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| **Lesson Title: From Seed to Plant** |  |
| **Grade Level:** First | **Quarter:****Third** |
| **Standards:** **S1L1.** Students will investigate the characteristics and basic needs of plants and animals.* Identify the basic needs of a plant.
* 1. Air
* 2. Water
* 3. Light
* 4. Nutrients

 **c.** Identify the parts of a plant—root, stem, leaf, and flower**MGSE1.MD.2** Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. (Iteration)**MGSE1.NBT.3** Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.**MGSE1.MD.4**Organize, represent and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less in one category than in another.  |
| **Lesson Essential Question:** **EQ: How can I design a container where a seed will grow?****EQ: How can I create a garden center to teach others about caring for a garden?**  | **Vocabulary:**Air, water, light, nutrients, root, stem, leaf, flower |
| **Lesson Materials**Construction paper, craft sticks, paper rolls, pipe cleaners, glue, plastic bottles, milk cartons, cardstock, tape, string/yarn, Unifix cubes, twine, soil, variety of seeds, sample, herbs and vegetables | **Lesson Assessment:** Teacher ObservationGarden GuidePlant container |
| **STEM Challenge Overview:**You and your friends will create a small education center in your store so children can learn the importance of plants. You center must include a book about what plants need to grow, a poster about the parts of a plant and an example of a plants growing in a pot that visitors can observe, measure, and chart results on. |
| **Teacher Background:**Students should know from Kindergarten that plants are living things and be able to list what all living things need: food, shelter, water, and air. Teacher should do a brief lesson about the parts of a plant using some of the plants students will be able to choose from to plant seeds. |
| **INSTRUCTION** |
| 1. **Ask/Engage (Day 1-20 Minutes)**
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| * Begin by playing the Dr. Jean song, <https://www.youtube.com/watch?v=sXrnHff2Kjc>
* During the song have students stand up and dance to the parts of a plant.
* Flower-Hands connected over their heads in a circle
* Stem-Stand up straight
* Leaves-arms move side to side
* Roots-feet move quickly
* After the song have students talk with a partner what they know about plant parts. Show a plant that you may have been growing in your class and ask the students what they have to do to make sure it survives. List their answers on the board.
* Now introduce the challenge:

You and your friends are horticulturalists who own a greenhouse. In a greenhouse, you can grow plants indoors all year long. Your group starts planting seeds in your greenhouses and provides young plants, or seedlings, to local farmers to plant in their fields. You also have a small store where you sell potted plants, books on how to grow things, and other items related to gardening. You have decided that you want to set up a small educational area so children who visit your greenhouse can learn about plants and how they grow. You will be creating books for the center and a indoor container garden that will grow in your education center so visitors can see the parts of the plant and how plants they grow. |
| 1. **Imagine/Brainstorm**
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| * Introduce the constraints of the design plan. Define the criteria for success.

Your container must:* Hold soil and water
* Have drainage holes
* Have a place to catch the water that drains
* Hold enough soil that a seed will grow

Your Garden Guide must: * Have one book that describes why a plant needs air, water, light, and nutrients to grow
* Have a poster that shows parts of a plant labeled

**Taste Test:*** Students have the opportunity to taste test the results of the optional seeds: basil, parsley, lettuce, mustard greens, oregano, arugula, radish
* After the taste test, students will decide which kind of seed they want to plant.
* Ask each student to work independently to come up with 1-2 possible design solutions. Students should draw/label their designs in their journal as well as list the materials they will need.
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| 1. **Plan/Design**
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| * Each student presents their ideas to their team
* Teams collaborate and give feedback to individual.
* Students adjust their plans as needed.
* Students draw final design plan and make a list of needed supplies.
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| 1. **Create / Test**
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| * Students build their design according to their design plan.
* When students complete their model they will then create their “Plant Guide”
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| 1. **Evaluate/Improve –** and repeat Steps 1-5
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| * Students evaluate their design for success. Did it meet the established criteria? Did their final design match their planned design? How would students improve their design?
* Students will present their plants and “Plant Guides” to another group or they present to the whole class.

**Watching it Grow:*** As the seeds germinate, students will use unifix cubes or other non-standard measuring tool to measure the growth of their plant.
* Growth should be charted and then compared with the growth of other plants: “My plant is 3 cubes tall, her plant is 2 cubes tall. 3 >2 so my plant is taller than her plant. My plant is 1 cube taller than her plant.
* Students should continue to journal about what parts of the plant can be seen as the plant grows.

Once seeds are large enough, you may consider transplanting into a larger container or outside weather permitting so the herb/vegetable has space to grow. |

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