Materials

- Measuring tape, yardsticks, or rulers
- String or yarn
- Painter's tape or masking tape
- Johnny's Seed Catalog
- Seed ordering information sheets for each featured plant

Preparation

- Post plant spacing requirements on the board for lettuce, turnips, and snap peas
- Consult a Johnny's catalog and cut out the seed ordering information for each featured crop. Attach to a separate piece of paper and make copies for each group.

PROCEDURE

Part 1: Design Planting Scheme

- Divide students into groups and assign each a relatively open area of the classroom to work in. Post the dimensions of your school's garden beds on the board. Have students use a tape measurer and painter's tape to replicate real-size garden beds on the floor.

- Assign each group one of the featured crops. Instruct students to consult the information of the board for their plant's spacing requirements. First, have students use rulers to measure spacing between rows. "How many rows can you fit in your garden bed?"

- Have students establish rows using a ruler and string. "Starting at one end of the garden bed, use the ruler to measure the space between rows. At the beginning of each row, attach a piece of string to the garden bed with a piece of tape. Stretch the string the other end of the bed and attach with tape. Repeat for each row that follows."

- Starting with the first row in their garden bed, have students measure and label the spacing between individual plants. As they measure, have students mark each "plant" with a small piece of tape. Repeat the process until all rows have been measured and marked. Have students count the total number of plants they can fit in the bed.

Part 2: Determine Volume of Seed for Planting

- Draw three columns on the board for lettuce, turnips, and snap peas. "How many plants can you fit in a garden bed?" Discuss results for each plant and record students' calculations on the board. "This number represents how many seeds we need to plant in each bed. How many beds of each crop will we be planting?" For each crop, multiply seed needs per bed by number of beds to be planted with the featured crop.

Part 3: Calculate Seed Order

- "We are going to use this information to determine how big of a seed packet we should order." Introduce the seed catalog and explain how seed packets are sold. Then, distribute seed ordering information sheets to each group. "Consult the seed ordering information to determine how many seeds are in a one ounce packet."

- Have students use their results from the previous activity to calculate the seed order for their plant. "Will one packet be enough? Or will we require more? If so, how many additional packets? If a one ounce packet contains more seed than we need, how many seeds will we have left over after planting?" Review basic subtraction if necessary, or do the calculations together as a class. Record final calculations on the board.

Determine Volume of Seed for Planting and Ordering

Objectives

- Students will understand how to use a plant's spacing requirements to design a garden bed planting scheme

- Students will be able to determine the volume of seed to be planted based on their garden bed designs

- Students will be able to calculate the size of the seed order for each featured crop

ENGAGE

Gather together in a dense group in an open area of the room. As students are squished against one other ask, "Are you comfortable?" Then, instruct students to spread themselves throughout the room until their outstretched fingertips are barely touching their neighbor's. The goal is to stay together as a group, but with enough space between students to allow for comfortable movement. "Are you more comfortable now? Imagine you are a plant in garden bed. When plants are squished together, they cannot access the resources they need to survive. Plants need a certain amount of space in between other plants in order to grow big and strong and produce large harvests."

EXPLAIN

Determine Spacing Between Plants and Rows

Establishing proper spacing between plants assures that your garden crops are able to access adequate sunlight, water, and soil nutrients, while eliminating outside competition from weeds. How much space do plants need?

- Lettuce – 10" between plants for head lettuce, 8" between plants for leaf lettuce, 12" between rows
- Turnips – 2" between plants, 12" between rows
- Snap Peas – 4" between plants for bush beans, 18" between rows

Determine Volume of Seed for Planting and Ordering:

In contrast to farmers, who often order large bags of seed for planting over a large area of land, home gardeners purchase seeds in smaller increments. How many seeds are in a small packet?

- Lettuce – One gram of lettuce seed is 600 seeds. When using a row seeder, we plant about 30 seeds per foot (seedlings are thinned a few weeks later). Rows are 5 feet long, with five rows in a 3X6-foot wide bed.
- Turnips - One gram of turnip seed is 400 seeds.
- Snap Peas - One ounce of pea seed is 125 peas.

ADDITIONAL CONTENT INTEGRATION *(see previous page)*

Additional Materials

- Your school's standard garden bed template drawn onto a piece of letter paper (make one copy per group)
- *Optional:* digital camera

Part 1: When students have completed their planting schemes, pass out garden bed planting templates. Have each group member copy the finished planting scheme onto the template. *Optional:* Use a digital camera to take a picture of each finished design.

Part 2: "Should we plant additional seeds for backup? How many?" Record responses on the board. Combine figures to determine each plant's seed needs per bed (actual needs + additional seeds backup).

EVALUATE

Journal prompt: Based on your calculations, how many packets of seed should we order for your featured crop? Will there be any seeds left over after planting? If so, how many seeds will we have left over for next year?