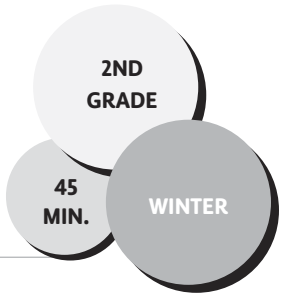
Seed Tape

THEME: GROWING AND ACCESSING HEALTHY FOOD



ESSENTIAL QUESTION

How do we plan our planting for success?

LEARNING OBJECTIVE

✓Students will be able to measure and evenly space seeds.

CONCEPTS

decomposition inches
spacing thinning plants

Engaging the Classroom Teacher

- Prior to the lesson, discuss with the teacher what measurement and other math standards students are working on, for example, whether they can skip-count by 2s.
- Show the teacher the lesson, and ask whether they would like to add any further math connections during Action Step 4.
- Establish a place in the classroom where the seed tape can dry, explaining when you'll collect them (they'll dry quickly, so you can collect them by end of day).
- Set a follow-up date with the teacher in the spring when you can lead students in planting their seed tape outside. Otherwise, coordinate with the teacher to send students home with seed tape.
- During Action Step 5, suggest that the teacher help students make their seed tape.

LESSON DESCRIPTION

In this lesson, students consider the importance of spacing seeds by pretending to be crowded seeds and measuring and creating seed tape. This lesson can be taught in conjunction with lessons Saving Seeds and How Seeds Travel.

MATERIALS

- ☐ Biodegradable paper, such as brown paper towel, toilet paper, tissue paper, or newspaper
- ☐ Paper cutter or scissors
- ☐ Packet of radish seeds
- ☐ Packet of carrot seeds
- ☐ 2 clear jars with lids
- ☐ 2 cups all-purpose flour
- ☐ 2 cups water
- ☐ Newspaper or vinyl tablecloths to cover tables
- ☐ Seed Tape Steps Poster (p.265)

For each group of 4–6 students:

- ☐ Small dish or jar of paste
- ☐ Dish of radish seeds
- ☐ Dish of carrot seeds
- ☐ Paintbrushes, toothpicks, cotton swabs, or straws
- ☐ Rulers
- ☐ Pencils

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PREPARATION

- Cover tables with newspaper or vinyl tablecloths.
- Create a paste by combining equal parts water and flour (2 cups water to 2 cups flour should be sufficient for a class of 30). You should then have a thick paste. You'll want to add a little more water if the paste begins to dry out.
- Cut your brown paper towels (or other material) into strips 1.5–2 inches wide and 12 inches long. (Or determine the length based on how much seed you have.)
- Create a sample seed tape to test paste and have a model for students.
- Pour a few radish seeds into one clear jar with a lid and a few carrot seeds into the other. Distribute the rest of the seeds into dishes for each group.
- Check with the classroom teacher, and establish a place for seed tapes to dry once students are finished.
- Photocopy the Seed Tape Steps Poster for each table group, if using.

ACTION STEPS

1. Role-Playing Seed Spacing: Gather students in a circle. Say, *Now take two scoots in closer to the circle so we're all really close together.* Then ask students to lift their arms and stretch out carefully. Ask, *Are you able to stretch as much as you'd like? Why not?* Say, *Plants are just like us. They can't grow as big and healthy and happy as they'd like to if they don't have enough space apart from their neighbors (including plants we didn't plant, which is why we weed!).* Explain that gardeners often "thin" plants after they've sprouted to make room for them to grow. Have a student walk around the circle, tapping every other student on the shoulder and having that student step out of the circle, as if they've been thinned. Say, *Sometimes we eat plants that we've thinned, but other times they just end up in the compost pile.* Ask students for an alternative solution to thinning. Get to the idea of spacing the seeds farther apart. Have the thinned plants return to the group, and now ask everyone to take three scoots back and try to stretch and grow, pretending they're a plant again. Ask, *Does that feel better?* ***(5 min.)***

2. Explain the Activity: Show students your seed tape sample and say, *Today we're going to make seed tape, which gardeners sometimes use to make it easier to give their seeds space right from the start. We'll measure how far apart our seeds should be, and we'll paste the seeds onto our paper. In the spring, when it's time to plant outdoors, we'll put our seed tape in the ground, for perfectly spaced root vegetables!* Pass jars of radish and carrot seeds around the circle, and have students turn and talk to a neighbor once they've seen the seeds, making observations, comparing and contrasting them. Then say, *But wait a minute, can we really plant paper in the ground? What will happen to it?* Take a couple of responses from students, discussing how paper is made from trees that were once alive, so they will break down or decompose with the help of the living things in the soil. ***(5 min.)***

3. Model: Have students return to their desks. Using the board and some magnets or a document camera, demonstrate how to use a ruler to mark their strip of paper

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with a pencil every two inches in the middle of the width of the strip. Next show them how to put a dot of paste on each mark, and add one or two carrot seeds on each spot. Explain that it's sometimes okay to put two seeds because not every seed sprouts every time, but if we put more than that, it defeats the idea of making our seed tape. Then show them how to fold the paper in half over the seed. Say, *It's like we're putting our seeds to bed until it's time for them to wake up in the ground in the spring!* ***(5 min.)***

4. Measuring: Pass out a paper strip, as well as rulers and pencils, to each student. Let students decide whether to make radish or carrot seed tape, or assign pairs or tables to make a certain kind. Have students make a mark every inch for the radish and every two inches for the carrots. Incorporate some math. Ask students, *How many carrot seeds will fit onto our strip if they're spaced two inches apart? How many radish seeds fit on the same length? So how many more radish seeds than carrot seeds are we able to plant in the same space?* ***(10 min.)***

5. Making Seed Tape: Have groups of students share dishes of paste and dishes of seeds. Remind students to share and only take what they need. Circulate through the room, checking in with students and providing guidance where needed. Remind students to fold the paper over and gently press to secure it and put their seeds to bed. Have students write their names on their seed tape, and show them where to put them to dry. If you intend to plant in the school garden in the spring with these students, let the seed tape dry, and store it in a sealed container. Otherwise, you may want to send students home with their seed tape. If you covered your tables with newspaper, and you have a worm bin, gather and shred the paper to add to your worm bin during cleanup. ***(15 min.)***

REFLECTION

Have students discuss the following questions in small groups, then share with the class: ***(5 min.)***

Social and emotional learning

- *How did it feel when you were all crowded together?*
- *Why is it important to give people their own space?*

Check for understanding

- *Why is it important to pay attention to how we space our seeds?*
- *How will our seed tape help us in the spring?*
- *What worked well while making our seed tape? What was challenging?*
- *What do you think it'd be like to plant those tiny seeds outdoors by hand?*

ADAPTATIONS

Follow-Up: In the spring, have students plant their seed tape in the garden. Have students dig a two-inch deep furrow, lay the seed tape down, and gently cover it with soil and water.

Science Inquiry Extension: If you're able to plant in the spring, have students create a control—a seed tape on which the seeds are too close together. Students then have the opportunity to make predictions and observe the different plantings' growth and health over time.

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Tasting Extension: With extra time, have students taste-test different varieties of carrots or radishes. You can also try tasting radishes with and without salt, which affects the spiciness of the radish.

ACADEMIC CONNECTIONS

Math Common Core State Standards

CCSS.MATH.CONTENT.2.MD.A.1

Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

CCSS.MATH.CONTENT.2.OA.C.3

Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

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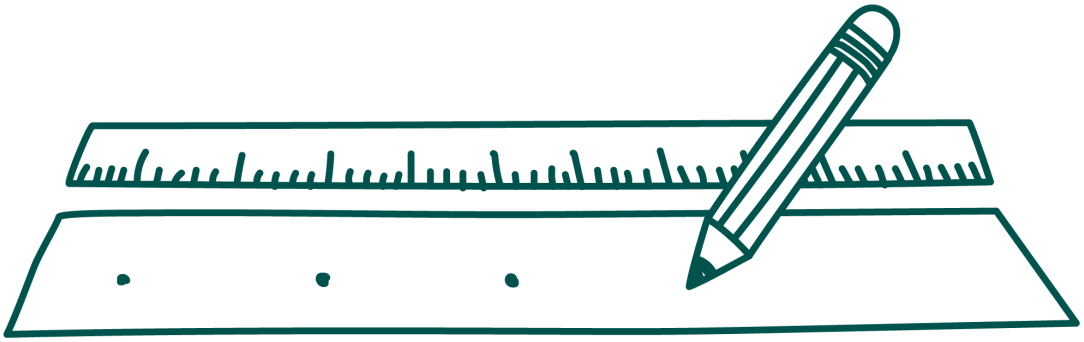
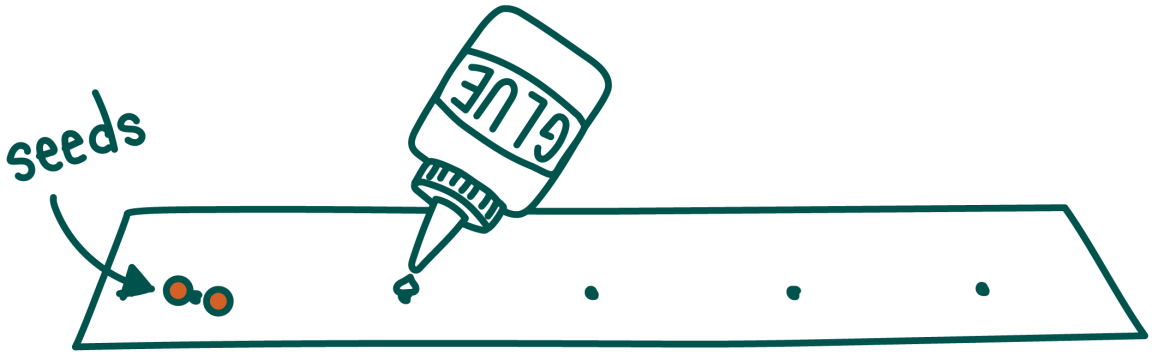
Name: _____ Date: _____

SEED TAPE STEPS

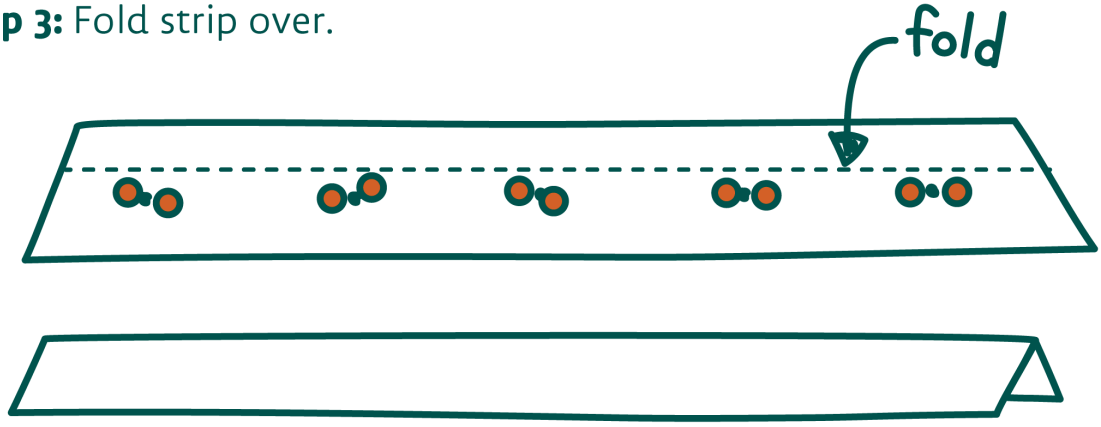
Step 1: Mark a dot every two inches on paper strip.



Step 2: Use glue to paste 1-2 seeds on mark.



Step 3: Fold strip over.



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