

### Ohio Science Concept

- 4<sup>th</sup> Grade: Earth's living history- Environmental change
- 5<sup>th</sup> Grade: Interactions with Ecosystems
- 6<sup>th</sup> Grade: Cellular to multicellular: Modern Cell Theory

### Next Generation Science Standard

- 4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior and reproduction
- 3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- MS-LS2-2: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

### Science Inquiry and Application

- Use appropriate mathematics, tools and techniques to gather data and information
- Develop descriptions, models, explanations and predictions
- Communicate scientific procedures and explanations

### Objectives

Students will...

- Investigate the structure of a flower
- Interact with a model of the plant life cycle and apply this knowledge to determine proper planting times.
- Use a key to identify plants in the garden and remove unwanted plants.

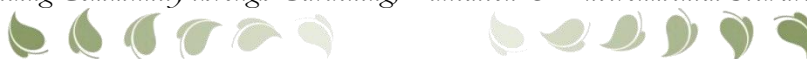
### Materials

- Transition signal (bell, chime, etc.)
- Introduction: Life Cycle Poster
- *Observe Station*: Flowers, tape/glue, "Exploring Flowers" worksheets, magnifying glasses, scissors
- *Explore Station*: Plant life cycle poster, plant hardiness zone maps, seed packets, "What Can I Plant"?
- *Garden Station*: ID guide of spring plants as two week and four week sprouts, magnifying glasses, 12 spring seed varieties

### Overview

This lessons guides students in using tools, guide books and communication to explore plant parts and stages. At the observe station, students investigate the structure of a flower and make connections about how these different parts help complete the flower function. At the explore station students complete a puzzle model the life cycle of plants in the garden and relate the life cycle sequence to planting options. At the garden station students use guide books to identify the sprouts of the spring seeds planted earlier in spring. They then use this information to remove weeds that have also sprung up. As students are supported in looking at the garden in a new way and making their own connections between observations and concepts, they will come to value to garden as proud stewards.

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## Garden Lesson: Patterns in Plant Growth

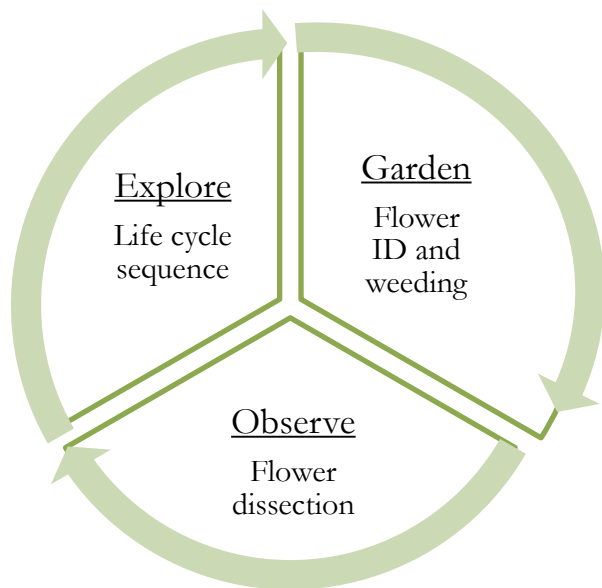
Season: Spring

Grades: 4<sup>th</sup>, 5<sup>th</sup> & 6<sup>th</sup> Grade

5 minutes Introduction

- Welcome & review expectations
- Discuss the term life cycle. What does it mean? How does it apply to plants.
- Break into three groups for station time

20 minutes Station Rotation (5 minutes per station + 1 minute for transition)



### Observe: Flower Dissection

Materials: Flowers, tape/glue, “Exploring Flowers” worksheets, magnifying glasses, scissors

- Have students share observations about flower characteristics
- Explain the role of flowers in a plant lifecycle and use diagram to show parts of a flower
- In partners, have students use scissors to dissect the flower and categorize the different parts on the worksheet
- Use magnifying glasses to observe different parts
- Compare results from different flowers.

### Explore: Annuals and Perennials

Materials: Plant life cycle poster, plant hardiness zone maps, seed packets, “What Can I Plant”

- Share the plant life cycle poster; invite students to share observations
- Have students complete the plant life cycle puzzle
- All plants follow this sequence, but the time to complete the cycle varies. Explain difference between annuals and perennials.
- Use “The Right Plants” handouts for guidance
- Pass out seed packets and have students complete the “What Can I Plant” worksheet to identify the details of planting for each plant.
- Discuss answers

### Garden: Sprout ID and weeding

Materials: ID guide of spring plants as two week and four week sprouts, magnifying glasses, 12 spring seed varieties

- Choose a few of the spring plant varieties that were planted in the garden earlier in the spring using the square foot planting method.
- Show the examples of the chosen seeds the plants started as and then look at them as sprouts in the pictures.
- Search for these sprouts in the garden and remove weeds that may be growing.

5 minutes Conclusion: What Can You Do?

- Have students share what they learned.
- Why is it important to know about the plant life cycle?

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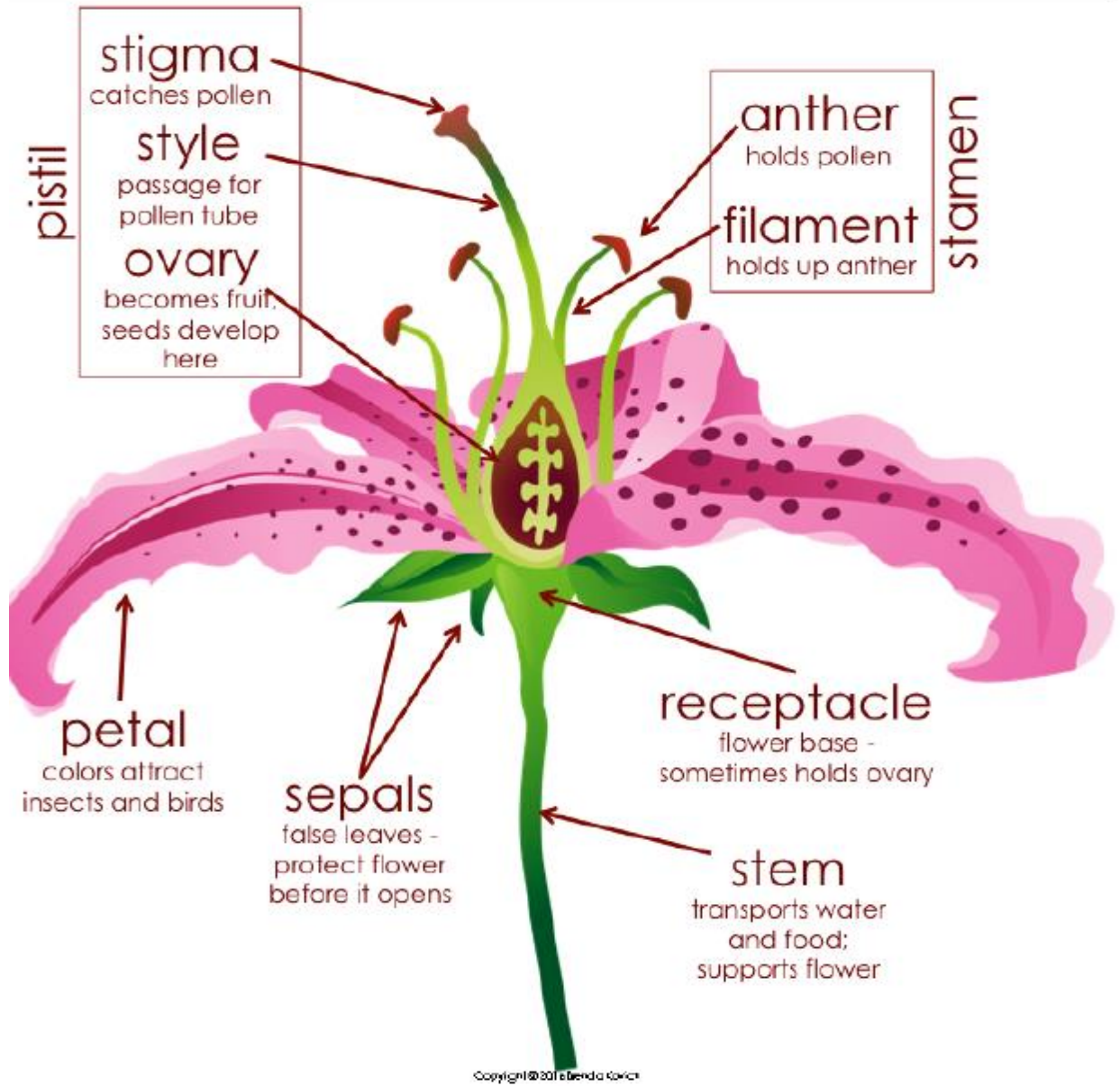




## Flower Dissection

For seeds to develop, pollen must land on the stigma. Then a pollen tube forms and stretches down into the ovary. A seed is formed.

A few plants can be pollinated by wind, but most require help. Insects, bats, and birds are pollinators. Pollen sticks to their bodies as they drink nectar from the flower, and the pollen drops off as they travel from flower to flower.



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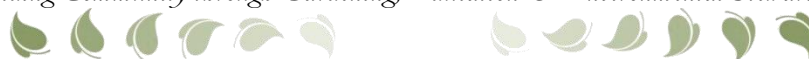
# Exploring **FLOWERS**

Name \_\_\_\_\_

Dissect the flower. Draw, count, and measure each part.

	Draw & label parts.	Count and record number.	Measure and record length.
petals			
stamen			
pistil			

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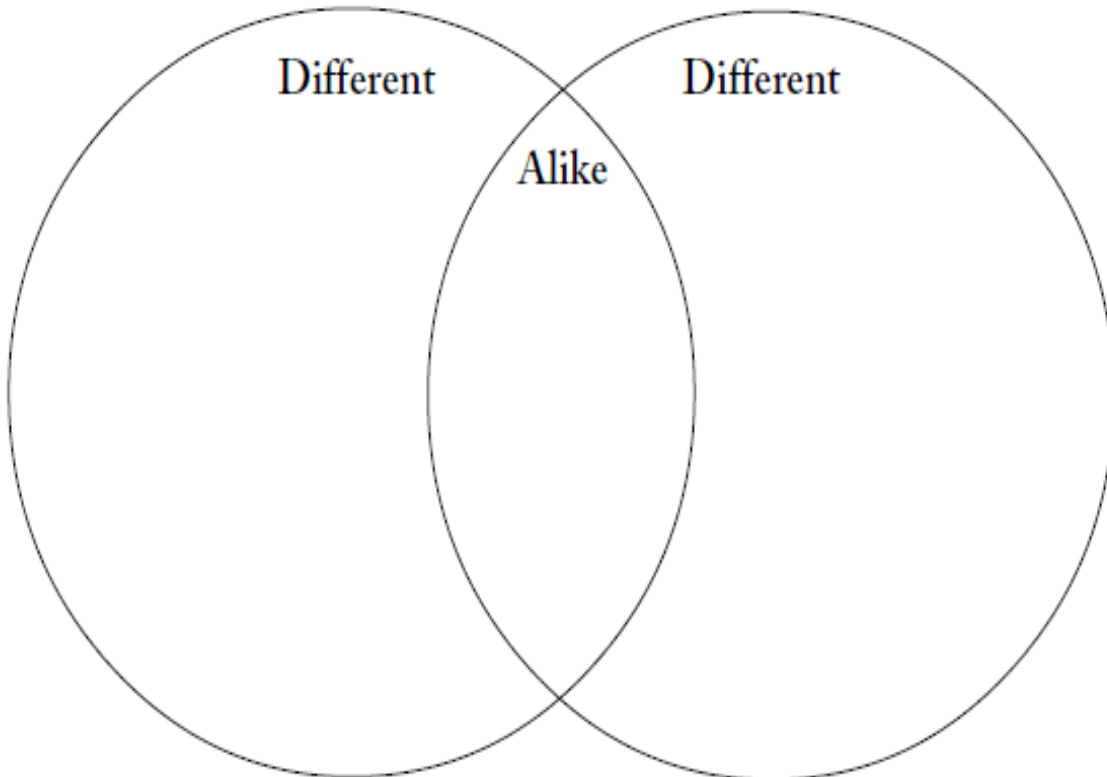


# Garden Lesson: Patterns in Plant Growth

Season: Spring  
Grades: 4<sup>th</sup>, 5<sup>th</sup> & 6<sup>th</sup> Grade

**Discovering Plants** **Fruit and Seeds—Student Handout Two**

## VENN DIAGRAM



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Explore Station: Background information/discussion points

name \_\_\_\_\_

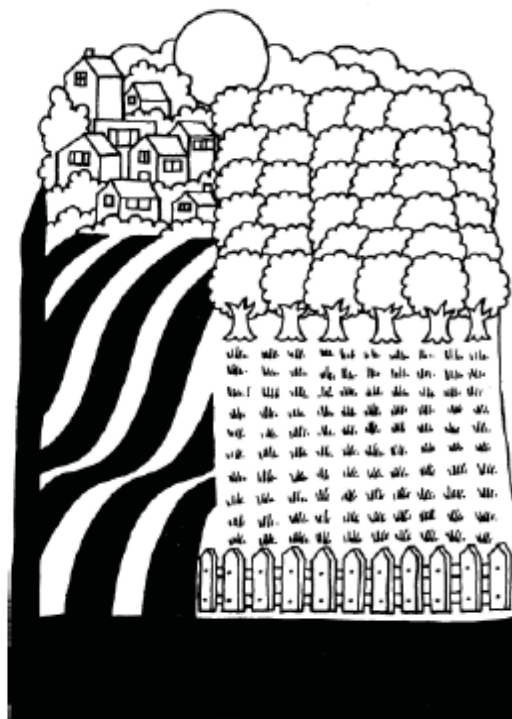
### Student Lesson: The Right Plants Why does it matter?

We must know about the plants we want to place in our gardens and yards, in order for them to be successful.

**Annuals** are plants that grow for only one season in our area. Not all vegetables are **annuals**.

Many flower plants are **perennials**. This means that the root system can live through the winter and send up new leaves in the spring.

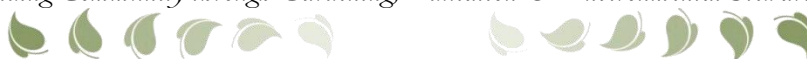
**Climate** affects what plants we can grow and when we can plant them. To find out the best time to plant, we can look at a map of the planting zones in the United States. You can find an interactive map at: <http://www.usna.usda.gov/Hardzone/ushzmap.html> Each color on the map represents the average range in temperatures. The blue zones get very cold and not very warm in the summer. The brown zones stay warm all year and might get very hot, especially in summer. Most seed packets have a planting zone map on them.



A major part of having healthy plants is planting them in the right place. You should have fewer problems with disease and insects when **perennial** plants are in the best spot. Vegetables will also produce better when they have been chosen well and grown under the most favorable conditions. Integrated Pest Management (IPM) starts with making the best choices.

The key to success is: the right plant, in the right place!

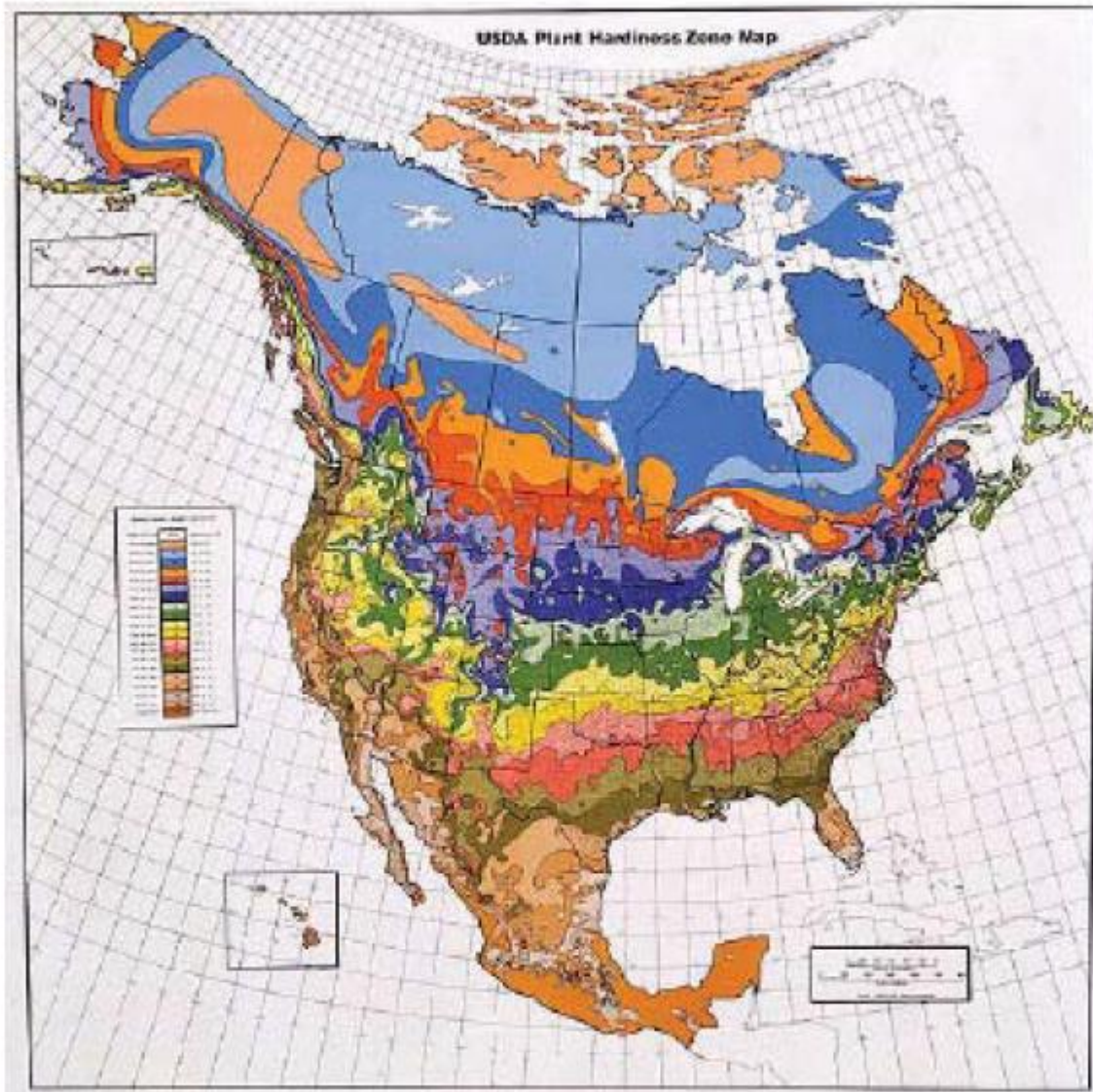
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## Garden Lesson: Patterns in Plant Growth

Season: Spring  
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Student Lesson: The Right Plants  
Plant Hardiness



To be successful farmers or gardeners, we must learn about the needs of the plants and the environment we want to plant in. We must remember to consider the sun, water, and soil conditions, as well as the size of the plant when it is **mature**. (Don't plant a tiny tree seedling right next to your house! It won't always be small!) Is the plant **annual**, and does it have a long enough season to grow and flourish? Is it a **perennial**, and will it be successful where we plant it for years to come?

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### What Can I Plant?

Deciding what to plant in your garden can be a challenge! There are many factors involved in determining what can be planted. One of these factors is the life cycle of the plant. Luckily, the information provided on the back of the seed packets can be very helpful!

To figure out if something will grow in your garden, look at the:

1. Seed type \_\_\_\_\_
2. Zone \_\_\_\_\_
3. Days to harvest \_\_\_\_\_
4. Annual or perennial \_\_\_\_\_

Once you've figured out if the plant will grow in our area, look at the planting specifics:

5. Spacing \_\_\_\_\_
6. Depth \_\_\_\_\_
7. Sun requirements \_\_\_\_\_

