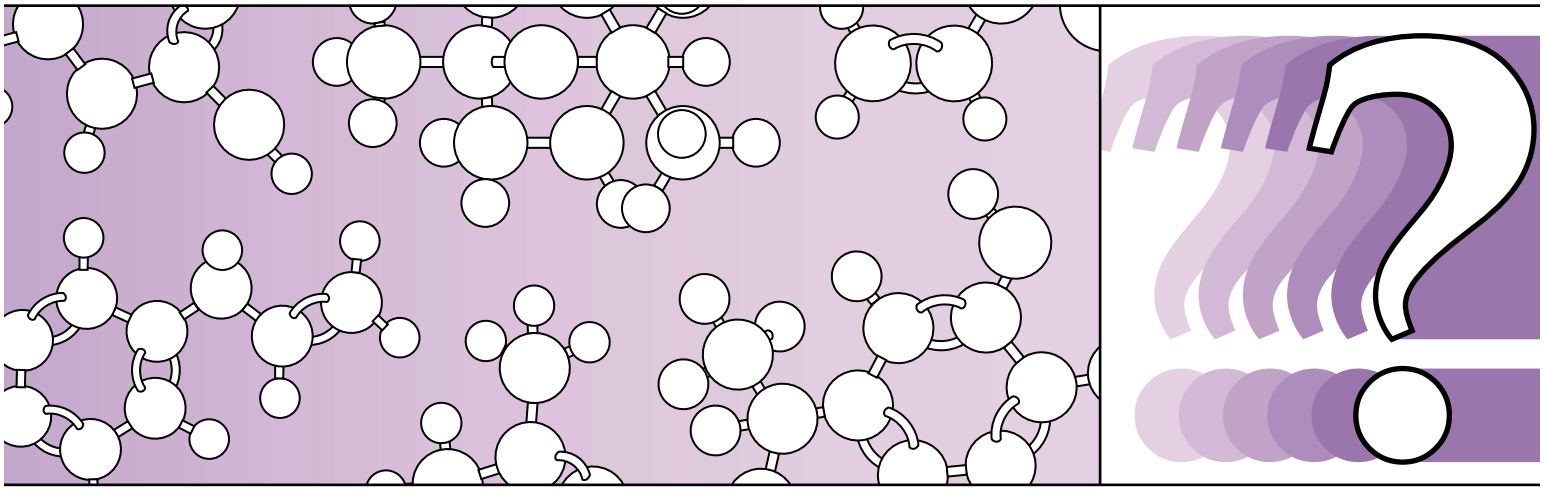
The Pfizer Foundation Biochemistry

Discovery Lab

What molecules give fall leaves their colors?



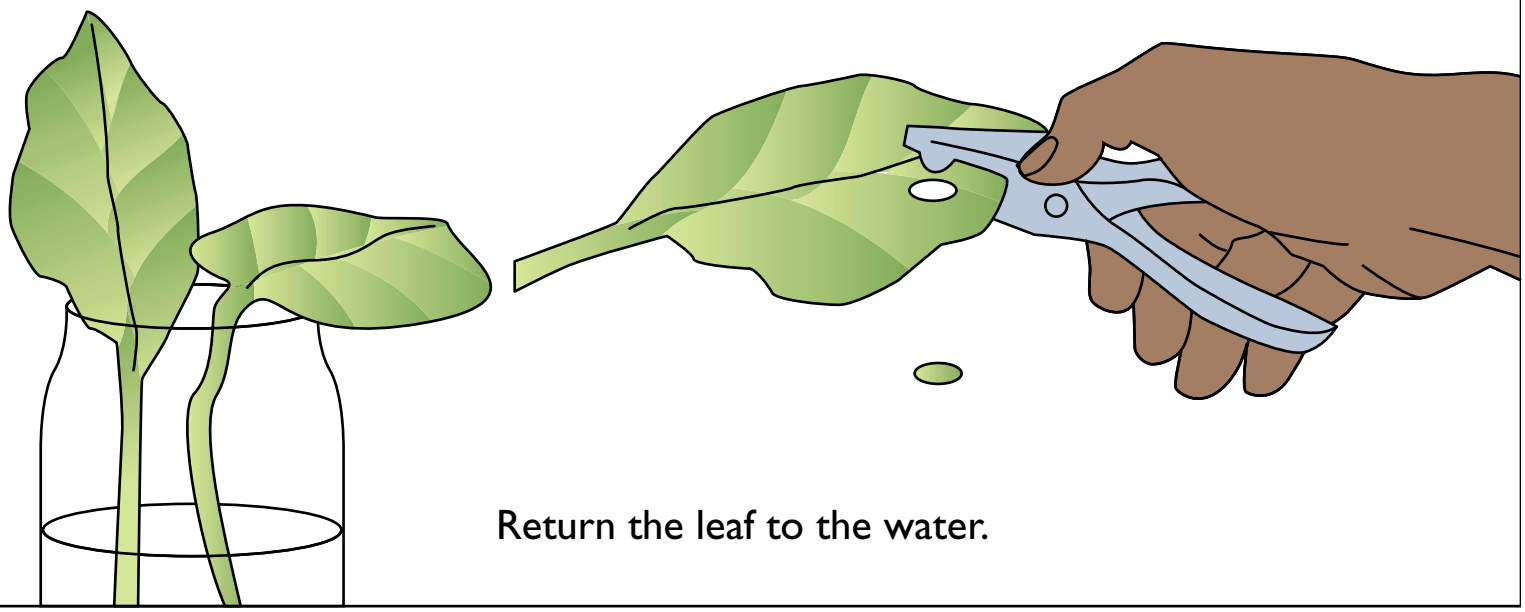
Have you ever wondered how leaves get their fall colors?

One of the fall colors is in leaves all year but is hidden until the fall.

Do an experiment to find out which fall color is hidden in green leaves.

Use the hole punch to make a circle of leaf.

Keep the circle that falls out.

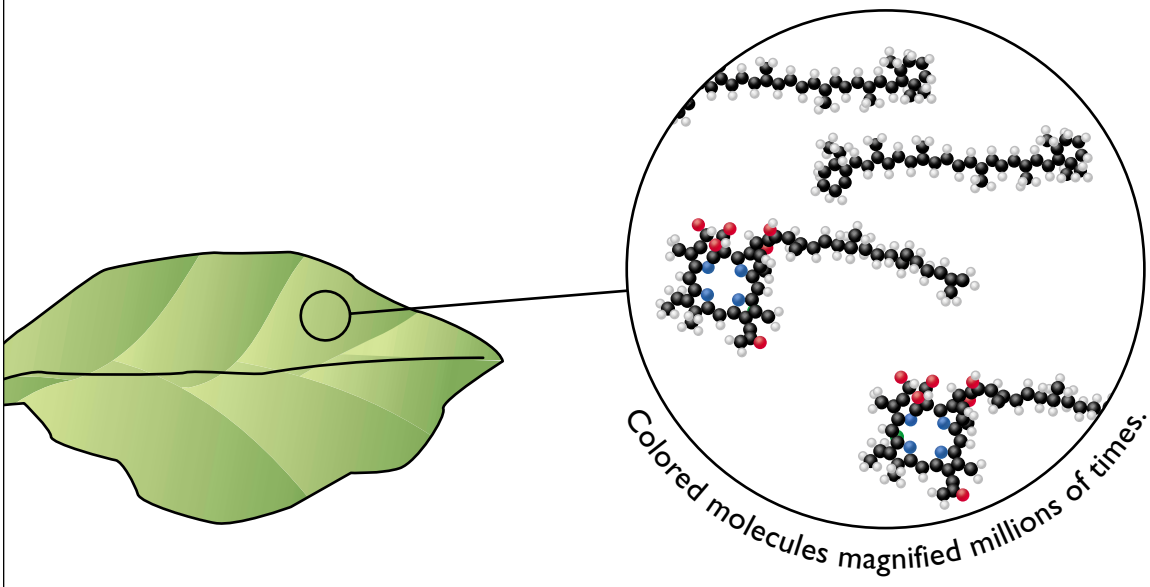


Return the leaf to the water.

More than one person in your group can do the activity.

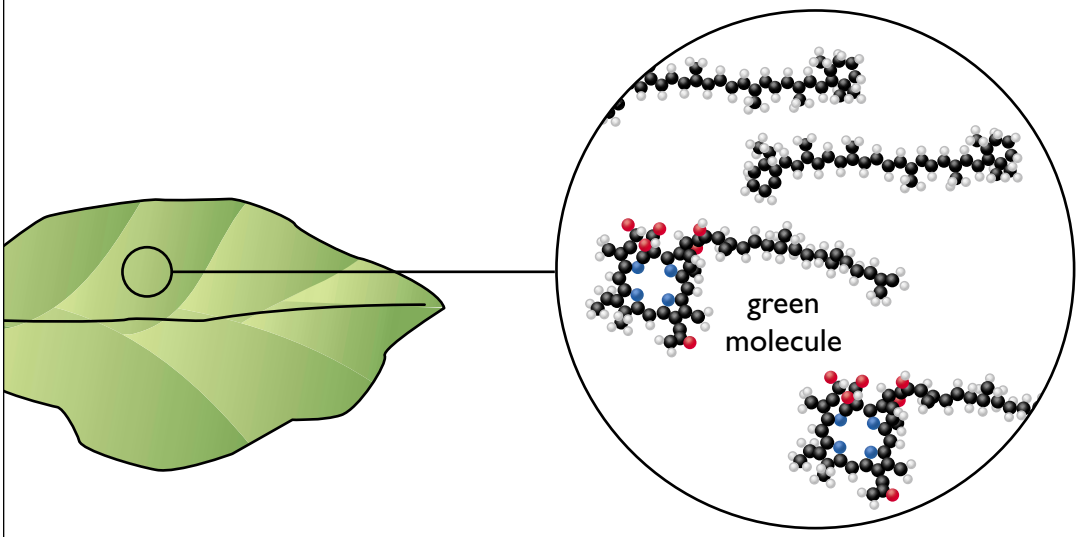
You can compare your results.

The leaf contains colored molecules.



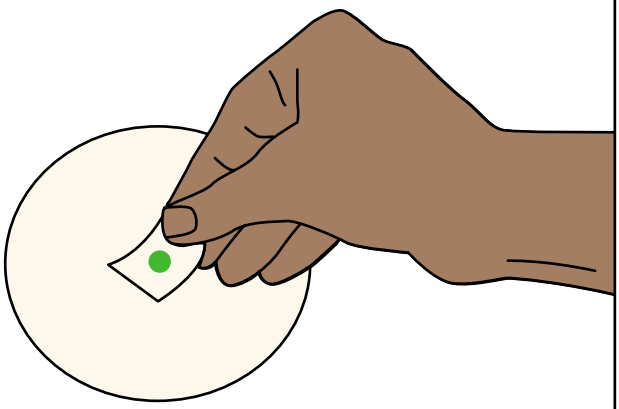
Molecules are tiny particles that make up all living things.

Some of the colored molecules in the leaf are green, and make the leaf look green.

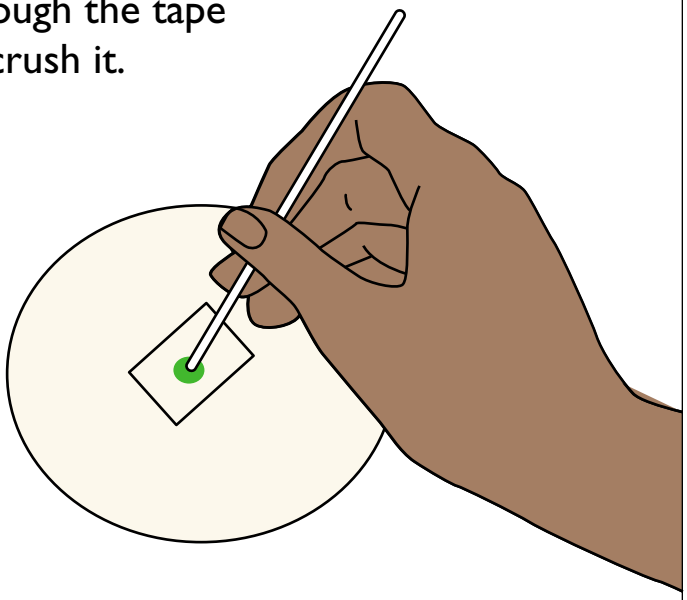


There is another color molecule in green leaves, but it is hidden by the green molecules until the fall.

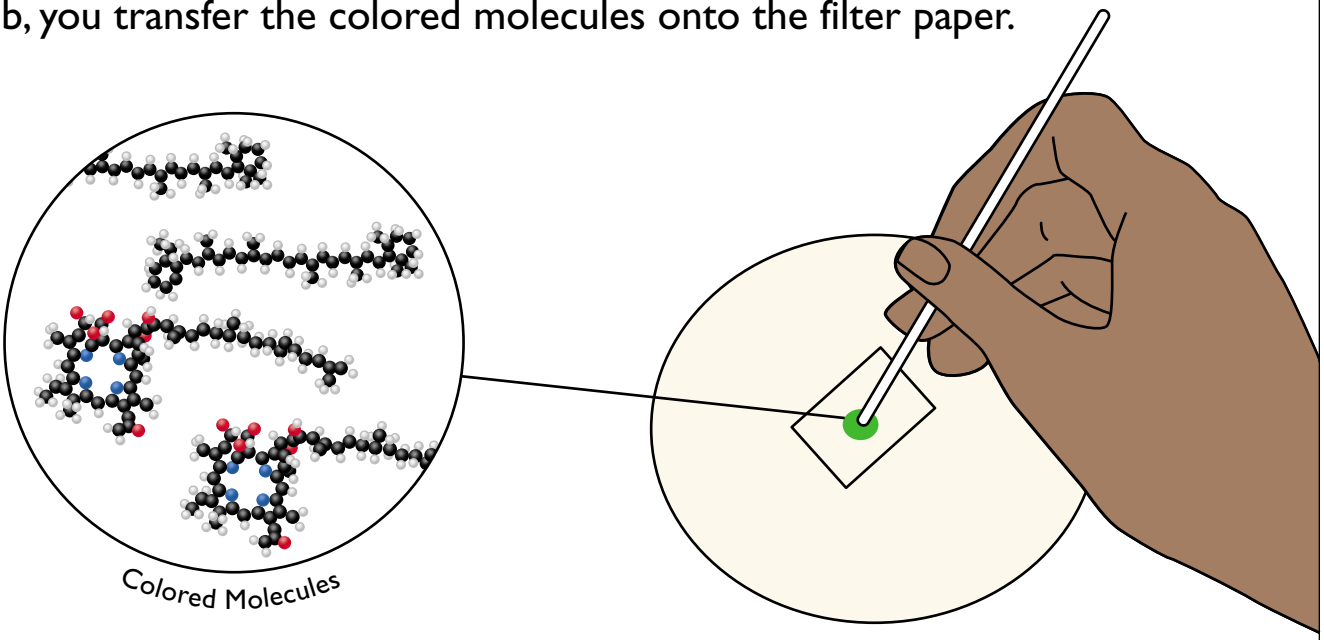
Tape the leaf circle to the center of a filter paper.



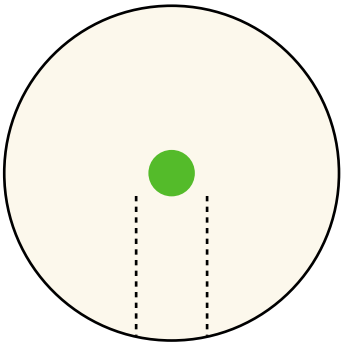
Rub the leaf circle through the tape to crush it.



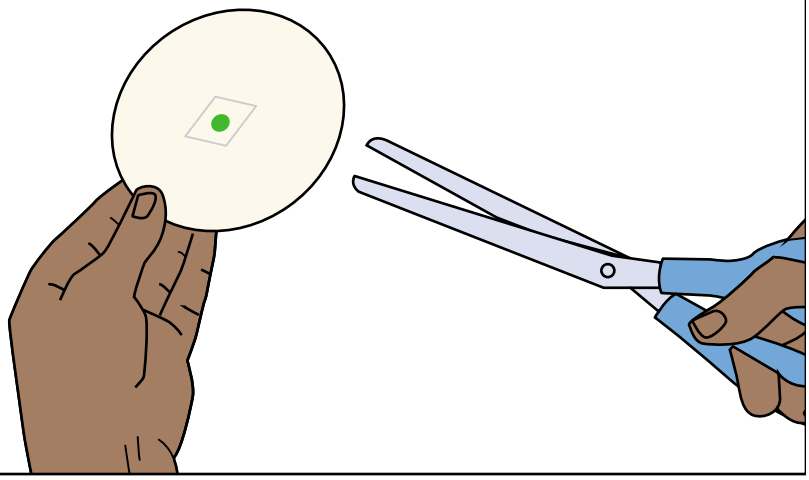
As you rub, you transfer the colored molecules onto the filter paper.



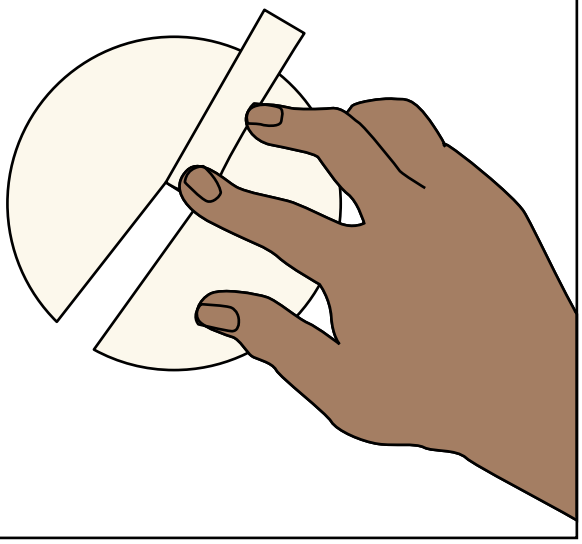
Cut a strip part of the way across the filter paper, following these dotted lines:



Make sure you cut right up to the green circle, but not past it.

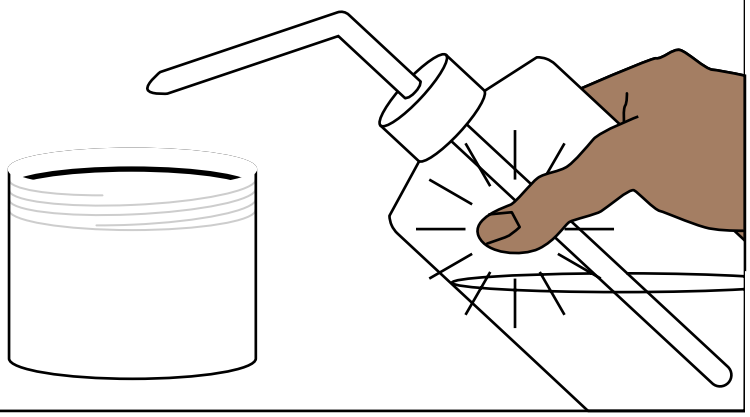


Fold the strip over.



Open the jar of alcohol and check that it is filled to the black line.

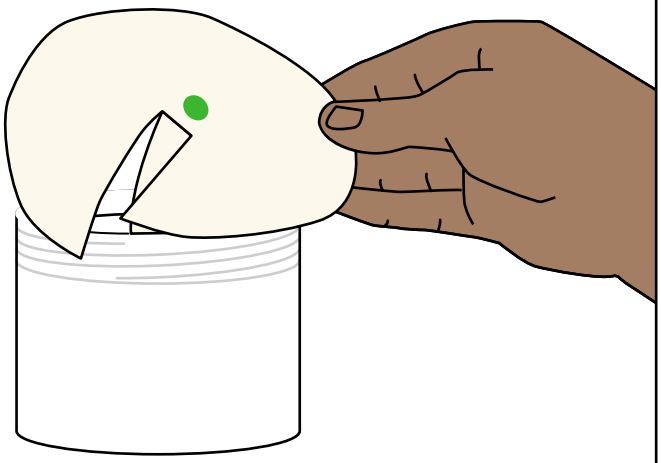
If not, add more alcohol.



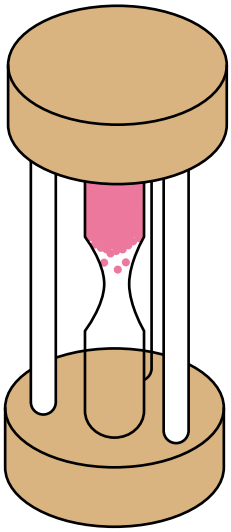
Turn the filter paper over and rest it on the jar of alcohol.

Make sure the strip hangs into the alcohol.

Don't push the filter paper into the alcohol.

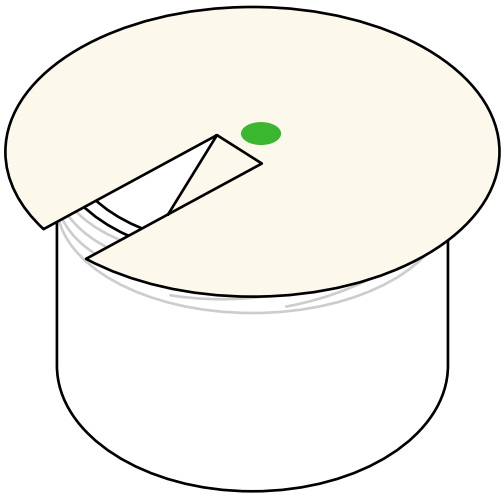


Start the timer.



The alcohol creeps across the filter paper and slowly separates the leaf molecules into their colors.

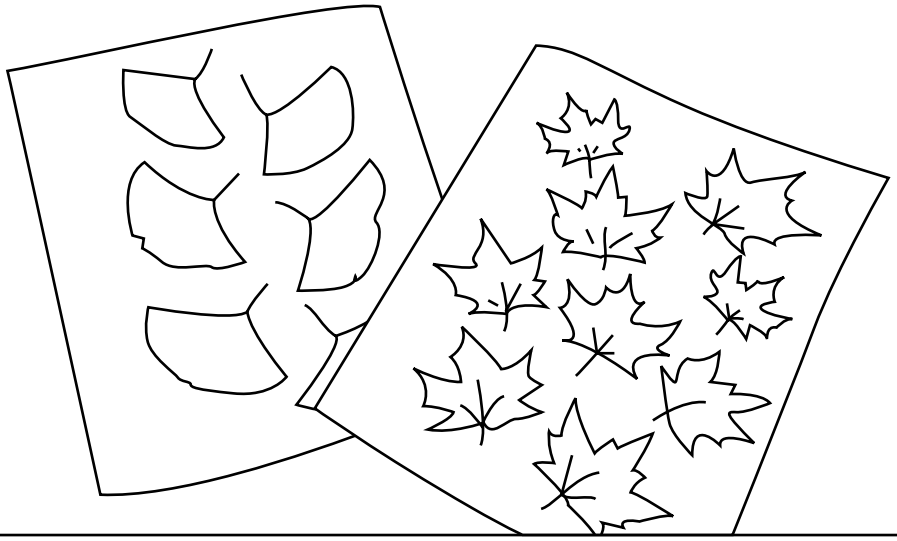
The alcohol does not change the colors, but shows you what colors are already in the leaf.



While you are waiting for the colored molecules to separate, read the next page.

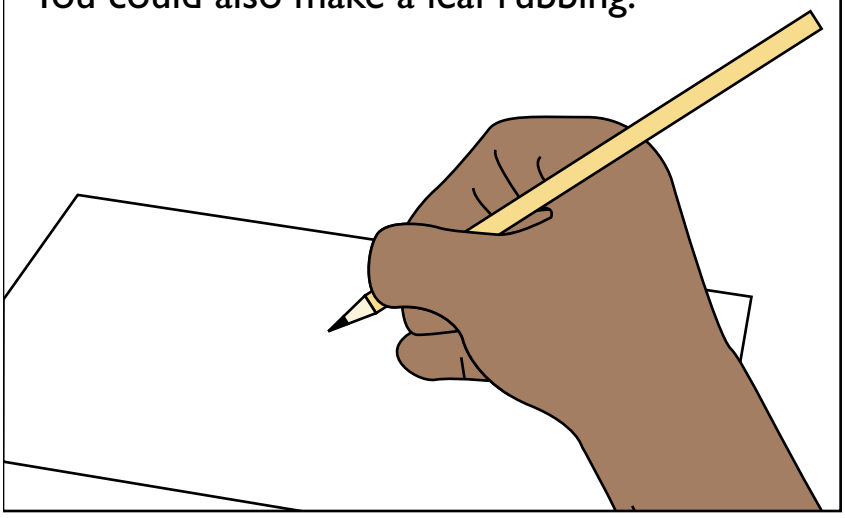
Look at the pages of pressed fall leaves.

What fall colors can you find in the leaves?

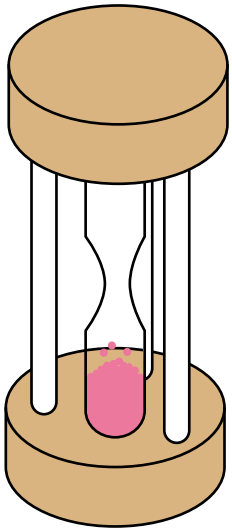


Use the colored pencils to draw one of the leaves in your Lab Notebook and color it in.

You could also make a leaf rubbing.



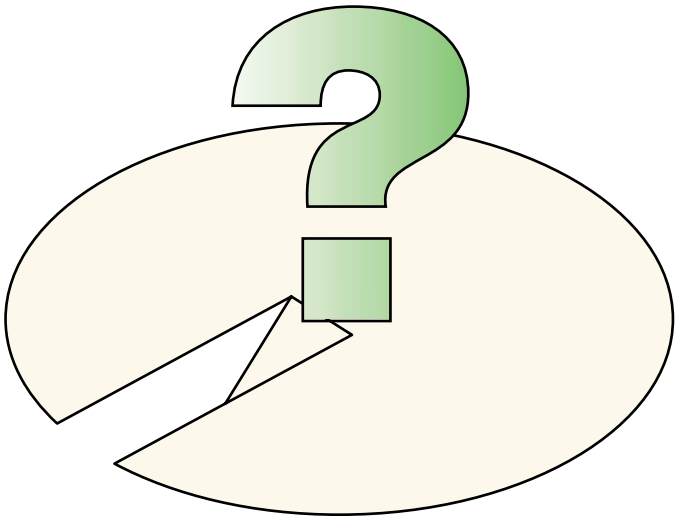
Wait until the timer is done before you turn to the next page.



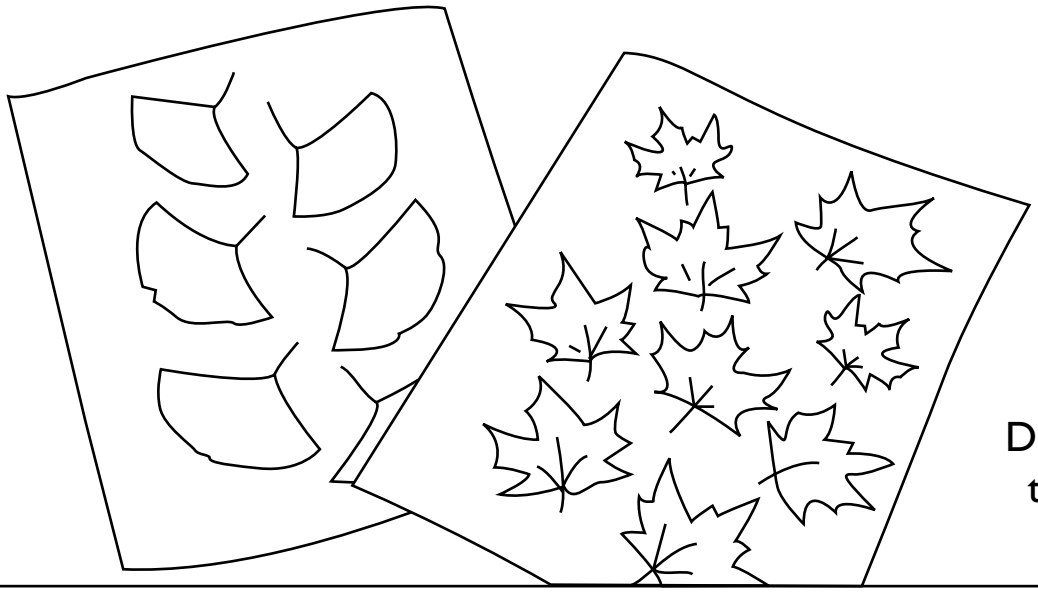
It is OK to wait longer.

When the timer runs out, look at your experiment.

What color molecules have separated from the green molecules?



This color is in leaves all year, but is hidden by the green molecules until the fall.



Did you find this color in the pressed fall leaves?

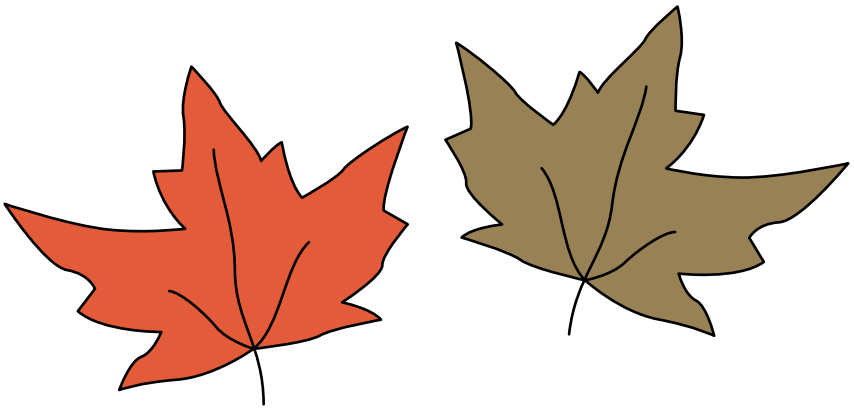
How does the yellow appear in fall leaves?

In the fall, plants lose their green molecules in preparation for winter.

As the green molecules disappear, the yellow molecules that were hidden show through.

What about the other colors in fall leaves?

The other colors in fall leaves, like red and brown, are not in leaves before the fall.



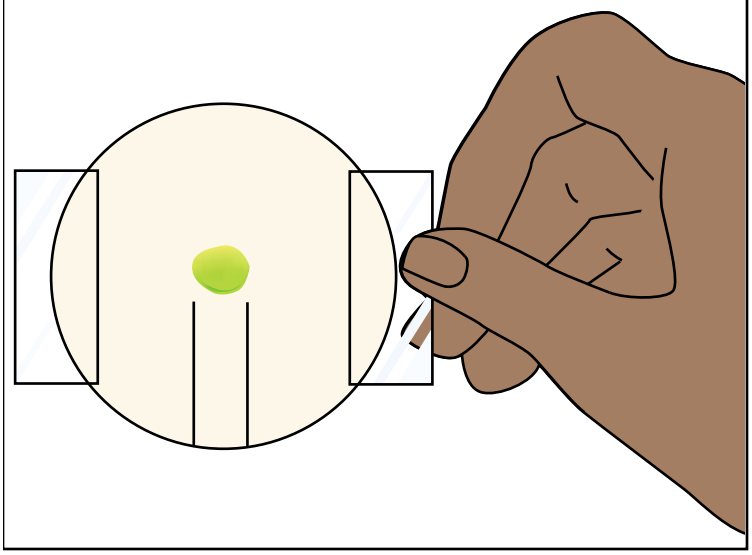
These colored molecules are made in the fall as leaves break apart sugar molecules in preparation for winter.

Do you have a question about this activity or about molecules and leaves?

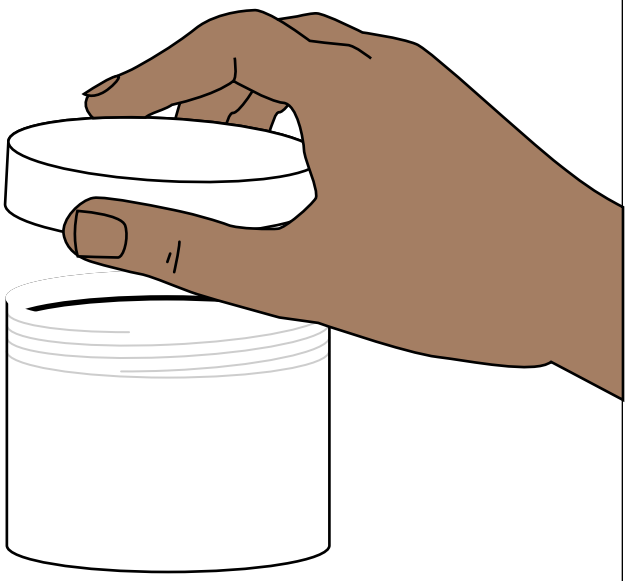
Maybe you can find the answer by experimenting some more.

Ask a staff person if you need help.

When you are done, tape your filter paper in your Lab Notebook, or throw it in the trash.



Screw the lid back on the jar of alcohol.



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