Grade Level: Kindergarten

Piagetian Level: Pre-Op/Concrete

Learners at the pre-operational stage of development with emerging concrete operations are suited for this activity.

STEM *Science, Technology, Engineering, & Mathematics*

Learn & Grow Educational Series℠

Many Little Seeds

Instructional Goal: Following instruction, students will demonstrate an understanding that different seeds produce different plants and will be able to sort and categorize different types of seeds using visual cues (picture cards).

Lines of Inquiry:

- *How are seeds different?*
- *How are seeds the same?*
- *How are the plants that grow from seeds different?*
- *How are the plants that grow from seeds the same?*

Materials:

- *Three different types of seeds in bulk (we recommend tomato, green pea, and lima or fava beans).*
- *Seedling starter pellets, disposable cups, & plastic sandwich bags (enough for 3 each for the teacher and every student).*

- *Small cups for sorting seeds at work stations*
- *Digital camera, computer, paper, color printer & ink/toner*
- *Tools & materials for one self-watering bucket container per student (see http://learn-and-grow.org for instructions & materials list).*

Instructions:

1) *Two weeks prior to conducting this lesson with students, start seedlings of each type of plant in seedling starter pellets.*
   a. *Soak seedling starter pellets in water until fully expanded; gently squeeze out excess water.*
   b. *Place 3 tomato seeds in one pellet, 1-2 pea seeds in the second pellet, and 1 lima or fava bean in the third pellet.*
   c. *Place each seeded pellet in its own disposable cup and place a sandwich bag over the top of the cup to create a mini-greenhouse.*
   d. *Place the cups in a warm, well-lit window for two weeks until sprouts are produced.*

2) *For small class sizes, or if using overhead projection devices that can display objects placed on the projection surface, a single demonstration may be all that is necessary. Larger class sizes will need*

Common Core Standards:

- CCSS.ELA-Literacy.W.K.8: With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.
- CCSS.Math.Content.KCC.A.3: Write numbers from 0-20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
- CCSS.Math.Content.K.CC.B.4: Understand the relationship between numbers and quantities; connect counting to cardinality.
- CCSS.Math.Content.K.MD.A.2: Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.
- CCSS.Math.Content.K.MD.B.3: Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

CA State Standards—Science:

- K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.

Many Little Seeds, continued...

to be broken down into small groups each with their own set of materials so they can follow the instruction. For each demonstration and for each group, sort tomato, pea, and bean seeds into cups that are each labeled with their common names in text, a picture of the seeds, and a picture of sprouted seedling(s) from the same seed stock. Use no more than 20 tomato seeds, 15 pea seeds, and 10 lima or fava bean seeds per demo or group station.

3) *Demonstrate to students that the seedlings grown over the prior two weeks came from the different types of seeds. Discuss with students the fact that, while different seeds produce different plants, they all still need water, clean air, soil, and sunlight to grow. Emphasize the things they share in common as well as the things that make them different and engage students in whole group discussion of similarities and differences among the seeds and seedlings.*

4) *At each work station, whether with a small single group or several groups within a large class, turn out the seeds onto each work surface in distinct piles, then, with adult support as needed, have students count out each type of seed in each cup. Have students record the counts for each seed type on their data sheet for this lesson plan. Once counted, swirl the seeds together a bit on the work surface. Have students sort the seeds and put them back into their respective cups.*

5) *Once the cups are sorted again, have the students soak three of their own seedling pellets and start their own seedlings with one pellet each per student of tomato, pea, and bean seeds as described in step 1, above. Have students mark their cups with their names. Once a student's seedlings have grown above the tops of the cups, or are at least 2" tall, transfer them to a self-watering bucket container (see http://learn-and-grow.org for instructions on building self-watering bucket containers), one container per student, each containing the student's three different seedlings types. Adult assistance should be given to thin seedlings down to a single viable plant per pellet.*

6) *Grow the seedlings in the self-watering bucket containers and revisit the concepts of different seeds producing different plants as they grow and eventually produce vegetables (spiral the instruction).*

7) *Use these plants for other lesson plans that focus on plant and soil science, hydrogeology, etc.*

8) *Determine how the produce grown will be used. This should be a student-led decision where possible. Options include, but are not limited to, eating the produce in class, providing the produce to the school cafeteria, sending the produce home with students, or donating the produce to a local food pantry.*

Where possible, children should be encouraged to eat the fruits and vegetables they grow in order to make the cognitive connections between growing food, where food comes from, how food provides fuel to the human body, and how healthy foods make a difference in how the mind and body feel and work. This also gives them a sense of empowerment and control over their environments that encourages their intrinsic motivation to eat healthy foods.

Learn & Grow Educational Series℠

KPS 4 Parents™
Knowledge Powers Solutions for Parents

Grade: Kindergarten Piagetian Level: Pre-Op/Concrete

Many Little Seeds—Student Data Sheet

Name: _____

Date: _____

Write your answers in the boxes.

Note to Teacher: Write in the types of seeds used, one in each blank. We recommend tomato, green pea, and lima or fava bean seeds, but you can use other seeds so long as they look distinctively different from each other and produce seedlings that are visually distinguishable, as well.

How many _____ seeds are there?

How many _____ seeds are there?

How many _____ seeds are there?