

Science Club Jr.

How & Why Do Leaves Change Color?



The days are getting shorter and colder, squirrels are busy burying snacks, and songbirds are flying south. How else can you tell winter is coming?

Many trees, bushes, and other plants are dropping their leaves. If leaves stayed on all winter, heavy snow and ice would collect on the leaves and the branches could break under the weight.



How do trees know it's time to drop their leaves?

Trees feel with their buds and leaves that the days are getting shorter. As they have to be awake to drop their foliage, they usually shed their leaves during the last half of October. Interesting fact: Trees also use the shedding of leaves as an opportunity to get rid of waste (it's like going to the bathroom once a year). Waste is transported into the leaves before they fall.

Why do leaves often change from green to colors like orange, yellow, brown, or red before falling?

Even though leaves appear just green most of the year, they actually have all different colors hidden inside all year round. Tiny pieces of different colors, called "pigments," give leaves their color.

During the warm seasons, trees (and other plants) need their leaves to give them energy (through a process called *photosynthesis*). The green pigments are most useful for this and they give leaves their color. When it gets cooler and trees get ready for resting, they no longer need as much energy. A lot less green is used and the other colors get their turns to shine.

Let's Experiment

Let's make the different pigments of a leaf visible through a process called "chromatography."

Supplies

- leaves of different colors
- a container for each color leaves (small jars or glasses)
- white vinegar or rubbing alcohol
- strips of paper towels
- scissors
- plastic wrap
- a bowl large enough to hold all the containers
- hot water
- a spoon



Instructions

1. Gather some leaves of different colors.
2. Sort your leaves by color.
3. Use your scissors to cut them in tiny pieces and put them into separate containers. You only need enough leaves to cover the bottom of each container.
4. Pour the alcohol or vinegar over the leaves in each container.
5. Cover each container with plastic wrap.
6. Pour some hot water into the bowl.
7. Set the containers in the bowl with hot water for about 30 minutes.
8. Take the jars out of the bowl, remove the plastic wrap, and mash up your leaves with a spoon.
9. Drape a strip of paper towel over the jar so that the paper towel touches the liquid and the rest of it hangs over your jar.
10. After about 3 hours, remove the paper towel strips and allow them to dry.



What colors are revealed?

My red leaves clearly have mostly red pigments, but the edges do have a greenish tint and those are the remaining green pigments from the summer.