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Life Science Curriculum Map

The experiments in this module fall under eight topics that relate to two aspects of life science: **Habitats and Communities; and Plant Growth & 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.

Introduction:

- At a Glance – List of Skills
- Introduction
- Table of Contents
- Teacher Assessment Rubric
- Student Self-Assessment Rubric

Lesson Topics:

Lesson One: What is a Habitat?

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

Lesson Two: Habitat Investigation

- Students will learn about different types of habitats, and choose one to study.

Lesson Three: A Habitat Creation

- Students will learn about how wood lice depend on their habitat to meet their needs, and how to create a living habitat.

Lesson Four: Food Chains and Webs –Part One

- Students will learn about and build food chains and food webs consisting of different living things.

Lesson Five: Food Chains and Webs – Part Two

- Students will learn about the role of living things as producers, consumers, or decomposers; investigate the benefit of earthworms in making nutrient rich soil.

Lesson Six: Balance in the Natural World

- Students will learn about the biomes of the world and study an ecosystem existing within one.

Lesson Seven: The Human Factor

- Students will learn about the usefulness of plants and animals to humans; consider the positive and negative impacts of human interactions on natural habitats.

Lesson Eight: Plant Parts

- Students will learn about how the main parts of a plant work to help it survive.

Lesson Nine: What Do Plants Need?

- Students will learn about the basic needs of plants in order to grow healthy, and the importance of plants to people and to all living things in the natural environment.

WHAT DO PLANTS NEED?

LEARNING INTENTION:

Students will learn about the basic needs of plants in order to grow healthy, and the importance of plants to people and to all living things in the natural environment.

SUCCESS CRITERIA:

- make and record predictions about the needs of a plant
- conduct experiments to investigate the needs of a plant
- make and record observations using diagrams and written descriptions
- make conclusions and connections about the needs of plants using written descriptions
- design, plan, and construct a growing environment for plants
- make and record observations of the final product by comparing and sharing similarities, differences, and benefits of the design

MATERIALS NEEDED:

*Send a note home to parents explaining that their children are going to be building an item made from cleaned, recycled materials. A suggestive list of materials to have students bring in are: egg cartons, Styrofoam trays or aluminum plates, plastic bags, boxes, plastic bottles, milk jugs, margarine tubs or other plastic containers.

- a copy of “Do Plants Need Light?” worksheet 1, 2, and 3 for each student
- a copy of “Do Water and Air Play a Part?” worksheet 4, 5, and 6 for each student
- a copy of “The Space Between” worksheet 7, 8, and 9 for each student
- a copy of “A Growing Environment” worksheet 10 and 11 for each student

- two small plants in planter containers, one labeled “light” and the other labeled “dark”
- 4 small potted plants for each group of students
- medium sized boxes (one for each group of students)
- 8 small plants, 2 planter boxes, one labeled “space” and the other labeled “no space”
- planting soil, small garden shovels, newspaper to cover desks
- access to water, a few measuring cups, a couple of watering cans
- assorted potting plants for growing environment experiment (about two for each student)
- rulers, labels, sheets of poster paper, grid paper
- scissors, glue, string, aluminum foil, duct tape, straws, skewers
- chart paper, markers, pencils, pencil crayons

PROCEDURE:

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

1. As a large group, conduct the experiment on worksheet 1. Give students worksheets 2 and 3. They will make a prediction about what may happen to a plant that is placed in direct sunlight and to a plant that is placed in a dark place. Over the next three weeks, students will make observations about the growth of both plants and record them. Then, they will make a conclusion based on their observations. (Sunlight is needed to make plants grow. Plants need the light and the heat from the sun. Sunlight also warms up the soil and rainwater.)

2. Give students worksheets 4, 5, and 6. This experiment can be done as a large group, or in small groups. Students will make a prediction about what may happen to a plant that is placed in a dark place with no water or air, to one that is in a dark place with air and water, to one that is in sunlight but given no water, and to one that is in sunlight, in open air, and given water. Over the next two weeks, students will make observations and conclusions about the growth of the plants and record them on worksheets 5 and 6. Observation prompts: What color are the leaves? Does the plant look healthy or sick? (Sunlight, water, and air are needed to make plants grow healthy.)

3. As a large group, conduct the experiment on worksheet 7. Give students worksheets 8 and 9. Over the next four weeks, students will make observations about the effect of adequate space on the growth of the plants. Then, they will make a conclusion based on their observations. (Space is needed by plants in order to grow healthy.)

***Upon completion of all experiments, students should understand that plants need sunlight, warmth, water, air, and space to grow healthy.)**

4. Engage students in a discussion about the importance of plants to people and other living things.

- What do plants provide for us? (consider different points of view, for example, farmers, vegetarians, gardeners, scientists, wildlife, etc.)
- What are the threats to plant life? (consider such things as environmental conditions, animals, and human activities)
- What are some ways that *you* could reduce the harmful effects on plants and help them to survive?

5. Explain to students that they will design, plan, and construct an environment that helps plants to survive grow healthy. Give them worksheets 10 and 11, and the recyclable and other assorted materials to construct. Upon completion of its construction, encourage students to compare their final product with a partner's final product. They will also need to make observations about its ability to meet plants' needs.

***As an activity to enhance the learning about the physical characteristics and needs of plants, show students The Magic School Bus episode called "Goes to Seed". Episodes can be accessed at www.youtube.com**

DIFFERENTIATION:

Slower learners may benefit by:

- working as a small group with teacher support to conduct the experiment on worksheets 4, 5, and 6 (if this experiment is not being completed as a large group activity)
- discussing their findings after each experiment within a small group with teacher support to consolidate their learning
- working with a partner to plan and design a growing environment for plants, the construction could be completed as a team or independently

For enrichment, faster learners could:

- create a 'Gardening Tips' poster that defines the needs of a plant in order to grow healthy, or alternatively, create a poster that outlines the importance of caring for plants in our environment
- use grid paper to design a floor plan of a greenhouse, calculate its perimeter and area



Do Plants Need Light?

Do plants really need sunlight to grow? Let's conduct an experiment to test if sunlight affects the growth of plants!

Question: Can a plant live and grow without sunlight?

Materials Needed:

- 2 small potted plants (one labeled “**LIGHT**” and the other labeled “**DARK**”)
- water
- a measuring cup
- a ruler
- sunlight

What To Do:

1. Make a prediction about the answer to the question. Record it on worksheet 2.
2. Place the “**LIGHT**” plant in a sunny place, and place the “**DARK**” plant in a dark place.
3. Every 3 or 4 days, water the plants. Be sure to give them the same amount of water.
4. Every Monday, measure the height of each plant.
5. Using worksheet 2, record your observations of both plants every Monday, for 3 weeks.
6. Make a conclusion about what you observed.

Let's Predict

Can a plant live and grow without sunlight?

Let's Investigate

This is what I saw each week.

WEEK 1

	Light Plant	Dark Plant
How tall is the plant?		
Does the plant look healthy or sick?		

WEEK 2

	Light Plant	Dark Plant
How tall is the plant?		
Does the plant look healthy or sick?		

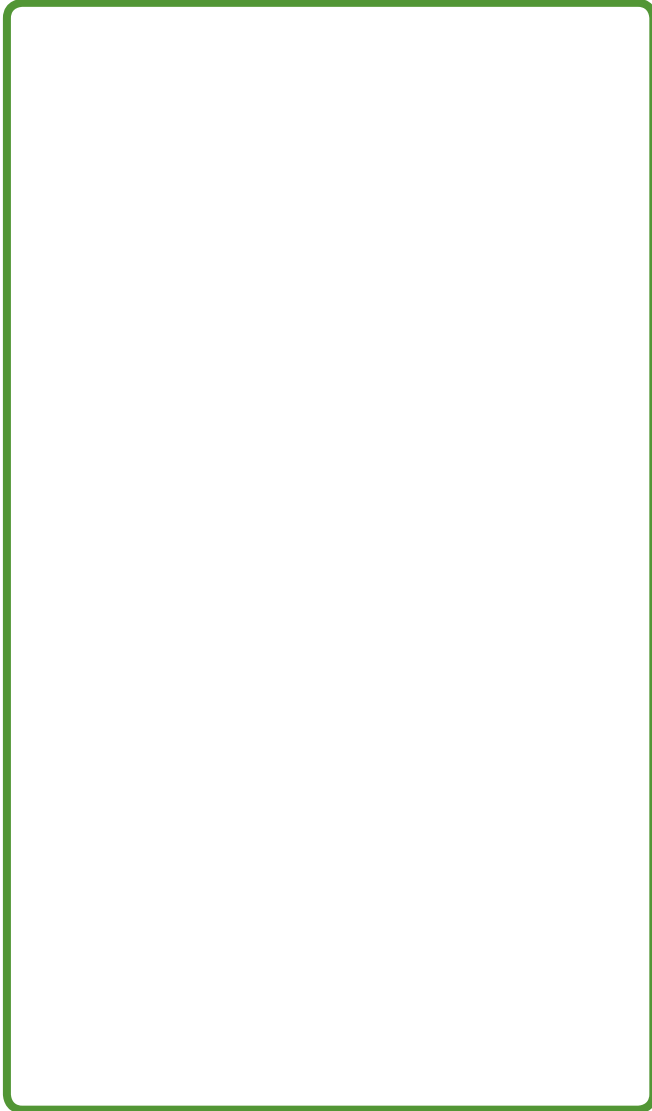
WEEK 3

	Light Plant	Dark Plant
How tall is the plant?		
Does the plant look healthy or sick?		

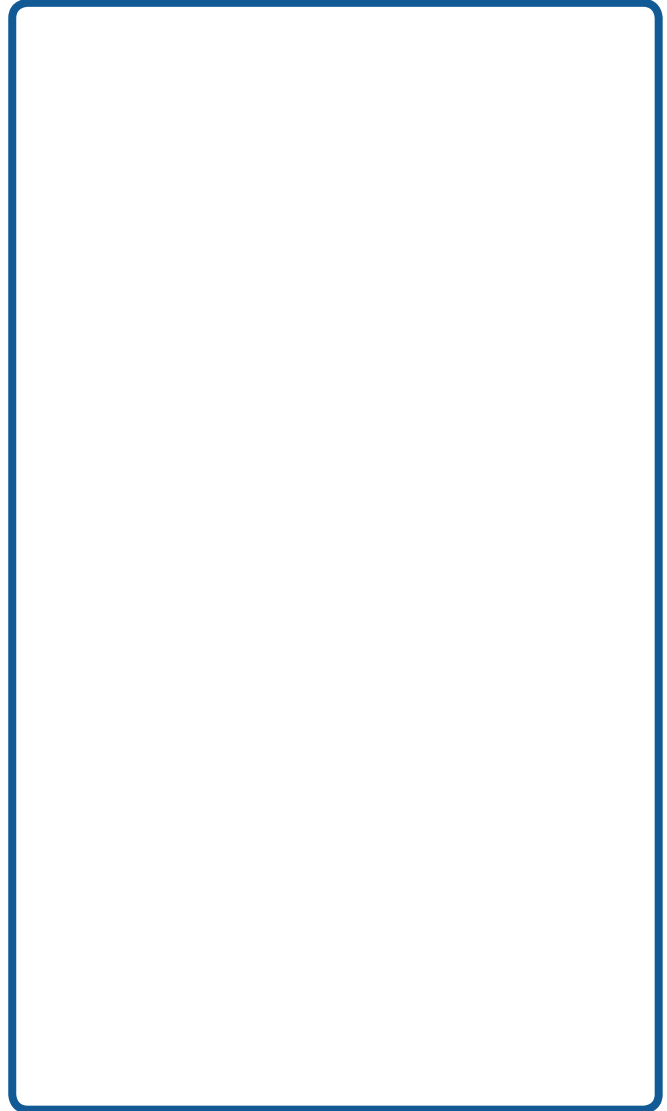


Draw and label a picture to show what happens when a plant is grown in:

sunlight



a dark place



Let's Conclude

Do plants need sunlight to live and grow? Explain.

Do Water and Air Play a Part?

Question: Do water and air affect the growth of a plant?

Materials Needed:

- 4 small potted plants (one labeled “**DARK, AIR, and WATER**”, one labeled “**DARK, NO AIR, NO WATER**”, one labeled “**LIGHT and AIR**”, and one labeled “**LIGHT, AIR, and WATER**”)
- water
- watering can
- measuring cup
- a medium sized box
- a plastic bag

What To Do:

1. Make a prediction about the answer to the question. Record it on worksheet 8.
2. Place the “**DARK, AIR, and WATER**” plant in a place without light.
3. Place the “**DARK, NO AIR, NO WATER**” plant in a plastic bag and place it under the box.
4. Place the “**LIGHT and AIR**” and the “**LIGHT, AIR, and WATER**” plants in a sunny place.
5. Every 3 days, water the “**DARK, AIR, and WATER**” plant, and water the “**LIGHT, AIR, and WATER**” plant. Give them the same amount of water.
6. Record your observations of all plants at the end of each week, for 2 weeks.
7. Make conclusions about what you observed.



Let's Predict

Do water and air affect the growth of a plant?

Let's Investigate

Describe what each plant looked like at the end of each week.

WEEK 1

DARK, AIR, and WATER	DARK, NO AIR, NO WATER	LIGHT and AIR	LIGHT, AIR, and WATER

WEEK 2

DARK, AIR, and WATER	DARK, NO AIR, NO WATER	LIGHT and AIR	LIGHT, AIR, and WATER

**Drawing of the watered
plant grown in the dark:**

**Drawing of the plant grown
in the dark, with no air or
water:**

**Drawing of the plant
grown in sunlight,
without water:**

**Drawing of the watered
plant grown in open air
and sunlight:**

Let's Conclude

What do plants need to live and grow healthy and strong?

How do you know this?



The Space Between

We all enjoy the freedom to move and the space to stretch out. Plants are not much different than us humans. Let's conduct an investigation to see just how much, plants like their own space!

Materials Needed:

- 8 small plants
- 2 planter boxes or large containers
- planting soil
- a small garden shovel
- water
- watering can
- measuring cup
- a ruler

What To Do:

1. Place some soil in the planter boxes.
2. Plant 4 of the plants in the first box, very close together.
3. Plant the other 4 plants in the second box with lots of space between them.
4. Place both planter boxes in a sunny place.
5. Every 3 days, water the plants. Be sure to give them the same amount of water.
6. Record your observations of the plants in both planter boxes at the end of each week, for 4 weeks.
7. Make conclusions about what you observed.

Let's Investigate

Describe what the plants looked like at the end of each week.

WEEK 1

Plants with no space between them	Plants with space between them

WEEK 2

Plants with no space between them	Plants with space between them



Describe what the plants looked like at the end of each week.

WEEK 3

Plants with no space between them	Plants with space between them

WEEK 4

Plants with no space between them	Plants with space between them

To conclude, do plants need space to grow and be healthy?

A Growing Environment

Plants are important to us. Use what you know about plants to design and construct a healthy growing environment that meets all of their needs.

This is a design of my plant growing environment:

This is a list of the materials I will use to build it:

- _____
- _____
- _____
- _____
- _____
- _____
- _____



This is my plan for building the plant growing environment:

1. _____

2. _____

3. _____

4. _____

5. _____

Now gather the materials to carry out your plan. Begin construction!

Let's Test It!

6. Plant some plants in your growing environment.
Monitor them for a couple of weeks to ensure that
their needs are being met.

7. Describe how your plants are doing:
