



Make Your Own Plastic



Plastic is all around us. Take a look around you and make a list of all the things that are made of or contain plastic. Water bottles, toys, dishes, and even computers have plastic in them.

The first manmade plastic was created by a British inventor named Alexander Parkes. In 1862, he introduced plastic—which he called Parkesine—to the public at the Great International Exhibition in London, England. He believed that plastic could do everything rubber could, but at a lower cost. It could be molded, shaped, or cut. Parkes made the substance from an organic material called cellulose.

Today, many manufacturers use plastic in their products because it is light weight and durable and can be made into almost any shape. It also can be used in place of natural materials, like wood or ivory, which can help conserve those resources. But plastics also require natural resources since they are usually made from petroleum or oil byproducts. Plastic also takes a long time to biodegrade so it can be harmful to the environment if it is not disposed of properly. While many people recycle plastic, in 2008, about 17% of the trash in landfills was plastic.

There are scientists and inventors working today to come up with more environmentally friendly plastic called bioplastic. Bioplastics can be made from materials like vegetable oil and corn starch. These plastics are biodegradable and are being used for things like disposable dishes, food packaging, and trash bags.

Make Your Own Bioplastic

You can make your own bioplastic with ingredients and supplies you have in your kitchen!

Here's what you'll need:

- Milk
- Vinegar
- Measuring cup
- Measuring spoons
- Small pot or sauce pan
- Spoon for stirring
- Strainer or colander
- Large bowl
- Paper towels
- Aluminum foil or wax paper
- An adult to supervise



Supplies for making plastic

Optional supplies:

- Clay, candy, or soap molds
- Cookie cutters
- Food coloring



1. Gather all the supplies you will need to make plastic. Be sure you have an adult with you before you begin your experiment.
2. Measure a cup of milk and pour it into the pot or sauce pan.
3. Place the pot on the stove and turn it on to medium heat.
4. Stir the milk with the spoon as it heats. If you want to add food coloring, add a few drops now.
5. Continue to heat and stir the milk until you see a light foam form on the top of the milk. Turn off the stove.
6. Measure one tablespoon of vinegar. Pour it into the heated milk.
7. You will see the milk start to form clumps. Stir the milk and vinegar mixture for about a minute.
8. Hold the strainer or colander over the large bowl. Have an adult pour the milk mixture over the strainer. The solid clumps will stay in the strainer, while the milk will drain into the bowl.
9. Gently shake the colander. The clumps should come together to form a single mass. This is your plastic!



Milk starts to form clumps when vinegar is added

10. Pour the plastic out onto a piece of foil or wax paper.
11. Use paper towels to soak up some of the liquid. Blot two or three times, but be sure not to sop up all the liquid or your plastic will be too brittle.



Plastic waiting to dry

Get Creative!



Now you can shape or mold the plastic however you like. You can cut a shape with a cookie cutter or by hand. You can also put the plastic into a clay, candy, or soap mold. Once you have the plastic in a shape you like, let it dry. (If you use a mold, leave the plastic in the mold.) It takes 1-2 days for the plastic to dry completely. After it dries, your plastic will be flexible and a little squishy. You can leave it as is, paint it, or do something else really creative!



*Two plastic frogs made using a candy mold. The green frog was made with food coloring. We put magnets on the back of the frogs and created something useful **and** fun from the milk-and-vinegar plastic!*

Whatever shape your plastic takes, be sure to take a photo of it and ask an adult to send it to Sparky at sparklab@si.edu!

Wanna Learn (and Do) More? Check Out the Following Links!

- http://www.americanchemistry.com/s_plastics/Polymers/
- <http://www.chemheritage.org/EducationalServices/FACES/poly/home.htm>
- <http://www.epa.gov/epawaste/education/kids/planetprotectors/index.htm>