



Colors in a Leaf

You might have learned that leaves are green because they contain a pigment called chlorophyll, which is used to capture sunlight. But leaves have more than just this pigment: other pigments are in the leaf to catch the light that chlorophyll misses. You can see these pigments when leaves start to change color in the fall.

Gather a green leaf from the different types of trees in your yard. Press leaves and paste them in your Environmental Science Journal, recording the date and type of tree. In the fall, when leaves change colors, gather an autumn leaf from each tree, press the leaf, and paste it next to the green leaf. Now you can see the colors—besides green—that are present in the leaf.

You can also see the different colors in a leaf using paper chromatography. Chromatography is a technique used to separate a mixture of chemical substances.

Materials: white coffee filter paper, green leaves from the same trees, a coin, rubbing alcohol, aluminum foil, pencil, tape, glass jar

Procedure:

1. Cut a strip of coffee filter paper one inch wide for each leaf that you have gathered. Cut one end of the strip so that it's pointed.
2. Place the leaf on the coffee filter paper, $\frac{1}{4}$ inch above the point. Rub the edge of a coin over the leaf, pressing the green leaf juice into the filter paper. Let the paper dry.
3. Repeat this for each of the leaves you have gathered, on different filter paper strips.
4. Pour rubbing alcohol into a tall jar, only $\frac{1}{2}$ inch high. Tape your paper strip to the middle of a pencil and hang it so only the pointed tip touches the alcohol. Do not let the alcohol touch the leaf juice. You might have to adjust the length of the filter paper strip. Cover the jar with aluminum foil to keep the alcohol from evaporating.
5. Watch the alcohol move up the filter paper strip—it will carry the pigments with it, and the pigments will separate. After 10-20 minutes the colors should be fully separated. Don't let the colors run all the way to the top of the paper. In some cases it may take longer.
6. Take the filter paper strip out of the alcohol and let it dry, then paste it in your journal next to the leaves you gathered.
7. Watch this same tree as it starts to turn color. What color did the leaves turn and could you see that pigment or pigments in your green leaf juice?



Colors in a Leaf Data Sheet

Type of tree: _____

Green Leaf Collected on Date _____

Date the leaves first started to change color: _____

Date all the leaves have changed color: _____

Color that the leaves changed: _____

Did those colored pigments separate from the green leaf juice? _____

Paper Chromatography Strip

(Glue here)

SCIENCE BUG CHALLENGE:

What are the names of the other pigments present in the leaf?

(You will need to look up the scientific name for each pigment.)