

The logo features the word 'STEM' in large, bold, colorful letters (S in red, T in yellow, E in blue, M in green) each inside a square of the same color. Below it, 'starts now' is written in a purple cursive font. The background is white with scattered colorful icons representing science and technology: a microscope, a beaker, a lightbulb, a rocket, a laptop, a gear, a satellite, a magnifying glass, a bar graph, a DNA helix, a planet, a compass, a pencil, a ruler, a triangle, a square, a circle, and a gear.

STEM starts now

Leaf Chromatography

Recommended Age: 42-47 Months

STEM concepts: Science (physical science), Technology (simple tools), Engineering (engineering), Math (shapes and spatial relationships)

Materials: Glasses or Jars (one for each leaf color), mortar and pestle or a spoon, isopropyl alcohol (rubbing alcohol), white coffee filters, leaves, larger glass bowls, boiling water

What to do: First sort your leaves by color. Select the best leaf. Crush the leaf using a mortar and pestle or glass and spoon. Put it into its own glass and wipe clean, do this for each leaf you plan to process. Tape a leaf of that type and color to each glass for easy remembering. Carefully pour a couple of tablespoons of rubbing alcohol into each glass until the crushed leaf bits are covered. Place the glasses into glass bowls and pour boiling water around (not in!) the glasses to warm up the alcohol. Warming the alcohol speeds up the process. If you don't want to do it that way. Cover the glasses with plastic wrap and leave sit over night instead of using boiling water. After about 30 minutes you should see that the leaves' pigments had colored the alcohol. Cut 1 inch by 5 inch strips from white coffee filters to use as your chromatography paper. Demonstrate placing one strip in each glass by draping over the edge of the glass with a small bit dipped into the alcohol. After an hour or two check your coffee filter strips. Observe what happened.

Language and Communication: Sharing any part of the science behind this will be great vocabulary building and information. They may not understand the process or exactly what you are saying but it is a good way to have them start forming curiosity into reasoning. To absorb the light to make food for the plant, leaves use brightly colored pigments (this is a fancy term for the shade of the color) with chlorophyll (the fancy name for colored pigment) being the most important one. Chlorophyll A, is bluish-green, and chlorophyll B is yellowish-green. During most of the growing season (talk about spring and summer being a growing season), leaves contain more chlorophyll than any other pigment making them appear green. When chlorophyll begins to break down (in the fall) the other pigments start to reveal themselves. This experiments brings out all of the colors that make up that leaf.

Expand the Activity: Try petals or leaves from flower plants instead of trees. Do you see differences?