



DIY Paper

Let's make paper! Learn how the invention of paper in China revolutionized the world and create your own eco-friendly recycled paper—no fancy blenders or screens needed.

TEKS:

SCI 4.5 B: The student is expected to compare and contrast a variety of mixtures, including solutions.

SCI 5.5 B: The student is expected to demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand and sand and water.

SCI 5.5 C: The student is expected to identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water.

Materials:

- Aluminum foil
- Baking pan (9x13 or similar)
- Bowl
- Cornstarch
- Measuring cup
- Measuring spoon
- Paper towels
- Ruler
- Scrap paper
- Spoon
- Toothpick or push pin
- Water

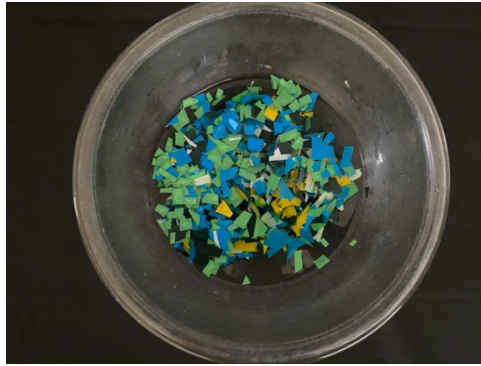
How To:

1. Tear your scrap paper into ¼-inch pieces or smaller. Make sure you have at least one cup of paper pieces.
2. Place these paper pieces into a mixing bowl and cover with hot tap water (approximately two cups).

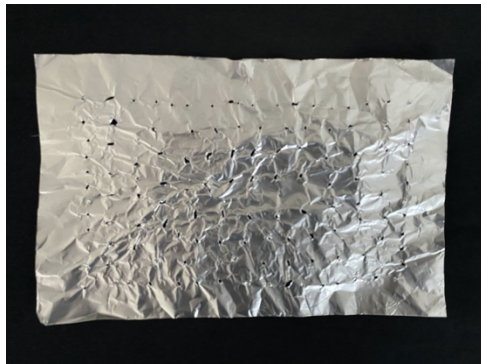
EXPLORE the WORLD of **STEM** from your HOME

www.STEMatHome.org | [#STEMatHome](https://twitter.com/STEMatHome) | © 2020 by Girlstart www.girlstart.org

STEM at Home is a trademark of Girlstart



3. Stir together with a spoon to make sure all of the paper pieces are covered and let them sit for 2-24 hours.
4. While the paper is soaking, prepare your aluminum foil "screen."
 - a. Tear off a piece of aluminum foil that is approximately twice the size of your baking pan.
 - b. Fold the piece of aluminum foil in half.
 - c. Trim the edges of the aluminum foil so that it fits into your baking pan with a one-inch border on all sides.
 - d. Use a toothpick to poke holes all over the piece of aluminum foil, at least one hole per square inch.



5. This next part is messy: Once your paper pieces are very soft, use your hands to break up the pieces even more. By the end of this step, the paper scraps should be very mushy. Your paper and water mixture is now considered a pulp.



6. Add two tablespoons of cornstarch to your pulp and use a spoon to mix together.
7. Pour the pulp + cornstarch mixture over the foil screen and into your baking pan. Add enough water so that your pan is approximately half full of pulp.

EXPLORE the WORLD of **STEM** from your HOME

www.STEMatHome.org | [#STEMatHome](https://twitter.com/STEMatHome) | © 2020 by Girlstart www.girlstart.org

STEM at Home is a trademark of Girlstart

8. Gently drag the foil screen back and forth so that the pulp covers the foil in an even layer.
9. Pull the foil screen up out of the baking dish, ensuring a layer of pulp remains on top of the screen. Hold the foil screen over the dish and let as much water as possible drain out of the pulp.
10. Place the foil screen onto a layer of paper towels and, if needed, use your hands to spread out the pulp more evenly.



11. Use additional paper towels to blot dry, and set the pulp in a sunny area, indoors or outdoors, to fully dry. When it's completely dry, peel your new recycled paper off of the foil screen!



STEM Explanation:

Before the invention of paper, ancient cultures relied on expensive silk, cumbersome bamboo, and heavy stone tablets to keep records. When the papermaking process was invented in China in the year 105 C.E., the world changed! Access to paper allowed people to read more books, conveniently package products, send letters, and make screens, sheets, curtains, clothes, and even money! The first paper in China was made from the bark of the mulberry plant. As the invention spread around the world, people began to make paper from cotton, linen, flax, seaweed, and more!

What is something that everyone used in the production of paper? Fiber! Take a close look at the edge of a torn scrap of paper. Do you see any little hairy-looking pieces? Those are called fibers. You extracted these fibers from scrap paper by soaking them in water and mashing them into a pulp. Ancient paper was made in a similar way! Various materials (like cotton, linen, flax, seaweed, etc.) were broken down into their individual fibers, soaked in water, arranged in a thin layer, and dried. At first, water bonds with the pulp fibers. As the water evaporates, bonds form *between* the fibers instead, resulting in a strong piece of paper.

EXPLORE the WORLD of **STEM** from your HOME

www.STEMatHome.org | [#STEMatHome](https://twitter.com/STEMatHome) | © 2020 by Girlstart www.girlstart.org

STEM at Home is a trademark of Girlstart

Guess what? We make paper the same way today! We've refined the process and can now make paper on a very large scale, but fibers from wood and recycled paper are still the primary "ingredients" for the paper we use in all types of products!

Career Connection:

Chemists study the properties of matter. They may specialize in a specific area of chemistry such as organic chemistry or physical chemistry. These scientists must understand the structure, properties, and compositions of various substances. They study the dynamics of systems and processes at a molecular level.

Resources:

<https://www.ancient.eu/article/1120/paper-in-ancient-china/>

<https://happydealthappyday.com/homemade-paper/>

EXPLORE the WORLD of **STEM** from your HOME

www.STEMatHome.org | [#STEMatHome](https://twitter.com/STEMatHome) | © 2020 by Girlstart www.girlstart.org

STEM at Home is a trademark of Girlstart