

UNIT 5 | CROWDING

CROWDING CAN BE SEEDY

METHOD

A simulation and gardening lab give students hands-on experience with the effects of increasing population density.

MATERIALS

Part 1:

- 20 ft of yarn/tape or chalk

Part 2:

- Package of radish seeds (or other fast germinating seeds)
- Potting soil
- Plastic containers to plant seeds (per student)
- Water-catch basins (plastic lids, aluminum pans, etc.)
- Labels
- Student Worksheet (provided)

INTRODUCTION

Different plants and animals need different amounts of space to grow well and be healthy. In this activity, students will first simulate seeds sprouting together in a crowded pot then plant real seeds in a gardening lab to determine how space makes a difference in their growth.

PART 1: THE SPROUTS GAME

PROCEDURE

1. Mark off a 5 ft x 5 ft (1.5 m x 1.5 m) area with yarn, tape, or chalk.
2. Ask someone to assume the role of a seed. The seed is “planted” inside the square and remains dormant. (Person should be sitting with head tucked.) You can use the following rhyme to signal the seed to start “growing.”



CONCEPT

Crowding affects the ability of living things to thrive.

GRADE LEVEL

Lower elementary

SUBJECTS

Science, Social Studies, Math

OBJECTIVES

Students will be able to:

- Describe two effects of crowding on living things.
- Name two resources plants need to grow well.
- Chronicle observations of growing plants using pictures and words.

SKILLS

Observing, collecting and analyzing data, drawing, basic gardening, understanding cause and effect, employing the Scientific Method



*The sun shines,
the wind blows,
the rain falls and
the little seed grows!*

Given a signal to sprout, the seed slowly becomes active and finally becomes a mature plant, standing and slowly waving its stem and branches (using arms and upper body).

Ask the student: “Do you have enough soil for your roots? Enough space for your leaves? Enough light?”

3. Now plant more and more seeds (students) in the same area and (try to) repeat the growth process each time. Be sure to interview the seeds after each round. Set ground rules about touching other students. (Ex. If you touch another plant, you have become tangled and cannot grow, so you must go back into the ground.)

DISCUSSION QUESTIONS

1. What happened to some of the “seeds?”

As the activity progressed, the seeds became more crowded and had less space to spread their roots and leaves. Each seed had a smaller share of the soil and the rain.

2. How did you feel if you did not have enough room to sprout and grow?
3. Think of your own home and the people you share it with. What would it be like if there were two or three times as many of you living there? What things might there be too much or not enough of? (*Possible answers: too much noise, trash; not enough beds, food, hot water, space, privacy, quiet, etc.*) How do you think you and the people you live with would like that?

PART 2: GARDENING GROWTH

PROCEDURE

1. Make planting pots by punching drainage holes in the bottoms of plastic containers deep enough for growing radishes.
2. Fill the pots with potting soil to about 1/4 inch below the rim.
3. Distribute the seeds as follows: Give 1/3 of the class (Group 1) one seed each; give 1/3 of the class (Group 2) two seeds each; give 1/3 of the class (Group 3) six to ten seeds each.
4. Plant seeds at the depth recommended on the seed package. Each student should plant all his or her seeds in a single hole in the middle of the carton. Students should label their cartons with their names, the number of seeds planted, and the date.

5. Set the pots in a lighted spot and keep them moist. Seeds should germinate in about one week. Maintain the plants during the growth period and have students draw and make notes on the growth observed (including measuring height) for their plants either in a science journal or on the provided Student Worksheet. Place the pots for each group together so that students can compare the foliage among groups. Make sure all of the plants receive the same amount of water and sunlight to eliminate multiple variables from the experiment.



6. Harvest the radishes when foliage appears thick and mature. It should take 20-30 days from the time you plant the radishes to when you harvest them (using spring varieties). Compare the size and relative health of the plants and radishes for the different groups.

DISCUSSION QUESTIONS

1. Which students grew the largest radish? The smallest?
2. Which group overall grew the largest, most healthy-looking radishes? Why do you think that was the case?

Most likely, Group 1 grew the largest radishes. The seeds in this group had the most space, received all of the sunlight, could take in the soil's nutrients, etc.

MEASURING LEARNING

Review students' science journals or worksheets for their observations and drawings of the plants over the course of the month and gauge understanding from classroom discussion.

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STUDENT WORKSHEET

Name: _____

Date: _____

Group: _____

In each block on the chart below, draw a picture of your plant for Days 5, 10, 15, 20, 25, and 30 and measure the height of the plant with a ruler. On Day 30, you can draw the radishes that were pulled up from the roots.



Day 5 Height: _____ centimeters	Day 10 Height: _____ centimeters
Day 15 Height: _____ centimeters	Day 20 Height: _____ centimeters
Day 25 Height: _____ centimeters	Day 30 Height: _____ centimeters

1. How many seeds did you plant in your pot? _____

2. On which day did your plant begin to sprout? _____

3. How many radishes grew in your pot? _____

4. Did your plant and radishes look healthy? _____ How can you tell?

5. How do your plants and radishes compare to the ones grown by others in your group?

6. How do your plants and radishes compare to the ones grown by students in the other two groups? _____

7. Name two resources that your plant needed to be healthy. _____

and _____

8. Name two effects of crowding too many plants in the pot. _____

and _____