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POST-TRIP LESSON: GIVE ME SOME SPACE!

Overview: Students explore the needs of plants, including space, by investigating seed packets and planning, drawing, and measuring a garden bed.

Sauvie Island Center Field Trip Connections: Seed to Harvest, Plant Parts, Soil

Objectives

Students will be able to:
- Identify that healthy plants need sun, soil, water, and air, as well as the right amount of space
- Read a seed packet and determine a seed's growth needs for space, climate, and time
- Convert simple measurement from inches to anatomical units of measurement
- Correctly measure and space seeds for planting

NGSS Essential Questions:
- How do organisms interact with the living and nonliving environments to obtain matter and energy?
- How do organisms grow and develop?
- How do organisms obtain and use the matter and energy they need to live and grow?

Grades: 2-5

Time: 45 minutes

Location: Classroom

Materials:
- Vegetable seeds in seed packets- enough for each group to have one packet. They can be of different
   types of seeds, but should all be from the same company for ease of instruction
- Printed "Seed Packet Facts" worksheets for each student
- Writing utensils
- Markers or crayons
- Construction paper
- Rulers
- Tape or glue
- Example of garden drawing with seeds attached

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POST-TRIP LESSON: GIVE ME SOME SPACE CONT.

Lesson Outline:

1.Tell students that in this activity, they will learn to read seed packets to make sure they have the right amount of everything they need to grow, and they will "plant" an imaginary garden.

2. From the field trip, review the four things that all plants need to grow: Sun, soil, water, and air. Ask students if there is anything else that plants need?

    - Role play the space needs of plants. Invite several students to the front of the room to stand in a very tight clump. Would these plants grow very well? Ask the students- do they have room to stretch and grow? Look up- are they getting enough sunlight? Have students move apart- does that feel better?

    - What happens if plants are planted too far apart? There will be more space for weeds to grow and compete with the plants, and rain will more easily wash away the exposed soil

    - Recall the farm field trip. Remember seeing all the plants in evenly-spaced rows? Explain that plants must be planted with enough space between them, but not too much, or they will not grow healthy and strong. Just like humans, plants need the right amount of space.

3. Divide students into groups. Give each group a seed packet. Ask the class, what sort information do you see listed on your seed packets? Pass out the "Seed Packet Facts" worksheet, and Instruct each student to fill out the worksheet with the information for their seeds.

4. Showing your example, instruct students to draw their imaginary garden bed on their horizontally-oriented construction paper, with the line of the soil surface going horizontally across the middle (like a cross-section of the garden).

    - Above the soil, draw the conditions the plant will need, including how much sunlight it should get. Can you think of other ways to show the weather and season?

5. It's almost time to plant the garden. Explain that most gardeners do not take a ruler with them into the garden to determine seed spacing. Instead, they know how to measure using body parts like the width of their thumb or hand. Using their rulers, instruct students to measure different parts of their hand to find something about 1 inch wide (often the width of a thumb for adults, or the width of the pointer and middle finger together in children). Can you find other measurements, like 1 foot?

6. Instruct students to measure the depth and and spacing of their seeds using their body measurements, and then tape or glue the seeds on to the imaginary garden. How many plants did they have space to plant in their garden?

7. If using different types of seeds, compare and contrast between the different plants

    - Why do some plants need more space than others?
    - Did you notice that small seeds are usually planted closer to the surface and big seeds are planted deeper? Why? The cotyledon, or stored energy, within the seed will power it until it reaches the sun to photosynthesize. Small seeds have small cotyledons, and will run out of food before reaching the sun if they are planted too deep. Large seeds are more likely to be exposed by wind or rain and eaten by animals before they sprout if planted too shallow.

Extension Opportunities:

- Using graph paper, practice mapping and math conversions by creating a scale version of an entire garden bed with planting locations for different seeds.

- Plant seeds in the school garden or in a planter in the classroom and watch them grow. Measure with body parts to give them the right amount of space, or experiment by planting seeds too close or far apart and recording the results.

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Next Generation Science Standard Connections:

Disciplinary Core Ideas:

Life Science 2.A: Interdependent Relationships in Ecosystems *How do organisms interact with the living and nonliving environments to obtain matter and energy?*
 - Plants depend on water and light to grow (2-LS2-1, 5-LS2-1)

Life Science 1.B: Growth and Development of Organisms *How do organisms grow and develop?*
 - Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)

Life Science 1.C: Organization for Matter and Energy Flow in Organisms *How do organisms obtain and use the matter and energy they need to live and grow?*
 - Plants need water and light to live and grow. (K-LS1.1)

Science and Engineering Practices:
 - **Obtaining, Evaluating, and Communicating Information**
 - **Developing and Using Models**

References:
Inspiration for this lesson came from The Growing Classroom lesson "Inch by Inch, Row by Row" (Jaffe and Appel, 2007) and the Eat Think Grow lesson "Read About Seeds" (www.eatthinkgrow.org)