

## Part 1

Pose the following STEAM questions on the board for students to consider and think about throughout the lessons that day. Ask questions such as:

1. What four things do seeds need to grow inside or outside?
2. How does fertilizer help a plant grow?
3. Why do you think the light bank needs to be so close to our seedlings?

Invite students to sit as a group to read the book *Seeds* by Grace Hansen. This book covers the life cycle of a seed from seed coat, radicle, germination, plumule, and flower. Throughout the text, pause and show students the images of each stage. Have them analyze the images and come up with something it reminds them of in real life. For example, the seed coat is just like putting on a winter coat. Students would realize the coat protects the seed from cold and harsh conditions just like their jackets do. Question students throughout the book as a formative assessment to gauge for understanding.

## Part 2

Divide students into groups of four. Students will be coming up with a tableau to demonstrate their knowledge on the stages of a seed. A tableau is a group of models or motionless figures representing a scene from a story. Write on the board the following stages: Germination, Radicle, Plumule (seedling), and Flower. Students will need to think outside the box in order to use their bodies to show what the stages look like. Give students 5 minutes to work together to discuss and experiment with what works and what doesn't work. After the 5 minute time limit, call students to sit in a semi-circle around the carpet. Groups will present their tableau one at a time. Have other groups guess what each person represents or what the group is showing. Let each group have a turn and have the other students view the groups representation and discuss what is going on in the frozen model.

**Grade Level:** 2

**Subject Area:** Arts / Literacy / Math / Science

**Materials:**

*Seeds* by Grace Hansen  
 Chart paper  
 Designated seeds  
 Insert and flat  
 Soil  
 Dry erase marker  
 Light bank or grow lights

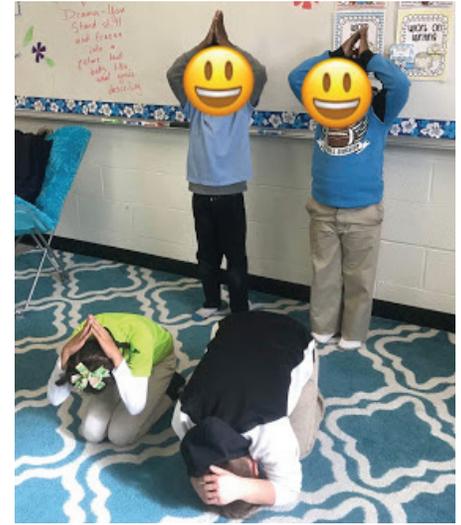
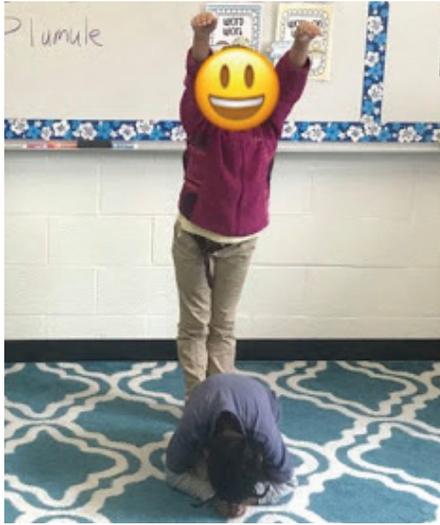
**Standards:**

RI.2.7 Explain how specific images contribute to and clarify a text.  
 L.2.2 Recognize that there is variation among individuals that are related.  
 2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.  
 2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.  
 Theatre 2.CR.1.1.2 Collaborate with peers to conceptualize scenery in a guided drama experience.

**Collaborators:**

Ashlyn Cagle  
 Sharon Ferguson

Examples of student tableau demonstrating seed stages



## Part 3

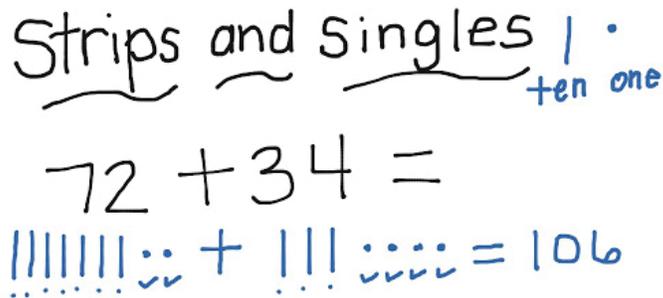
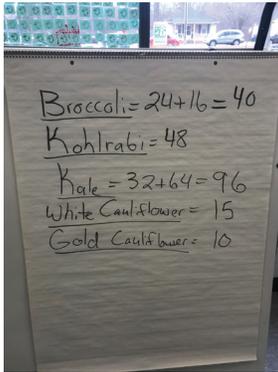
In this lesson students in one class will be creating a plan to grow all the plant starts for the entire school. This can be modified so students create a plan for an individual grade level or class.

Students will help map out how many seeds will need to be grown inside for the entire school. Prior to the lesson ask each grade level to submit the number of each type of crop they would like started. This lesson needs to be completed during the beginning of the planting season when transplants are first being grown. Make a list on the board and divide it into sections (one for each grade level.) Read aloud what each grade level is growing and then discuss what a transplant is and why it is important to start some seeds inside first and why other seeds can be placed directly in the ground.

- Direct seeding or direct sowing means that you plant seeds directly in the garden, rather than buying small plants or starting seeds indoors earlier and transplanting them as seedlings. Many seeds of both flowers and vegetables can be direct-sown.
- Transplanting is the process of moving a fully germinated seedling (or mature plant) from a seed-starting tray to its permanent location for the growing season. Seeds started indoors will be transplanted into the garden. Transplants can also be purchased at garden centers.

Next, have students discuss if they see any plants that are repeated across the grade levels.

For example, 2nd grade may need 24 broccoli for their beds and 4th grade may need 16 broccoli. Discuss with students what they could do to find the sum or total of all the types of plants for the school. Students may answer with, "adding them to find the total." Allow students to write in their notebook using strips and singles to find the total number of plants the school needs to grow indoors.



## Part 4

For this activity you will need potting soil, inserts, flats and the designated seeds that will be grown indoors.

First, pull out one of each seed and either show it to your students in groups or individually. Have them analyze the seeds, observing their similarities and differences. Ask questions such as "Why are the seeds different colors?" "Why are some seeds larger (or smaller) than others?" "If the seed is larger, will it grow into a larger or smaller plant?" Have several students share their answers with the class and guide a brief discussion for each question.

Next, pass out inserts to each student. The students should each have 12 pods (individual cells) for the inserts. Using a dry erase marker, write what type of seed the student will be receiving on their desk or sticky note to keep record of it.

Students will be able to break apart their inserts and arrange them into different groups of 12. (An array lesson will need to be taught before introducing this activity.) Students should know that arrays are a way of organizing a number into a set number of groups using rows and columns. Students should also know that arrays are another form of repeated addition. They can either add their rows multiple times or their columns. Allow students to rearrange their inserts to show different arrays that represent the number 12. Students can either arrange them in a 1x12, 2x6, or 3x4. Some students may create a 3x4 or a 4x3. If so, ask them if this array is the same or different?

Using a dry erase marker on their table, instruct the students to write their array and a repeated addition problem to go with it. For example a 2x6 would be  $2+2+2+2+2+2$  or  $6+6$ . Have them share their results with members of their team.

When a student is done, they may go to the bag of potting soil (with teacher help) and fill their inserts  $\frac{3}{4}$  full with soil. Students will then be given the seed types that were written on their desk to be placed into each pod of the insert.

Demonstrate to students that plants need space to grow and seeds can't be covered with too much soil. Show students, once they have placed a seed in the middle of their pods, to grab a "pinch" of soil from the potting soil bag to cover each seed. Also remind students that they should not pack or press down on the soil. The seeds need space to sprout and grow.

When the entire class is done, have students lightly water their inserts and then place the inserts in a tray under the light bank to grow!

## Your Notes & Ideas