Englewood Public School District
Science
Grade 2
First Marking Period

Unit 1: Relationships in Habitats

Overview:
In this unit of study, students develop an understanding of what plants need to grow and how plants depend on animals for seed dispersal and pollination. Students also compare the diversity of life in different habitats. The crosscutting concepts of *cause and effect* and *structure and function* are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in *planning and carrying out investigations* and *developing and using models*. Students are also expected to use these practices to demonstrate understanding of the core ideas. This unit is based on 2-LS4-1, 2-LS2-1, 2-LS2-2, and K-2-ETS1-1.

Time Frame: 15 to 20 days

Enduring Understandings:
There are many different kinds of living things in any area, and they exist in different places on land and in water.
Plants depend on water and light to grow.

Essential Questions:
How does the diversity of plants and animals compare among different habitats?
What do plants need to live and grow?

Standards	Topics and Objectives	Activities	Resources	Assessments
(2-LS4-1) **Make observations of plants and animals to compare the diversity of life in different habitats.**	**Topics** Plants and Animals Twenty-First Century Themes and Skills include: Environmental Literacy • The Four C's • Environmental Literacy • Global Awareness **Objective** Students will make	Habitat in a Bucket: Students find out firsthand by exploring a "habitat in a bucket" that includes outdoor habitat items (e.g., leaves, branches, snails, etc.) that have been collected and brought into the classroom. Students use the exploration as an inquiry starting point. They make observations, generate questions of interest and design and conduct their own investigations. Typical	**Materials:** • Large tub or bucket • Items from a habitat or habitats such as under a pine tree, the edge of a pond, a flower garden, beach wrack and sand, etc. Items may include leaf litter, compost, dirt, rocks, twigs, seeds, leaves, small animals and insects, evidence of animals, such as feathers, snake skin, etc.	**Formative Assessments**: Do Now/Ticket to Leave Journal Entry Students will make observations to construct a measurable question to design an investigation. **Benchmark Assessment**: Exact Path

	observations of plants and animals to compare the diversity of life in different habitats.	investigations might focus on plant and animal interactions, food chains, physical and behavioral adaptations of living things and biodiversity. (8.2.2.C.1,W.2.8, W.2.6, CRP4, CRP8, MP.4)	• Tools for exploration: hand lens, unsharpened pencil, white paper plate, clear plastic cups • Paper towels, spray bottles, shoebox lids, Q-tips, flashlights, string • Foods, such as dry oatmeal, apple slices, carrots • Different surfaces, such as sand paper, construction paper, Plexiglas, foil, wax paper, carpet, artificial turf • Science notebook for each student **Lesson Resources:** www.montereybayaquarium.org **Suggested Books:** An Earthworm's Life and A Pill Bug's Life. Himmelman, John. Children's Press, 2000. I Took a Walk. Cole, Henry. Greenwillow Books, 1998. One Small Square—Backyard. Silver, Donald. Learning Joy Press, 1993. Rolypolyology; Snailology; Spiderology; and Wormology. Ross, Michael Elsohn. Carolrhoda Books Inc., 1995-2004.	**Summative Assessments**: An example investigation for "How far can a snail move in 10 minutes?" may include isolating a snail at one end of the habitat, marking its starting point with a rock and timing it for 10 minutes. Examples of observations could include the types of plants, types of animals, types of soil, similar animals or plants in different buckets, type of ground material

(2-LS2-1) **Plan and conduct an investigation to determine if plants need sunlight and water to grow.**	**Topics** Plants Twenty-First Century Themes and Skills include: Environmental Literacy • The Four C's • Environmental Literacy **Objective** Students will explore the importance sunlight for a plant's survival by conducting an investigation.	Do Plants Need Sunlight?: Each group of students will cover parts of plants' leaves with black construction paper and make observations of the plant's leaves over several days. This lesson serves to model the process of investigation. The investigation will take 7 days to complete. Then students can remove the black paper, place the plants back in the sunlight, and view the leaves in a second investigation. (Chlorophyll is not a necessary concept/vocabulary term to address in this lesson.) (RI.2.1, W.2.7, CRP6, MP.5) **Extension Activity:** Have the students place a shoebox over a grassy area. Secure shoebox in place with a rock. Each day for five days, have the students take a look at the grass and make observations. After seven days, ask students how the grass is similar to the leaves from their experiments. What connections can be made about plants and sunlight? Who Needs What? Students identify the physical needs of animals. Through classroom discussion, students speculate on the needs of plants. With	Salamander Rain, Pratt-Serafini, Kristin Joy. Dawn Publications, 2000. **Materials:** • A green plant with healthy green leaves • Paper clips • Black construction paper **Web-based Lesson Plan:** Who Needs What? https://www.teachengineering.org/lessons/view/duk_sunflower_mary_less	**Formative Assessments:** Do Now/Ticket to Leave Journal Entry Students will display their knowledge of the sunlight and plants through class discussion and conclusion sentence. Students will make observations (firsthand or from media) to collect data that can be used to make comparisons. **Summative Assessment**: Do Plants Need Sunlight Activity **Alternative Assessments:** Students will look for patterns and order when making observations about the world. Students will observe patterns in events generated by cause-and-effect relationships. Students will plan and conduct an investigation collaboratively to produce data to serve as a basis for evidence to answer a question. Students will describe how the shape and stability of structures are related to their

		teacher guidance, students then design an experiment that can take place in the classroom to test whether or not plants need light and water in order to grow. (8.1.2.B.1, 8.1.2.E.1, W.2.6, NJSLSA.R7, 8.2.2.A.1)	Teach Engineering	function. Students will be evaluated based upon their weeklong experiment and the quality of the data in their science journal.
(2-LS2-2) **Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.** **(K-2-ETS1-1)** **Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.**	**Topics** Plant Pollination Twenty-First Century Themes and Skills include: Environmental Literacy • The Four C's • Environmental Literacy **Objective** Students will create a model to replicate seed dispersal or plant pollination. **Part Two:** Students will design and measure their individual vanilla bean pollinators. The class will evaluate each design for its effectiveness and will chart the data.	**Vanilla Bean Pollinators:** **Part 1:** Students will brainstorm and design a vanilla bean pollinator after viewing a video, previewing building materials and additional research. (2-LS2-2) The Bug Chicks-Mission: Pollination (Episode 5): The Bug Chicks' five minute video provides a fun, animated way of learning about the fascinating world of pollination and insects. In this video, the students observe interesting museums and habitats to look at lesser-known insect pollinators. The student challenge at the end leads students into their environment to look for other pollinators and encourages them to bring their observations back to the classroom to discuss. (6.1.4.B.5, MP.2) **Part Two:** **Materials:** • Pile of Materials--Ready For Action! - Craft pom	**Part 1 Materials:** **Materials:** • Vanilla Flower Photo and vanilla bean photo • Vanilla Plant Pollinator Challenge Folder Cover • Vanilla Pollinator Define and Research • Vanilla Pollinator Brainstorm • Engineering Design Process Cards • Various Materials--craft pompoms of various sizes, cotton balls, cotton swabs, toothpicks, straws, aluminum foil, wires, tape, pipe cleaners, newspaper, and anything else you can think would work well! • Vanilla flower model **Video:** The Bug Chicks-Mission: Pollination NSTA http://ngss.nsta.org/Resource.aspx?ResourceID=460 **Part Two:** Students will be assessed on their individual pollinator and the information provided on the	**Formative Assessments:** Students can participate in shared research using trade books and online resources to learn about the diversity of life in different habitats or to discover ways in which animals help pollinate plants or distribute seeds. Students can record their findings in science journals or use the research to write and illustrate their own books. **Summative Assessment**: Vanilla Bean Pollinators Activity (All parts) **Alternative Assessments**: Students can also learn to take notes in their journals order to help them recall information from experiences or gather information from provided sources. They can add drawings or other visual displays to their work, when appropriate, to clarify ideas, thoughts, and feelings.

		poms of various sizes, cotton balls, cotton swabs, sticky dots, toothpicks, straws, aluminum foil, wires, wooden beads, popsicle sticks, tape, pipe cleaners, newspaper,. • 1 tray per student pair • 1/8 c. flour for the "pollen"-- • 1/8 teaspoon measuring spoon • Model vanilla flowers- • Vanilla Pollinator's Engineer's Notebook recording sheet--1 copy per student • Vanilla pollinator measure and test recording sheet-- 1 copy per student Pollen Testing Paper (2.MD.D.10)	<u>Vanilla Pollinator's Engineer's Notebook</u> Students will develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	Students could create bar graphs that show the number of seedlings that sprout with and without watering or that document plant growth. Students could also create a picture graph showing the number of plant species, vertebrate animal species, and invertebrate animal species observed during a field trip or in a nature photograph. Students can use the data to answer simple put-together, take apart, and compare problems. Students can diagram situations mathematically or solve a one-step addition or subtraction word problems.

Accommodations and Modifications:

Students with special needs: Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. The use of Universal Design for Learning (UDL) will be considered for all students as teaching strategies are considered.

ELL/ESL students: Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://www.wida.us/standards/CAN_DOs/
This particular unit has limited language barriers due to the physical nature of the curriculum.

Students at risk of school failure: Formative and summative data will be used to monitor student success at first signs of failure student work will be reviewed to determine support.
This may include parent consultation, basic skills review and differentiation strategies. With considerations to UDL, time may be a factor in overcoming developmental considerations. More time and will be made available with a certified instructor to aid students in reaching the standards.

Gifted and Talented Students: Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.

English Language Learners	**Special Education**	**At-Risk**	**Gifted and Talented**
● Speak and display terminology ● Teacher modeling ● Peer modeling ● Provide ELL students with multiple literacy strategies ● Word walls ● Use peer readers ● Give page numbers to help the students find answers ● Provide a computer for written work ● Provide two sets of textbooks, one for home and one for school ● Provide visual aides ● Provide additional time	● Utilize modifications & accommodations delineated in the student's IEP ● Work with paraprofessional ● Use multi-sensory teaching approaches. ● Work with a partner ● Provide concrete examples ● Restructure lesson using UDL principals (http://www.cast.org/our-work/about-udl.html#.VXmoXcfD_UA) ● Provide students with multiple choices for how they can represent their	● Using visual demonstrations, illustrations, and models ● Give directions/instructions verbally and in simple written format. Oral prompts can be given. ● Peer Support ● Increase one on one time ● Teachers may modify instructions by modeling what the student is expected to do ● Instructions may be printed out in large print and hung up for the student to see during the time of the lesson. ● Review behavior expectations and make adjustments for personal	● Curriculum compacting ● Inquiry-based instruction ● Independent study ● Higher order thinking skills ● Adjusting the pace of lessons ● Interest based content ● Real world scenarios ● Student Driven Instruction ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect

to complete a task ● Use graphic organizers	understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling) ● Shorten assignments to focus on mastery of key concepts	space or other behaviors as needed ● Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community • Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies)	science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Collaborate with after-school programs or clubs to extend learning opportunities.

Interdisciplinary Connections:

ELA - NJSLS/ELA:
NJSLSA.R7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
RI.2.1: Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
W.2.6: With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.
W.2.8: Recall information from experiences or gather information from provided sources to answer a question.
W.2.7: Recall information from experiences or gather information from provided sources to answer a question.

Social Studies:
6.1.4.B.5: Describe how human interaction impacts the environment in New Jersey and the United States.

Career Ready Practices:
CRP4: Communicate clearly and effectively and with reason.
CRP6: Demonstrate creativity and innovation.
CRP8: Utilize critical thinking to make sense of problems and persevere in solving them.

Mathematics:
MP.2: Reason abstractly and quantitatively. (2-LS2-1)
MP.4: Model with mathematics. (2-LS2-1),(2-LS2-2)
MP.5: Use appropriate tools strategically. (2-LS2-1)
2.MD.D.10: Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-LS2-2)

Integration of Technology Standards NJSLS 8:
8.2.2.C.1: Brainstorm ideas on how to solve a problem or build a product.
8.1.2.B.1: Illustrate and communicate original ideas and stories using multiple digital tools and resources.
8.2.2.A.1: Define products produced as a result of technology or of nature.
8.1.2.E.1: Use digital tools and online resources to explore a problem or issue.

Integration of 21st Century Standards NJSLS 9:
9.2.4.A.1: Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
9.2.4.A.3: Investigate both traditional and nontraditional careers and related information to personal likes and dislikes.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations • Plan and conduct investigations collaboratively to produce evidence to answer a question. (1-PS4-1),(2-LS2-1) **Planning and Carrying Out Investigations** • Make observations (firsthand or from media) to collect data that can be used to make comparisons. (2-LS4-1) **Developing and Using Models** • Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2) **Asking Questions and Defining Problems** • Ask questions based on observations to find more information about the natural	**LS4.D: Biodiversity and Humans** • There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1) **LS2.A: Interdependent Relationships in Ecosystems** • Plants depend on water and light to grow. (2-LS2-1) • Plants depend on animals for pollination or to move their seeds around. (2-LS2-2) **ETS1.B: Developing Possible Solutions** • Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in	**Cause and Effect** • Events have causes that generate observable patterns. (2-LS2-1) **Structure and Function** • The shape and stability of structures of natural and designed objects are related to their function(s). (2-LS2-2), (K-2-ETS1-2) - ***Connections to Nature of Science*** **Scientific Knowledge is Based on Empirical Evidence** • Scientists look for patterns and order when making observations about the

and/or designed world(s). (K-2-ETS1-1) • Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)	communicating ideas for a problem's solutions to other people.*(secondary to 2-LS2-2)* **ETS1.A: Defining and Delimiting Engineering Problems** • A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1) • Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) • Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)	world. (2-LS4-1)