



Activity: Leaf chromatography

Materials

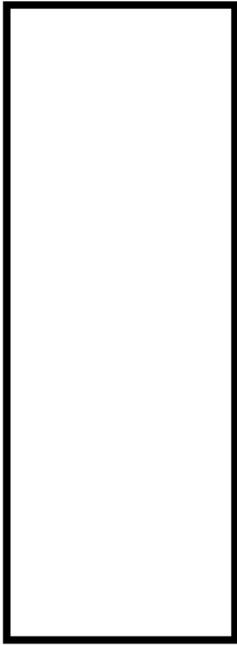
- Several leaves of different colors: green, yellow, and red
- Isopropyl alcohol
- Filter paper or coffee filters, cut into strips between 2-4 cm wide and 10-15 cm long
- Scissors
- Wooden spoon or mortar and pestle
- 3 250 mL beakers or clear glass jars of similar volume
- 25 mL graduated cylinder
- *Optional:* hot water bath: 9x13 glass baking dish filled about half way with hot water

Directions

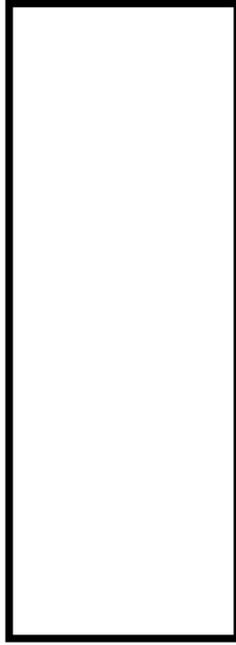
1. Separate your leaves by color so they are in three separate piles.
2. Using the scissors, cut each pile of leaves in to small pieces and place them in a jar or beaker. The smaller the pieces are cut, the more pigment will be released. Make sure that each beaker has only one type or color of leaves.
3. Pour between 40-50 mL of isopropyl alcohol in each jar so your leaves are fully immersed.
4. Mash the leaves in each jar with a wooden spoon or mortar and pestle. Again, the smaller the pieces, the more pigment will enter solution.
5. Set the jars with the leaves and alcohol mixture aside for at least 60 minutes. The longer you let the leave set, the more pigment will be released. *Optional:* You can speed up the process by placing the jars in a hot water bath.
6. Strain or remove the leaves from the beakers. At this point, the alcohol should have a good amount of pigments in solution and will have taken on the color of the leaves.
7. Place your filter paper in the beakers so that the bottom of the paper touches the alcohol and the top of the paper is over the side of the beaker. Set aside for at least 60 minutes.
8. Remove the filter paper and record your observations.

Observations

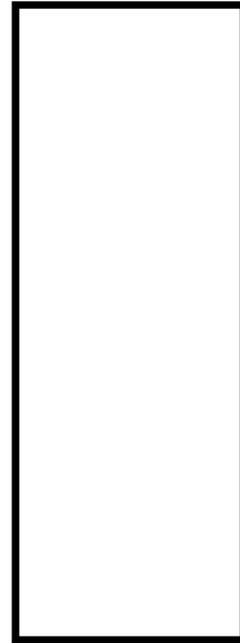
In the space below, draw the pigments that appeared on each of the filter papers using colored pencils. Label each pigment on the filter paper (green – chlorophyll, yellow – xanthophyll, orange – carotenoid, red – anthocyanin), then answer the questions below.



Green Leaves



Yellow Leaves



Red Leaves

1. Which pigments traveled the furthest up the filter paper. Which pigments traveled the least?

2. Which pigments did you observe in the solution from the beaker of green leaves? Were they different from the beakers of yellow and red leaves? If so, how?

Extension Questions

1. Most deciduous trees have leaves that appear green in the spring and summer. Why can you not see other pigments in the green leaves?

2. What is the advantage of a leaf having multiple pigments?
