

It's Not Easy Being Green

An activity for 1 or 2 people

Materials

- black marker
- coffee filter
- scissors
- ruler
- rubbing alcohol
- 10-oz plastic cup (2)
- tape
- pencil
- spinach solution

What To Do

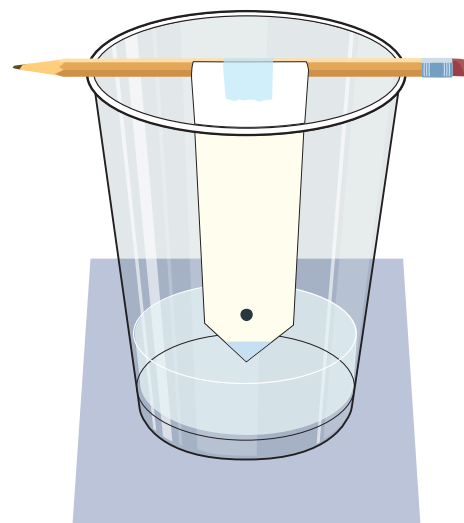
Most plants contain chlorophyll. Chlorophylls allow plants to make their own food using the energy they collect from sunlight. This process is called **photosynthesis**. You may be surprised to learn that plants can also have other chemicals in them that help with photosynthesis. Some of these are yellow, and some are orange.

Chromatography is a method scientists use to separate compounds. Find out how chromatography works and then use it to separate the chemicals found in green leaves.

Part A: The Colors in Black Ink

Many inks and dyes are made up of more than one color. Use chromatography to separate the hidden colors in a black ink sample.

1. Cut a strip of filter paper about 2 cm wide and 10 cm long. Cut a point at one end.
2. Draw a dot with the black marker about 1 cm from the pointed end of the strip.
3. Hang the strip in the cup by taping it to a pencil. Adjust it so that the point is just less than 1 cm from the bottom. Remove the pencil with the strip attached.
4. Pour about 1 cm of alcohol into the cup. Put the strip back in the cup. Make sure that the point is in the liquid, but that the dot is not. Adjust the paper if necessary.
5. Watch for a few minutes. What happens?
6. Begin working on Part B while the **chromatogram** develops. After 20 minutes or so, remove the paper and let it dry.



OVER ►

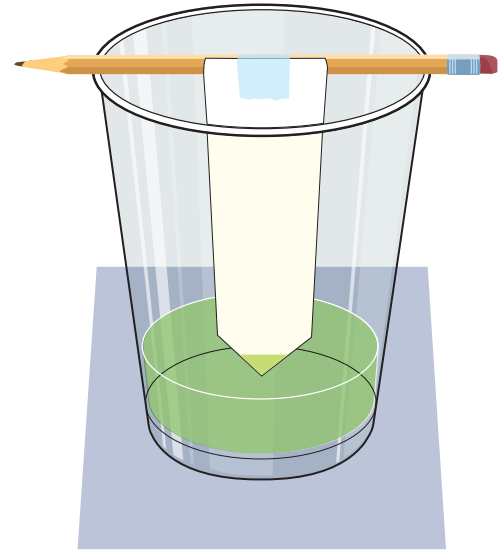
Purpose: Separate the compounds that are responsible for photosynthesis in green plants; make a chromatogram.



Part B: The Colors in Green Leaves

Chromatography can be used to separate the pigments in leaves. This will take longer than separating the colors in ink, so be patient.

7. Prepare a strip of paper and adjust it in a cup as you did in Part A. There is no ink dot in this test.
8. Pour about 1 cm of the spinach solution into the cup. Put the strip back in the cup. Make sure that the point is in the liquid. Adjust the paper if necessary.
9. After 30–90 minutes, remove the paper and let it dry.



Learn More!

Do this with an adult. Make chromatograms from the leaves of other plants. (Your teacher can explain how to make the solution.) Do they look the same as the chromatogram for spinach? You might want to try testing the same plant at different times of the year. Is there a difference in the chromatograms?



Describe the chromatograms you made in Part A and Part B.