



# Salad Life Cycles & Traits

## Next Generation Science Standards

**3-LS3-1** Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

**3-LS3-2** Use evidence to support the explanation that traits can be influenced by the environment.

## Materials

- Access to a garden bed with healthy soil
- Garden notebooks or worksheets and clipboards
- Seeds (or seedlings)
- Pencils
- Garden Signs
- String
- Rulers
- Buckets or hoses for watering
- *Optional for salad* - salad dressing, additional salad toppings like cheese or strawberries, grater for shredding root vegetables, bowls, plates, cutting board, and forks

## Overview

In this lesson, students will create a salad garden with cool weather crops like lettuce, spinach, carrots, and radishes. While maintaining and harvesting in the garden, they will compare life cycles and traits between plants that get different amounts of water. At the end of the experiment, students will create a salad from the garden!

## Objectives

- Students will analyze data from multiple plants of the same variety to determine how plant traits are affected by how much water they receive.
- Students will identify plant needs to plant, maintain, and harvest crops.
- Students will compare and contrast the traits of plants that were grown in the same conditions to determine if one species has the same inherited traits.

## Background

The school garden is the ideal location to see the range of traits between different types of plants and among the same variety. Conveniently, cool weather crops like spinach and kale grow best if planted after school starts so students can observe the entire life cycle, from seed to seed. Cool weather crops grow best if planted from mid-August to early September.

## Activity

### Day 1 - Planting

- Planting seeds in St. Louis typically needs to happen by the second week of September. If you did not plant in time, use seedlings or plants already growing in the garden.
- If a garden bed is not prepared, have students clear out at least one garden bed of summer crops, weeds, and debris. If compost is available, prepare the soil by mixing in a thick layer of compost throughout the garden bed.
- Divide the garden bed(s) in half with string. On both sides of the bed(s) plant an assortment of cool weather crop seeds or seedlings that can be made into a salad.



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## Resources for Vegetables

- Gateway Greening sells seeds for \$0.25/packet on Saturdays, from 9 AM - noon at 3815 Bell Ave. In-network school gardens get 10 free seed packets a season.
- In late August, check with local nurseries for cool weather crop seedlings that they may sell at a discount.
- Use the [Gateway Greening Planting Calendar](#) to figure out when and what to plant.

## Activity

### Day 1 continued

- Suggestions for planting: lettuce (all varieties), spinach, radishes, carrots, and other root vegetables that can be shredded into salads like turnips and beets. Look for varieties that have a quick day to maturity (DTM) and mention being "cool weather crops."
- Follow the seed packet instructions for depth and spacing. Use body parts to indicate to students how deep and far apart to plant seeds - e.g. one knuckle deep and a hand span apart. Try to have seeds planted in a similar arrangement and amount on both sides of the garden bed.
- Label the beds after the seeds are planted. Mark one side of the bed "extra water" and the other "less water." Give both sides a healthy soaking of water.

### Activity 2 - Maintenance

- Once a majority of the seeds have germinated (see seed packet for days to germinate), begin to differentiate the care of the salad beds.
- All of the plants should be weeded and watered weekly but give twice as much water to the Extra Water Side - either soaking it with a hose twice as long or pouring twice as many buckets of water on the plants.
- Thin the plants by cutting the stems at soil level once the plants are 3 inches tall. Most vegetables need to be at least 6 inches apart but look at the seed packet for specifics. Thinned vegetable seedlings are edible and tasty!
- Choose 3 plants on each side, of the same variety, to measure and record growth.
- Measure and make observations weekly.

### Activity 3 - Harvest and Data Analysis

- Have students calculate the harvest date by looking at the Days to Maturity on the seed packets.
- Once most of the plants are mature, pull up root crops and twist off spinach and other greens. (Keep at least 4 leaves on every plant if you want it to continue to grow.)



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## Suggested Reading List

- *From Flower to Fruit* by Richard and Kathleen Konicek-Moran
- *The Oak Inside the Acorn* by Max Lucado
- *How Does a Plant Grow* by Lawrence Lowery
- *It's Our Garden* by George Ancona
- *From Seed to Plant* by Gail Gibbons
- *One Bean* by Ann Rockwell
- *Scientists Ask Questions* by Ginger Garrett

## Day 3 Continued

- Either wash and snack on the produce directly from the garden or have a salad party. Rinse all produce at least two times. Students tear up their own lettuce leaves and an adult shreds the carrots, radishes, and other root vegetables. Add additional toppings and dressing if desired.

## Discussion

### Day 1

- Which plants do you think will get taller? The ones getting extra water or less water? Explain your answer.
- What do the plants need to grow? How should the class help to maintain the plants?

### Activity 2 - Maintenance

- What plant parts grew first?
- Why do you think we have to thin the seedlings?

### Activity 3 - Harvesting

- Where did plants grow taller? The side with extra water or less water? Why do you think that is?
- Did the different types of plants e.g. lettuce and radishes grow the same way? Which varieties have big leaves? Tall stems? How might the different traits help the plants?
- Do all the plants of the same variety look the same? For example, are all the lettuce plants the same height and have the same number of leaves? Why might the plants have different traits even though they are the same type of plant?
- What else could you do to a plant that might affect its growth and what its traits look like?

## Assessment

- Students complete chart of plant growth and compare data from plants that grew in the garden bed with extra water and less water. Students analyze data and create an explanation for why the traits differ.
- Use the "Is it Food for Plants" probe as a pre and post-assessment. Keeley, P. and Tucker, L. (2007) *Uncovering Student Ideas in Science*. NSTA Press, Arlington, VA.



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## Gateway Greening

### Resources

Connect with us on Facebook to discover upcoming Educator Workshops or join the Gateway Greening Educators Group to connect with other teachers:



@GatewayGreening

Discover season-specific gardening how-to's and examples of current lessons:



@gatewaygreening

Looking for Field Trip opportunities or need to ask a question about our education services? Please contact  
education@gatewaygreening.org  
or 314-588-9600 ext 106

### Further Investigations

- Have the students set up the experiment in the spring, but this time they choose how to affect plant growth.
- Do not harvest all of the plants. Let some plants go to seed. The plants will flower then create seeds. Once the seed pods have dried, the seeds can be collected and stored in a cool, dry space. The seeds can be planted next year.
- As plants go to seed, have students identify the different stages of the plant's life cycle. Have each student create a diagram of the plant's life cycle from seed to seedling to flower to seed again.
- Winterize your garden by adding extra mulch or straw around the plants and see how long some of the plants will grow.

### Cross-Curricular Connections

- Cook with your harvest. Observe how the plants change when they are cooked.
- Research the plants the class grew in the garden. Where did the plant come from? What cultures use the plant? How do they eat that plant at home?

Name \_\_\_\_\_

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Record the heights of 3 plants on each side of the garden bed 3 times

**More Water**

**Less Water**

Date	Plant 1 type:	Plant 2 type:	Plant 3 type:
	.....	.....	.....
	.....	.....	.....
	.....	.....	.....