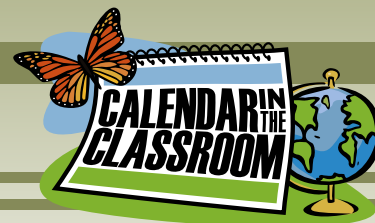




# Growing Timeline



## Overview

The central question is, How is the growing season of a particular plant affected by variables? In answering this question, students will create a growing timeline for a plant.

## Standards/Benchmarks \*

Describe how plant and animal structures and their functions provide an advantage for survival in a given natural system. Science (5.4.1.1.1)

Humans change environments in ways that can be either beneficial or harmful to themselves and other organisms. Science (5.4.4.1.1)

## Background

All seeds need soil, water, sunlight, and air in order to grow, although different seeds need them in varying degrees. Some seeds sprout rapidly, while others may take several days or more.

Regardless of the species of plant, when a seed sprouts it undergoes predictable growth: developing roots, stems, leaves and often flowers. Roots, with hair like extensions will usually sprout from the seed before or at the same time the stems or shoots will unfurl from the seed. The stems stretch up to reach for the sun (or other light source). Finally leaves will emerge, which capture the sun's energy and convert carbon dioxide from the air to make food for the plant.

If you allow them to grow long enough most plants also produce flowers, some showy like pansies; others less so, like grasses. The flowers make it possible for the plants to reproduce by seeds.

## The Activity:

### Warm Up

1. Read *The Tiny Seed* by Eric Carle
2. In their journals have the students write what they know about seeds and gardening.
3. Ask students to write down what they would like to know about seeds and gardening.
4. Discuss and share as a class.

### Day 1

1. Show the *Minnesota Weatherguide Environment™ Calendar* and direct the students to read the Grow with KARE sections in the calendars to help build background knowledge about planting and growing plants.

## Time:

- Day 1: 50 minutes
- Day 2: 30-40 minutes
- Day 3: 50 minutes
- Day 4: 30-40 minutes
- Day 5: 30 minutes
- Days 6-14: 5 minutes

## Skills:

- Writing
- Recording
- Data collecting
- Drawing
- Interpreting
- Predicting
- Drawing conclusions

## Vocabulary:

- growing season
- variables
- harmful
- beneficial
- interactions
- invasive

## Materials Needed:

- Current and old copies of *Minnesota Weatherguide Environment™ Calendar*
- white construction paper
- ruler/straightedge
- colored pencils or markers
- computers
- science notebooks
- *The Tiny Seed* by Eric Carle
- assorted garden seeds
- containers
- potting soil
- masking tape
- spray bottles filled with water

2. If you have access to computers have the students also look up:  
University of Minnesota Extension: [www.extension.umn.edu/garden/](http://www.extension.umn.edu/garden/)  
Minnesota Landscape Arboretum: [www.arboretum.umn.edu](http://www.arboretum.umn.edu)  
Minnesota Climatology Working Group: [www.climate.umn.edu](http://www.climate.umn.edu)  
Grow with KARE links: <http://www.kare11.com/life/lifestyle/grow/default.aspx>
3. Once they have had the opportunity to explore the resources, have them choose a single plant to create a growing timeline. (tulip, tomato, radish, beets, green bean, corn, turnip etc.)
4. Using a straight edge and a pencil have them draw a timeline on white construction paper. Below the line they should list all the months of the year evenly spaced.
5. Their timeline should include: when and how their seed/bulb needs to be planted, how it should be watered, how frequently it should be watered, fertilizer or no fertilizer, when it germinates, when it reaches full growth, when can you harvest, etc.
6. Above the line have them illustrate what is going on with their plant and below the month have them write what is happening with their plant and tips for growing. Every month should have information even it is repeated information from the previous month if that is the case.
7. Allow time to research using calendars and websites.

### Day 2

1. Time to work on timeline.

### Day 3

1. Have a class discussion on interactions humans have with gardens and growing plants. .
2. Included under the months they should write what interaction could happen during that month.

### Day 4

1. Time to plant some seeds. Have students plant a selection of common garden seeds in small containers. Fill the containers  $\frac{3}{4}$  full of dry potting soil, then use the spray bottles to wet the potting soil (students will have to stir the potting soil). Once the potting soil is thoroughly wet seeds should be planted about  $\frac{3}{4}$  of an inch below the surface. Label each container with the date and the student's name.

A couple of hints: Radish seeds sprout and grow quickly—1 to 2 days to sprout and up to 2" in 3-4 days. Green bean seeds take 3-4 days to sprout, and 4-5 to break through soil surface. Students may want to take seeds home to grow or provide a place in the schoolyard where they can plant them.

## Wrap Up & Assessment

### Day 5:

1. Have the students meet with a classmate that researched a different plant than their own. They should take turns and share their poster and what they learned.
2. After five-seven minutes have them rotate and find another classmate to meet and share with.
3. Have them meet with as many classmates as time permits.

### Days 6-14

1. Students should observe their seeds daily and record results in their journals or science notebooks.
2. Once the seeds start to sprout, students should measure and record the length of the sprouts and roots.
3. Students can prepare line graphs of the growth of their seeds and compare those to other types of seeds.

## Questions for Discussion

· Why do plants have different timelines? Plants have different timelines because of their need for different soil temperatures, nutrients, moisture levels, and sunlight. These needs are met at different times throughout the year.

## Extensions:

- Compare and contrast the growing timeline of an annual versus a perennial.
- Grow the plant they wrote a timeline for.

## Resources:

Carle, Eric: *The Tiny Seed*

University of Minnesota Extension: [www.extension.umn.edu](http://www.extension.umn.edu)

A resource for additional information about growing crops and the conditions needed.

Minnesota Landscape Arboretum: [www.arboretum.umn.edu](http://www.arboretum.umn.edu)

Breaks down gardening tips by seasons.

Minnesota Climatology Working Group: [www.climate.umn.edu](http://www.climate.umn.edu)

Contains information about agricultural climate data.

*Minnesota Weatherguide Environment™ Calendar*

## \* Minnesota State Scademic Standards

### Standards Met

Subject	Code	Standard	Benchmark
Science	5.4.1.1.1	Living things are diverse with many different characteristics that enable them to grow, reproduce and survive.	Describe how plant and animal structures and their functions provide an advantage for survival in a given natural system.
	5.4.4.1.1	Humans change environments in ways that can be either beneficial or harmful to themselves and other organisms.	Give examples of beneficial and harmful human interaction with natural systems.