Activities

5 Quick Science Experiments

Grades 3-5

Overview
Recipes, directions and companion readings for art-related science activities: making bubbles; identifying different colors in the ink of a magic marker; making leaf prints; using simple chemistry to reveal mystery sketches; and how to make tempera, oil-based and acrylic paint from everyday household items.

**Bubbly Art**

What it teaches: Surface tension, visible light spectrum, patterns

What you need: Canning jar, tempera paint, empty two-liter bottle, dishwashing liquid, glycerin, baking dish, white construction paper, straws

What to do: Make a bubble solution of one cup dishwashing liquid and four tablespoons of glycerin in the soda bottle. Fill bottle to just below the top with water. Cap the bottle and shake vigorously. Allow to sit overnight for best results. Combine ¼ cup tempera paint with ½ cup bubble solution in the canning jar. Shake until well mixed. Pour half an inch of the mixture into a flat baking dish. Have students take turns
placing one end of the straw in the bubble solution and gently blowing bubbles directly in the dish. Carefully lower a sheet of paper onto the bubbles, allowing them to pop on the paper. Lift the paper carefully, then observe the shape of the bubble prints and look for patterns.

What just happened? Bubbles are round due to surface tension. Surface tension within a bubble’s skin allows it to pull as tightly and easily as it can without breaking. This shape is always spherical because it is the shape with the least amount of surface area.

Book to read: Make it Pop!, by Joyce Raimondo

**Color Marks**

What it teaches: Chromatography

What you need: Variety of non-permanent markers (washable, overhead, dry erase), 2”-wide paper-towel strips, plastic cups, water

What to do: Discuss how some colors are made by combining two or more colors. Give pairs of students five markers that are secondary or tertiary colors (such as orange, green, or purple), five plastic cups, and five paper-towel strips. Label each cup with the name of a color and fill with an inch of tap water. Draw a band of color two inches from the bottom of each paper strip, then dip into the water to steep. Ask students to predict what colors they will see on the paper after 10 minutes and after 15 minutes. Remove the paper strips from the water and hang to dry, allowing the colors to continue to bleed. Mount the paper strips onto colored construction paper.

What just happened? Chromatography demonstrates that secondary and tertiary colors are a combination of other colors. The paper towels are porous, and water will move toward the top due to a
process called capillary action. As the water creeps upward, the line of color begins to bleed and students are able to see each color component that is used in that marker’s pigment.

**Book to read:** My Many Colored Days, by Dr. Seuss

---

*Nature Prints*

**What it teaches:** Structure of leaves, photosynthesis

**What you need:** Leaves from various trees and plants, construction paper, tempera paint, sponge brushes, full two-liter bottles, newspaper

**What to do:** Invite students to arrange the leaves on the paper in a creative design. Then have children lightly paint the vein side of each leaf and place it paint side down. Cover the paper and leaves with three sheets of newspaper. Have students carefully place a two-liter bottle on top and roll the bottle back and forth five times. Remove the newspaper one sheet at a time. Then peel back each leaf. The internal vein structure will be revealed for each leaf.

Extra credit: Have students repeat the experiment using fresh (not dry) leaves. Skip the painting step and proceed with the rolling. This will result in a chlorophyll print of the leaf structure.

**What just happened?** An entire leaf is called a blade. Within the blade there is a central vein, called the midrib, that brings water and nutrients to all areas of the leaf. Smaller veins extend off the midrib. All of these structures work together to move food, water, and nutrients throughout the blade. While a leaf is green, the blade is filled with a substance called chlorophyll, which is necessary for photosynthesis. When leaves are not green, there is an absence of chlorophyll.

**Book to read:** How Leaves Change, by Sylvia A. Johnson
**Mystery Sketches**

What it teaches: Acid-base reactions

What you need: Baking soda, water, cotton swabs, white paper, grape juice concentrate, plastic cups

What to do: Mix a solution of 60ml baking soda and 60ml water. Invite students to paint a “mystery picture” on a piece of paper, using cotton swabs dipped in the solution. Let them dry. Then have students exchange papers, and give each a cup of grape juice concentrate and a clean cotton swab. Instruct students to brush the juice onto their papers from top to bottom, without changing direction. The mystery image will be revealed.

What just happened? The grape juice concentrate is an acid. Baking soda is a base. When the grape juice concentrate mixes with the baking soda, a chemical reaction occurs and the image appears as a bluish design.

Book to read: Invisible Ink, by Terry Griggs

**Paint Potions**

What it teaches: Emulsions, colloids, suspension

What you need: Egg yolks, water, baby oil, gel glue, dry paint pigment, craft sticks, disposable cups, measuring cups
What to do: Invite students to create three different kinds of paint using the same color. To create a tempera-based paint: Have students mix one yolk and one teaspoon of water (the “vehicle”). In another cup, mix dry pigment and a teaspoon of water into a paste. Mix the vehicle and the pigment paste together to create the paint. To create an oil-based paint: Mix equal parts baby oil and dry pigment. To create an acrylic-based paint: Mix equal parts water and gel glue, and add dry pigment until the color is produced. Discuss the differences between them—specifically, the paints’ opaqueness, intensity of color, density, and texture. Discuss the chemical composition of the paints using words such as colloid, emulsion, mixture, and suspension.

What just happened? Paint consists of a color agent called pigment suspended in a liquid called a vehicle. The pigment floats in the vehicle, making it a colloid.

Book to read: Masterpieces Up Close, by Claire d’Harcourt