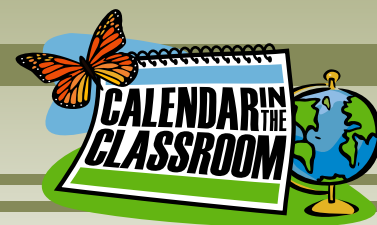




# Awesome Autumn



## Overview

Students will collect leaves, sort them by color and create a color graph. The *Minnesota Weatherguide Environment™ Calendar* serves as a resource for fall leaf color and other phenological events.

## Standard/Benchmarks \*

- Use counting and comparison skills to create and analyze bar graphs and tally charts. Math (1.1.1.7)
- When asked "How do you know?" students support their answer with observations. Science (1.1.1.1.1)
- Describe and sort animals/plants into groups in many ways, according to their physical characteristics. Science (1.4.1.1.1)

## Background

Phenology is the branch of science dealing with the relationship between climate and periodic seasonal occurrences in nature, such as the blooming of flowers, changing leaf color, bird migration, ice-out on lakes.

Fall leaf color is a delightful and easily observed phenological event - the process of the plants responding to changes in day length, temperature and water availability their conditions are all related to the end of the growing season.

Although the students may be excited by the bright colors, the processes of sampling and graphing are the real focus of this lesson. We collect our samples. We observe. We record our observations. We analyze our findings, and we graph our conclusions. Graphs tell a story! They are a way to use numbers to make a picture of observations.

Sampling is the process of selecting a small quantity of something to represent the total. Scientists usually use a random sample, but in this case the children are given some freedom to choose their own leaf sample.

As you direct students to collect leaf samples remind them to respect living things. Choose only 10 fallen leaves. At the end of the lesson these leaves can be returned to the collection site to emphasize recycling in nature.

The children may notice that some trees are shedding leaves while other trees will remain green all winter. Coniferous trees (evergreens) have needles instead of leaves and their color may darken in winter. Deciduous trees shed their leaves on a seasonal schedule. The intensity of color in the leaves is determined by the species of trees and by the environmental conditions. Cool nights and sunny days usually yield the most beautiful colors.

## Time:

60 min. In the fall

## Skills:

- Observing
- Sorting
- Interpreting
- Drawing conclusions

## Vocabulary:

- graph
- phenology
- observation
- senses
- sampling
- deciduous
- evergreen

## Materials Needed:

- *Minnesota Weatherguide Environment™ Calendar*;
- Leaves collected by students
- Graph paper
- Crayons
- A variety of picture books about leaves (see resource list)

## The Activity

### Warm Up

Read aloud a picture book about autumn and/or leaves.

1. Begin discussion by asking students if they have noticed any changes in the trees since school started? What changes do they notice?
2. Show students a fall photo from the *Minnesota Weatherguide Environment™ Calendar* or other resource. Discuss everything they notice. (Picture should include trees showing leaves of various colors.) What colors of leaves do they notice?
3. Read the phenology facts for the current month in the calendar. (Recommendation: Share just the facts related to foliage, leaf colors and weather conditions.)
4. Explain that students will be studying math and science today in the outdoor classroom. Establish expectations for outdoor classroom behavior. (We don't run and shout in our indoor classroom – or our outdoor classroom.)
5. Take students for a hike where they will be able to collect leaves. Explain that they will work in teams of two and may pick up leaves anywhere along the hike, but they need to have 10 leaves of various colors by the end of the hike.
6. Return to the classroom with leaves and have students sort their individual leaves by color.
7. Explain to the students that they will be making a graph showing the colors of the leaves that they have collected. Remind the students that the graph made by each team may be different and will show the variety of colors collected. Students may not have every color.
8. Hand out autumn leaves graph. Circulate around the classroom to help students complete their graphs.

## Wrap Up & Assessment

Have children read and compare their graphs in small groups or display on the board for all to see. Students should have graphs properly labeled and should be able to explain the information conveyed in the graph.

## Questions for Discussion

- Why do our graphs differ from each other?
- What color in your group appears most often? Least often? Why do you think that is so?
- If we made a whole class graph, what color would appear most often?

## Extensions

### Science/Math

- Sort the leaves by different types.
- Identify what trees the leaves came from.
- Encourage other types of graphing to organize information.

### Language Arts

- Have a basket of books about fall leaves for the students to explore. Share/read a nonfiction book.
- Review the phenology facts contained in the calendar. Did any of them match with what the students found? If not, discuss why?

## Resources

Ehlert, L. *Red Leaf, Yellow Leaf*

Robbins, K. *Autumn Leaves*

Minnesota Weatherguide Environment™ Calendar

## \*Minnesota Academic Standards

### Standards Met

Subject	Code	Standard	Benchmark
Math	1.1.1.7	Count, compare and represent whole numbers up to 120, with an emphasis on groups of tens and ones.	Use counting and comparison skills to create and analyze bar graphs and tally charts.
Science	1.1.1.1.1	Scientists work as individuals and in groups to investigate the natural world, emphasizing evidence and communicating with others.	When asked "How do you know?," students support their answer with observations.
	1.4.1.1.1	Living things are diverse with many different observable characteristics.	Describe and sort animals/plants into groups in many ways, according to their physical characteristics and behaviors.