



Why Do Leaves Change Colors in the Fall?

One characteristic of autumn, enjoyed in many parts of the world, is the dazzling array of leaf colors on **deciduous** trees. People travel to the Northeastern United States and other areas just to see the bright yellows, oranges, and reds of the leaves. But why does the change occur?

First, it's helpful to understand why most leaves appear green at other parts of the year. You might already know that many plants collect sunlight and convert it into glucose, which is a type of sugar the plant can use to help it grow and carry out other functions, through a process called **photosynthesis**. As the days grow shorter in the fall, there are fewer hours of sunlight, and the pigment **chlorophyll**, which carries out photosynthesis, begins to break down, revealing the other pigments and colors present in the leaves.



Digging a little deeper:

The colors we see are actually the ones being reflected back to us. The wavelengths of light (colors) we *don't* see are being absorbed.

RELATED HOLIDAY THIS WEEK:



ACTIVITY: Leaf Identification

Collect a number of different leaves from the area around your home, while out on a hike, or during a visit to the local park. Then, try to identify them!

Click [here](#) to learn more about this activity.

EXPERIMENT: Separating the Pigments

Have an adult help you with this project, be sure to wear eye protection (goggles), and work in a well-ventilated space. Do not consume any part of this project. Read through all directions before beginning. To make this a true experiment, hypothesize (kind of like making an educated guess) what colors you think will show up on each of the coffee filter strips and make a note of your hypotheses.

You will need:

- ❖ 3 Green leaves collected from 3 different types of trees
- ❖ 1 Each: Yellow/orange/red leaves
- ❖ 7 Small glass jars (such as baby food jars)
- ❖ Rubbing alcohol
- ❖ Masking tape
- ❖ 7 pencils or twigs
- ❖ Black marker
- ❖ Coffee filter, cut into strips that are 1-inch wide (If you don't have coffee filters, paper towels will also work)

Instructions:

- 1) Place a strip of masking tape around each of the jars.
- 2) Select one of the green leaves you collected. If you're able to identify the type of tree/leaf, label the first jar with that species name (for example, "Dogwood") and the word "Green" (or label it "Green - A" if you don't know what species it is).
- 3) Tear/crush/break up the first leaf into tiny little bits and put the pieces in the labeled jar.
- 4) Repeat steps 2 and 3 for the remaining two green leaves (labeling with plant name or "Green - B" and "Green - C").
- 5) Have your parent/guardian pour enough of the rubbing alcohol in each of the labeled jars to cover the crushed leaves.
- 6) Tape one end of a coffee filter strip to each of three pencils/twigs and cut the length as needed so that the other end of the coffee filter strip reaches the rubbing alcohol when the pencil/twig is set across the top of the jar.
- 7) Once all three green leaves have been processed in this way, do the same process for the yellow/orange/red leaves.
- 8) Label the seventh jar "black marker". Use the marker to draw a line about an inch from the bottom of the strip, and make sure the bottom reaches the rubbing alcohol like with the other jars.
- 9) Let the setup sit for a few hours or overnight (make sure that it's not located somewhere that a family pet or young child could get into it), until colors have extended partway up the strips, then set them on clean paper towels to dry. (It might be helpful to label each paper towel to match the jar labels to help you keep track of which is which.)
- 10) Analyze the difference between the various species' leaves, as well as between green and non-green leaves. What colors are present on the strips? The bands of green are from the pigment chlorophyll. Revisit your original hypotheses. Were there any colors that showed up (meaning that pigments existed in the leaf) that you weren't expecting? Did any green show up on the strips used to test the yellow, orange, and red leaves?
- 11) For fun, check out the way that the inks from the marker spread out. Often, it's more than just black ink in a black marker. What color pigments did you notice? This portion was similar to what's called "ink chromatography".

*Note: Rubbing alcohol may be dangerous for aquatic life, so it's best to consider it hazardous waste and dispose of it as such, rather than pouring it down the drain where it can harm living beings or mix with other chemicals and cause additional problems.

CRAFT

What awesome nature designs can you make using vibrantly colored leaves?



Images from [Childhood by Nature](#). ← Click the link to see more!



RELATED VIDEO LINK

Watch this video to learn more:

[Why Do Leaves Change Color?](#)

Vocabulary

Chlorophyll - pigment present in green plants; it's what collects sunlight, water, and carbon dioxide and transforms those materials into sugars/glucose and oxygen - and is also what makes them appear green

Coniferous - type of cone-bearing plant which typically has needle-shaped leaves; many hold onto these leaves through the winter, though some, such as the larch/tamarack, shed them

Deciduous - trees/plants that lose their leaves (and fruit) in the fall

Photosynthesis - the process by which sunlight, water, and carbon dioxide are converted into sugars and oxygen

Lessons & Activities For This Week Adapted from:

Project Learning Tree: Environmental Education Activity Guide



Thanks for joining me for this week's Home Explorer activities from the Umpqua Watersheds Education Program. There will be new lessons, projects, crafts (and more) posted weekly!

With smiles :)
~ Miss Ryan

