? How does it feel? Where is its head? Which body parts does it have? What do you already know about them?

Students do:

- Search/feel for worms and soil in the school garden.
- Paint worms and then paint *with* worms.
- Answer open-ended questions.
- Be interactive and learn song and finger play about worms.

Evidence of learning:

- Students can tell some facts about worms.
- Students can describe how a worm travels.
- Students can explain that worms have soft bodies and so we need to use a gentle touch.
- Students can identify what body parts a worm has.

Common Core Connections:

- Demonstrate knowledge of the characteristics of living things.

5E Stage: Explore

Lesson Title: The World Around Us: Using Our Five Senses

Science/Engineering Practice or Crosscutting Concept: Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)

Teacher does:

- Asks: What do worms eat? Do they eat/taste the soil, scraps of food, etc.?

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- Lead a nature walk and ask: What might you find? Why do you think worms are deep in the dirt?
- Ask open-ended questions and write down the students' responses.
- Give students a ruler, measuring tape, and measuring cup and document responses.
- Take pictures with camera to record students' performance.
- Direct the students to compare the sounds of worms, if any, in their habitat and on paper.
- Set up 3 stacking vermicomposting bins.
- Divide the children into 3 groups of five students and give instructions on how to make a worm bin.
- Instruct on safety of using a hand drill---or use the hand drill to drill holes in the bins as a demonstration for the children.
- Distribute shredded paper, soil, food waste, and worms to each group.
- Have the children tear or cut newsprint into strips.
- Encourage children to bring in fruit and vegetable scraps from home.

Students do:

- Go on a nature walk and dig a hole in the ground in search for worms.
- Test the odor of the worms by smelling them in their habitat.
- Feel the soil and worms and specify their textures.
- Test the temperature using a thermometer to see if the habitat is hot, warm, or cold.
- Observe and measure the length of the worm.
- Compare the sound of the worms while moving in the soil or on paper.
- Work in groups.
- Each group gets shredded paper, soil, food waste, and worms.
- Follow the teacher's directions and add layers of paper, food waste, moist soil, and worms to the worm bins.

Evidence of learning:

- The students will be able to draw a graph of their observations of the lengths of the worms they study.
- When digging in the soil they will be able to identify a worm.
- They will be able to identify the instruments (ruler, tape measure, etc.) used in the activity.
- The students will be able to sequence photos of themselves performing activities in order (e.g., steps in building the worm bin, steps in preparing the compost).

Common Core Connections:

Observe living things and their needs.

5E Stage: Explain

Lesson Title: The World Around Us: Using Our Five Senses

Science/Engineering Practice or Crosscutting Concept: Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)

Teacher does:

- Ask the students what senses they used when completing the various activities compared to what senses the worms are using in their environment.
- Invite a helminthologist to do a presentation on worms.
- Show a video on the life of a worm using online websites such as Youtube.com, Education.com, preschoolplanit.com, or enchantedlearning.com.
- Set out preschool appropriate books from the library pertaining to worms, five senses, and living and non-living things.
- Develop a word wall with pictures and words.
- Engage students in worm rap again.

Students do:

- Sing along for the worm rap.
- Think about and discuss what the rap means.

Evidence of learning:

- Students show their understanding of worm related vocabulary through the use of props such as puppets.
- Students can describe what a helminthologist does.
- Through the worm rap the students will be able to pick out rhyming words, shake their sillies out (free choice of body movement), learn how the worm lives, tell what worms eat, name their body parts (what do they have or don't have compared to people), and tell where it lives.

Common Core Connections:

- Distinguish various types of surface materials (soil, sand, and rocks).
- Demonstrate knowledge of the characteristics of living things.

5E Stage: Elaborate

Lesson Title: The World Around Us: Using Our Five Senses

Science/Engineering Practice or Crosscutting Concept: Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)

Teacher does:

- The teacher will provide two types of worm bins on the table.
- Ask questions:
 - What is the difference in Bin A and Bin B? (Bin A has live worms in soil; Bin B has gummy worms in soil.)
 - What do you see the worms doing in each bin?
 - Does the worm have a head, arms, legs or mouth?

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- Do the worms prefer a dry soil or wet one?
- Are the worms in each bin living or non-living?
- Over time, are there the same amount of worms in the bins, did the number increase, decrease or did the number/amount of worms remain the same?
- Encourage the students to compare and contrast their observations over a period of time, counting the amount of worms in each bin.
- Record students' answers.

Students do:

- Categorize/sort pictures in groups of living and non-living things on poster board.
- Compare and contrast two types of worm bins: worm movement in Bin A and Bin B, worm color, reaction to light, and their textures.
- Make observations.
- Take part in a graph activity to identify living and non-living things from counting worms that grow or don't grow.

Evidence of learning:

- They will be able to make a distinction of the concepts more or less using various materials in the classroom and putting them in a pile.
- Be able to draw the length of the worms, how the worms move through the soil.
- Be able to categorize and sort pictures of living and non-living things either by circling picture on paper or pasting pictures.

Common Core Connections: Represents scientific thinking and knowledge by drawing, dramatizing, and making models.

5E Stage: Evaluate

Lesson Title: The World Around Us: Using Our Five Senses

Science/Engineering Practice or Crosscutting Concept: Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)

Teacher does:

- Check that the students are using tools properly for observing, constructing, and measuring.
- Look for evidence of the knowledge of the topic used by the students in various centers.
- Ask the students: Why are worms important to the environment? Key point: Worms aerate the soil which improves irrigation.
- Encourage children to use a graph to compare if the computer, cup, plate, or ruler grew.

Students do: (no entry)

Evidence of learning:

- The students will be able to carry conversations using new vocabulary words pertaining to worms.
- The students will be able to express their reasons why worms are important through drawings and conversations.

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Common Core Connections:

Communicate with others about discoveries.

Rubric

This rubric is based on the information the child records in his worm journal stated in the performance task. Based on a numbering scale from 1-3 (3 being the highest: the student understood; 2 being moderate: the student understands half of the information; 1 being the lowest: student did not understand; he or she did not attempt work or needs a lot of help.

Student's Name:			
Drawing a picture			
• How close is his/her drawing to the real worm?	1	2	3
Naming body parts			
• Can the child name the parts he/she has versus what a worm has?	1	2	3
• Can the child name the parts that a worm does not have when singing/listening to the worm rap?	1	2	3
Vocabulary			
• Can s/he fill in the picture word that is missing in the sentence?	1	2	3
• By looking at a single picture relating to worms, the student will identify/recognize the initial sound in each word picture.	1	2	3
• How well does s/he chart their findings with pictures by circling, marking with an "X" and matching?	1	2	3
Observations, Compare and Contrast			
• Student can describe how a worm reacts to its environment using its senses.	1	2	3
• Student can describe how worms and humans are similar in the way they sense the environment.	1	2	3
• Student can describe how worms and humans are different in the way they sense the environment.	1	2	3
Living and Non-living			
• Can s/he identify living and non-living things tracking observations recorded in the journal?	1	2	3

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Universal Access

Supporting English Language Learners

Reading, Writing or Speaking Activity <i>(listed in Learning and Instructional Sequence)</i>	Supports for <u>Emerging</u> learners?	Supports for <u>Expanding</u> learners?	Supports for <u>Bridging</u> learners?
Engage students in a finger play and worm rap (song and movement).	<ul style="list-style-type: none"> Follow one-step oral directions (e.g., "stand up"; "sit down"). Respond with gestures to songs, chants, or stories modeled by teachers. Match pictures, objects, or movements to oral descriptions. 	<ul style="list-style-type: none"> Sing repetitive songs and chants independently. 	<ul style="list-style-type: none"> Create content-based representations through pictures and words. Find school-related vocabulary items.
Create a worm journal.	<ul style="list-style-type: none"> Sort pictures or objects according to oral instructions. 	<ul style="list-style-type: none"> Retell narrative stories through pictures with emerging detail. Draw pictures and use words to tell a story. Order a series of labeled pictures that were described orally, to tell stories. 	<ul style="list-style-type: none"> Indicate features of words, phrases, or sentences that are the same and different. Explain situations (e.g., involving feelings). Make "story books" with drawings and words.

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Supporting Struggling Learners

Activity <i>(listed in Learning and Instructional Sequence)</i>	Supports for Students who need <u>Minor</u> Support	Supports for Students who Need <u>Intensive</u> Support
Compare and contrast the 2 types of bins (gummy worms and live worms). How are they the same or different?	Engage them for opportunities to have social interactions with other children to develop language skills through shared book reading and teacher talk.	Help them understand the difference between “same” and “different” by reviewing terminology, using picture cards and props. For example, compare a real butterfly to a plastic butterfly in the classroom.
Engage students in a finger play and worm rap (song and movement).	<ul style="list-style-type: none"> The teacher will provide beginning sign language when singing the rap. 	<ul style="list-style-type: none"> Encourage children with less participation skills or delayed speech or extreme shyness. The teacher will provide hands over hands assistance when singing/actions. To encourage phonological awareness, the teacher will help students recognize beginning sounds of words pulled from the song.

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Supporting Advanced Learners

Activity <i>(listed in Learning and Instructional Sequence)</i>	Extensions for Advanced Students
Develop a word wall using pictures and words.	<ul style="list-style-type: none"> Students can choose a word from the word wall and communicate the meaning through role play.
A helminthologist visits the classroom.	<ul style="list-style-type: none"> The students can tell what a helminthologist does and record their thoughts by drawing pictures and having a "show and tell."

Connecting to the Core: NGSS Aligned Performance Tasks

ELA Connections <i>(Reading, Writing or Speaking Activities) listed in Learning and Instructional Sequence</i>
<ul style="list-style-type: none"> The students will learn different and new vocabulary that the activity presents such as: worms, helminthologist, habitat, dirt vs. soil, aerate, compost, fertile, journal, etc. Books for Pre-K readers will be available that pertain to worm growth, worm survival, and the five senses. Students will record their observations and chart through drawings and journal writing. Open discussions within groups will be encouraged for students to exchange their different views about their experiences. The students will communicate their "compare and contrast" of the senses used by worms and by people.
Math Connections <i>(listed in Learning and Instructional Sequence)</i>
<ul style="list-style-type: none"> Students will sequence pictures from the storybooks they read and will sequence cards. They will measure amount of dirt used for experiments using cups. The length of the worms can be measured using the students' fingers, cubes, string, tape and paperclips, perhaps introducing the term "units" gaining the experience that length can be described in different, although equivalent, ways. Fingerplays about worms can be conducted using numbers to reinforce counting and number recognition. The balance scale will be used to weigh the soil and waste food used and the worm compost that is produced.