

Teacher **Treesources**

WHY LEAVES CHANGE COLOR

This is an age old question that many teachers are asked, and it can be a starting point of a number of important lessons. The beautiful leaves of fall are a perfect way to draw students' attention to many science topics from seasonal change to photosynthesis to winter plant adaptations.

- In the lower grades students learn about how living things must meet their basic needs. Seasonal change and how plants deal with winter is a large part of this understanding.
- In middle school students learn about cellular structure and leaves are a perfect way to show the relationship between structure and function on a smaller level. A leaves role in energy transfer is an integral part of photosynthesis.
- In high school students delve deeper into the cellular process and understanding leaf structure is one way to get a better grasp of photosynthesis and cellular respiration.

Background

Every year as the days shorten and temperatures drop, deciduous trees go through a magical change as they prepare for winter. Their leaves begin to change from green to bright reds, oranges and yellows and eventually fall off the tree. What causes this color change? Leaves manufacture food for the tree using chlorophyll, cells that give the leaf its green color, and take energy from the sun. The leaves combine this energy with carbon dioxide and water to form sugar (glucose) and

oxygen in a process called [photosynthesis](#). During the growing season, chlorophyll is continually produced, but as cooler weather arrives, production slows down and eventually stops. This loss of chlorophyll exposes [other pigments](#) that have been present in the leaf all summer, turning the leaves brilliant reds, oranges and yellows. The activities and resources listed below will give more detailed information and provide activities to give first hand experience with this concept.

Activities

[Observing Color Changes in Leaves](#) (preK-1) – Collect green leaves and document their color change.

[Leaf Life Cycle Lesson Plan](#) (Grades K-2) – After reading *Fall Is Not Easy* by Marty Kelly, discuss the changes a tree goes through every year.

[Autumn Leaves Science Projects](#) (Grades 3-8) –

Using chromatography, separate colors in a green leaf and a fall leaf. Next, observe how light affects color development in leaves.

[Fall Slumbers](#) (Grades 3-8) – Students will observe the changes in a selected tree leaf at their homes over the course of several weeks.

Resources

Web sites:

[Why Leaves Change Color](#) – Learn where the colors come from and how weather affects fall color.

[The Structure of a Leaf](#) – Take a look inside a leaf to learn where photosynthesis takes place, where colors are stored, and how water and nutrients are transported throughout the leaf.

[Fall Color in Ohio](#) – Learn tree identification and which trees turn which colors.

Video:

[Leaf Color Change](#) – Watch a time-lapsed video of a leaf changing color.

[Leaf Pigment Chromatography](#) (Grades 9-12)

– Watch a science lab that demonstrates which pigments of leaves are separated using paper chromatography.

Books:

[Fall Is Not Easy](#) (Grades PreK-1) - Proclaiming fall the hardest season of the year, a tree struggles to change its colors.

[Autumn Leaves](#) (Grades K-3) – Learn basic tree and leaf identification in this photo album of autumn leaves.

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