Unit 3: Plants and Animals

Content Area: **Science**
Course(s): **Science**
Time Period: **Marking Period 4**
Length: **10 Weeks**
Status: **Published**

Unit Overview

In this unit students, will focus their studies on the way plants and animals meet their basic needs. Students will observe plant structures and discover how to propagate new plants from mature plants (from seeds, bulbs, roots, and stem cuttings). Learners will observe the changes seen during plant growth and use their observations to graph and write about their discoveries. In addition, students will design terrariums and provide for the needs of both plants and animals living together in the classroom. Finally, students will explore variation in the same kind of organism, including variation between young and adults. They learn about the behaviors of parents to help their young survive. Throughout the unit students will engage in science and engineering practices by collecting and interpreting data to build explanations and designing and using tools to answer questions.

Standards

Disciplinary Core Ideas (DCI's)

K-2-ETS1	Engineering Design
K-2-ETS1-2	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.
1-LS1	From Molecules to Organisms: Structures and Processes
1-LS1-1	Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
1-LS1-2	Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.
1-LS3	Heredity: Inheritance and Variation of Traits

Crosscutting Concepts (CC's)

CCC.1.1	children recognize that patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.
CCC.2.1	students learn that events have causes that generate observable patterns. They design simple tests to gather evidence to support or refute their own ideas about causes.
CCC.6.1	students observe the shape and stability of structures of natural and designed objects are related to their function(s).

SCI.K-2.4.2	Systems in the natural and designed world have parts that work together.

Science and Engineering Practices (SEP's)

SEP.1	Asking Questions and Defining Problems
SEP.3	Planning and Carrying Out Investigations
SEP.4	Analyzing and Interpreting Data
SEP.5	Using Mathematics and Computational Thinking
SEP.6	Constructing Explanations and Designing Solutions
SEP.8	Obtaining, Evaluating, and Communicating Information

Essential Questions

Investigation 1- Grass and Grain Seeds

- What happens to ryegrass and alfalfa seeds in moist soil?
- What happens to the grass and alfalfa plants after we mow them?
- How does a wheat seed grow?
- How many different kinds of plants live in an area of the schoolyard?

Investigation 2- Stems

- How can we make a new plant from an old one?
- What grows from the nodes of a potato?
- How do we keep our cuttings alive?

Investigation 3- Terrariums

- What do plants need to live and grow in a terrarium?
- What do animals need to live in a terrarium?
- What structures or behaviors do plants or animals have that help them live in their habitat?
- How do the behaviors of squirrels help them survive the winter?

Investigation 4- Growth and Change

- How does a bulb grow?
- What parts of the plant can grow new plants?
- How do the plants in the schoolyard compare to the plants studied in class?
- What do animal parents do to help their young survive?

Application of Knowledge: Students will know that...

- A habitat is a place where plants and animals live. It provides what a plant or animal needs to live. There are many different habitats around the world.
- Adult animals can have young (offspring), and the young resemble their parents.
- Engineers learn from nature to solve human problems.
- In many kinds of animals, parents and the offspring engage in behaviors that help the offspring survive.
- Individuals of the same kind are similar but also vary.
- New plants can grow from the stems of mature plants.
- Not all plants grow alike. There are variations in structures that serve the same function. Individuals of the same kind of plant or animal are similar but also vary.
- Plant bulbs are alive and grow new structures when provided with water.
- Plants and animals live in many different environments and have structures and behaviors that help them survive. These include sensory structures (such as ears, eyes, noses) that provide animals with information about their surroundings.
- Plants and animals need food, water, air, and space, and plants need sunlight to make food.
- Plants are living organisms that need water, air, nutrients, light, and space to grow.
- Plants grow and change. Plants can produce new plants in many ways.
- Plants have different structures that function in growth and survival. Plant roots take in water and nutrients, and leaves make food from sunlight.
- Plants need water, air, nutrients, and space to grow.
- Potatoes are underground stems; potato eyes are nodes where buds grow.
- Seeds are alive and grow into new plants. Seeds need water to begin growth.
- Some parts of plant roots will grow into new plants if they are provided with water. Other parts will not.
- Wheat and other cereals that we eat come from seeds called grains.

Application of Skills: Students will be able to...

- Cut plant stems, place them in water or soil, and observe changes over time.
- Design and build a model habitat (a terrarium system) that provides for the needs of a small community of plants and animals.
- Discover the conditions that induce root growth on stems.
- Initiate the growth of a new plant from a bulb and from a root, and observe over time.
- Make observations of terrariums over time and record them on a map (a model) and class charts through drawing and writing.
- Observe what happens when young ryegrass and alfalfa plants are cut near the soil surface.

- Record observations using drawing and writing.
- Record observations, using drawing and writing.
- Sprout wheat seeds in straws and monitor growth, using a graph.

Assessments

Pre-Assessment/Survey

Investigation 1:

- Formative Assessments: Science Notebook entry, Embedded Assessment, and Performance Assessment
- Benchmark Assessments: Survey, Investigation 1 I-Check

Investigation 2 - Landforms:

- Formative Assessments: Science Notebook entry and Embedded Assessment
- Benchmark Assessments: Investigation 2 I-Check

Investigation 3 - Mapping Earth's Surface:

- Formative Assessments: Science Notebook entry, Embedded Assessment, and Performance Assessment
- Benchmark Assessments: Investigation 3 I-Check

Investigation 4 - Natural Resources:

- Formative Assessments: Science Notebook entry, Embedded Assessment, and Performance Assessment
- Benchmark Assessments: Posttest

Suggested Activities

Investigation 1

- Part 1- Lawns
    - Students plant a miniature lawn in a cup of soil- ryegrass seeds and alfalfa seeds. They draw, compare, and record the growth of the two plants over time. Students read that plants need water, air, sunlight, and space to grow.
    - Investigation time- 2 sessions
    - Reading time- 1 session
    - Writing/Reading- Science notebook entry "Growing a Lawn" and "Plant Picture"
    - Science Resources Book- "What Do Plants Need?"
- Part 2- Mowing the Lawn
    - After the two kinds of plants have grown tall, students cut the lawn plants to simulate mowing. They observe and make drawing of what happens to the two kinds of plants.

    - Investigation time- 3 sessions
    - Writing/Reading- Science Notebook Entry “Plant Picture" and "Growing and Mowing a Lawn"
- Part 3- Wheat
    - Students plant seeds of an important grain: wheat. The wheat is carefully positioned in transparent straws with piece of paper towel to provide support and water to the seeds. Students observe what happens to the plants and record changes by drawing pictures and making bar graphs.
    - Investigation time- 4 session
    - Reading time- 1 session
    - Reading/Writing:Science Notebook Entry "Growing Wheat"
    - Science Resources Book: "The Story of Wheat"
    - Video: How Plants Grow https://www.fossweb.com/video?videoID=D2881769
- Part 4- Variation in Plants and Animals
    - Students explore that diversity of plants living in an area of the schoolyard. They work in pairs to collect leaf samples from a variety of plants. The class sorts the collected leaves by kind to come up with a number of different plants sampled. They look for differences between types of plants and variation in leaves of one kind of plant. They use media to look at variation in animals.
    - Investigation time- 1 sessions
    - Reading time- 1 session
    - Assessment- 1 session
    - Reading/writing: Science Notebook Entry Answer the focus questions
    - Science Resources Book- "Variation"
    - Video: Animal Growth https://www.fossweb.com/video?videoID=G3723103

Investigation 2

- Part 1- Rooting Stem Cuttings
    - Students try to make new plants from the stems of mature plants. Each student works with a part of a plant-a stem, a leaf, or a stem and leaf. They put the parts into water and observe them over time. Students draw and describe in words what they observe.
    - Investigation time: 3 sessions
    - Reading/Writing: Science Notebook Entry- Stem Cuttings
- Part 2- Spuds
    - Students cut potatoes (modified stems) into pieces and plant them in soil. After 2-3 weeks, students observe the results and discuss the role of potato eyes in producing new plants.
    - Investigation time: 3 sessions
    - Writing/Reading: Science Notebook Entry- Answer the focus question
- Part 3- New Plants from Cuttings
    - Students select the cuttings that show promise for developing into new plants and plant them in soil.
    - Investigation time: 1session
    - Assessment: 1 session
    - Writing/Reading: Science Notebook Entry: Answer the focus question.

Investigation 3

- Part 1 Setting Up Terrariums
    - Students build a terrarium with soil and the seeds and plant cuttings from Investigations 1 and 2. They construct a map showing the location of the seeds and plants. Students review what

plants need to live, and read about what animals need.
    - Investigation time: 1 session
    - Reading time: 1 session
    - Writing/Reading: Science notebook entry- Terrarium Map
    - Science Resources Book- "What Do Animals Need?"

- Part 2 Animals in the Terrarium
    - Students can care for the terrarium and record changes they observe over time. They add food, water, shelter, and small animals such as isopods and snails collected from the schoolyard. Students review the concept of habitat, and read about different habitats around the world.
    - Investigation time: 2-3 sessions
    - Reading time: 1 session
    - Writing/Reading: Science notebook entry- Terrarium Map and "Plants and Animals around the World" Review Questions
    - Science Resources Book-"Plants and Animals around the World"
- Part 3 Habitat Match
    - Students match plant and animal cards to various habitats. They learn that plants and animals have structures and behaviors that help them live in their habitat. They review the needs of living things and see how habitats provide for these needs. Students view a video that shows the differences between desert and rain forest habitats.
    - Investigation time: 3 sessions
    - Writing/Reading: Science notebook entry- Answer the focus question.
    - Video: How Plants Live in Different Places https://www.fossweb.com/video?videoID=D2882455
    - Online Activity: "Sorting Animals by Structures"
- Part 4 Squirrel Behavior
    - Students engage in a simulation activity to investigate the food storage strategies of two kinds of animals- red squirrels and gray squirrels
    - Investigation time: 1 session
    - Reading: 1 session
    - Assessment: 1 session
    - Writing/Reading: Science notebook entry- Answer the focus question
    - Science Resources Book: "Learning from Nature"
    - Video: Animal Growth https://www.fossweb.com/video?videoID=G3723103

Investigation 4

- Part 1 Planting Bulbs
    - Students observe garlic or onion bulbs and plant them in a cup with a bit of cotton to hold them in place. They observe the emergence of the roots and the shoot.
    - Investigation time: 3 sessions
    - Writing/Reading: Science Notebook Entry- Growing Bulbs
- Part 2 Planting Roots
    - Students investigate plants with edible roots- carrots and radishes. After observing the parts- leaves, stems and roots- students cut the plants into three or four parts and plant them in vermiculite to see if they will produce new plants. After observing the changes for 2-3 weeks, students draw conclusions about the likelihood of producing new plants from parts that are usually found underground.
    - Investigation time: 2 sessions
    - Writing/Reading: Science Notebook Entry- Cutting Roots

    - Online Activity: "Watch It Grow!" https://www.fossweb.com/delegate/ssi-wdf-ucm-webContent/Contribution%20Folders/FOSS/multimedia_2E/NewPlants_MM_2E/activities/watchitgrow_html5/watchitgrow.html
- Part 3 Plant and Animal Growth
    - Students adopt schoolyard plants to observe throughout the school year. They document their observations in their notebook and discuss the living and nonliving things in the plants' habitat. Students read and observe media about animals and their young. They discuss the patterns of behavior of parents and young that help the young to survive.
    - Investigation time: 2 sessions
    - Reading time: 1 session
    - Assessment: 1 session
    - Writing/Reading: Science Notebook Entry- Answer the focus question.
    - Science Resources Book- "Animals and Their Young"
    - Video: Animal Offspring and Caring for Animals https://www.fossweb.com/video?videoID=G3723107
    - Online Activity: "Find the Parent" https://www.fossweb.com/delegate/ssi-wdf-ucm-webContent/Contribution%20Folders/FOSS/multimedia_2E/Animals_MM_2E/activities/findtheparent_html5/findtheparent.html

Activities to Differentiate Instruction

Differentiation for special education:

- General modifications may include:
    - Modifications & accommodations as listed in the student's IEP
    - Assign a peer to help keep student on task
    - Modified or reduced assignments
    - Reduce length of assignment for different mode of delivery
    - Increase one-to-one time
    - Working contract between you and student at risk
    - Prioritize tasks
    - Think in concrete terms and provide hands-on-tasks
    - Position student near helping peer or have quick access to teacher
    - Anticipate where needs will be
    - Break tests down in smaller increments
- Content specific modifications may include:
    - Provide equipment photo cards for each object with the object name
    - Add words to the word wall as needed
    - Scaffolding thinking through graphic organizers
    - Design individual projects or small-group investigations
    - Utilize online activities such as tutorials and virtual investigations

Differentiation for ELL's:

- General modifications may include:
- Strategy groups
- Teacher conferences
- Graphic organizers
- Modification plan
- Collaboration with ELL Teacher
- Model and encourage the use of new vocabulary
- Display the equipment photo card for each object and write the object's name on the word wall.
- Provide sentence frames and cloze passages for students who need them
- To activate prior knowledge, show or project an image of various grains
- Work with native English speaking peer
- Use diagrams with labels to describe plants and animal parts
- Use Spanish provided resources if applicable

- **Content specific vocabulary for ELL students may include:** Alfalfa, Blade, Fertilizer, Function, Grain, Lawn, Leaf, Light, Mow, Nutrient, Observe, Plant, Root, Ryegrass, Seed, Soil, Sprout, Stem, Structure, Variation, Wheat, Bud, Cutting, Eye, Node, Potato, Tuber, Behavior, Desert, Forest, Grassland, Habitat, Map, Map key, Ocean, Pond, Predator, Rain forest, Shelter, Survive, System, Terrarium, Tundra, Bulb, Carrot, Garlic, Offspring, Onion, Parent, Radish, Vermiculite

Differentiation to extend learning for gifted students may include:

- Provide students with Oat seeds as another type of grain to plant in a straw.
- Allow students to plan and conduct a simple investigation- growing alfalfa and grass in a dark environment and comparing the plants in the two conditions.
- Try growing plants without water
- Investigate the animals in the terrarium- observe then draw. label, and write

Integrated/Cross-Disciplinary Instruction

Language Extensions

- Write a how- to guide for growing plants
- Write about life in the terrarium
- Make a terrarium poster
- Illustrate homonyms (light, ear, foot, conduct, pool)

Math extensions

- Provide students with two math extension problems (found in teacher's manual pg. 122-123, pg. 156, pg. 212-213,and pg. 251-252)

MA.1.OA.A	Represent and solve problems involving addition and subtraction.
MA.1.MD.C	Represent and interpret data.
LA.W.1.2	Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.
LA.L.1.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 1 reading and content, choosing flexibly from an array of strategies.

Resources

- FOSSWEB.com
- URL: https://www.fossweb.com/web/foss-fossweb/additional-resources-xslt?dDocName=D2944460#non-fiction-books
    - Description: This site will lead you to the additional resources for non-fiction books to share with your students.
- URL: https://www.fossweb.com/foss-content?htmlContentID=G3898594
    - Description: This site will lead you to the interactive whiteboard resources for your classroom.
- URL: www.biokids.umich.edu
    - Description: This site includes information for both students and teachers concerning diverse species, especially in southeast Michigan. Check out the Critter Catalog for photos and information about a variety of organisms studied in FOSS modules and courses, including crayfish and cockroaches.
- URL: mbgnet.mobot.org
    - Description: Play games, watch video clips, view animated diagrams, and sing songs to learn about plant parts, photosynthesis, pollination, seed dispersal, and plant adaptations. From the Missouri Botanical Garden.
- URL: www.calflora.org
    - Description: Search plants found in California. Nonnatives are included here, too.
- URL: www.californiacarnivores.com
    - Description: Everything you ever wanted to know about carnivorous plants.
- URL: www.enature.com
    - Description: This site features complete field guides to animals and plants. The regional search feature allows you to find species in your region.
- URL: aggie-horticulture.tamu.edu
    - Description: Getting a pineapple top to take root is no mystery once you follow these instructions.
- URL: www.kidsgardening.com
    - Description: The National Gardening Association provides parents and educators with ideas, resources, and information. Check here for grants for school garden projects. Primary students may need some adult assistance with this site.
- URL: aggie-horticulture.tamu.edu
    - Description: This site includes information and resources for growing and maintaining school gardens plus information about botanic and community gardens.
- URL: www.kidsgardening.org
    - Description: Information about home gardening.
- URL: edis.ifas.ufl.edu
    - Description: This University of Florida site describe how to use seeds to start a garden.
- URL: www.urbanext.uiuc.edu

- Description: Help Detective Leplant and his partners unlock the amazing mysteries of plant life. Sponsored by the University of Illinois Extension Program. Includes a Spanish version. Young students may need help with reading the text.

- URL: www.tryscience.org
  - Description: Find out about more than 400 science and technology centers and museums worldwide. Use an interactive map of the world to find and explore a science and technology center or museum near you. You can also find online adventures and field trips, ideas for experiments at home, plus live webcams. TryScience.org is your gateway to experience the excitement of contemporary science and technology through on and offline interactivity with science and technology centers worldwide. TryScience is brought to you through a partnership between IBM Corporation, the New York Hall of Science (NYHOS), the Association of Science-Technology Centers (ASTC), and science centers worldwide.

21st Century Skills

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.