

# From Corn to Plastic

**Grade:** Seventh Grade

**Standards:** Science: Understands scientific inquiry through data collection, displaying and analyzing results, and making inferences and conclusions. Interprets environmental factors that impact the ecosystem.

**Objectives:** Understand the environmental reason for using corn as a source for the production of plastics.

Follow the step-by-step procedures in making plastics from corn.

Observe and record data from an experiment.

**Materials Needed:** “Making Biodegradable Plastic” worksheet  
2 cups of cornstarch  
¼ cup of corn oil  
2 cups of water (approximately)  
Plastic resealable bags (1 per student)  
2 packages of food coloring (4 bottles/package)  
Tablespoon measures  
Medicine droppers  
Microwave

**Do:** Begin with a discussion on plastics.

Over the past several years, many new products have been developed from corn. Here are a few examples:

Cornstarch packaging material: Packing peanuts are made with over 95 percent cornstarch. They are used as loose fill inboxes to protect contents. The cornstarch packing peanuts are lightweight, shock absorbing, totally biodegradable, do not attract rodents and contain no oil. The packing peanuts are made from a renewable resource (corn) and are reusable.

Golf tees: Tees are made from cornstarch with biodegradable additives and small amounts of inorganic minerals. Golf tees made from corn are lightweight, paint free, stronger, reusable and totally biodegradable. Their usage can replace wooden tees, which helps our environment since trees can take 30 years to grow

while corn grows each year. Golf tees made from cornstarch decompose into water, carbon dioxide and biomass, so golf courses are littered less than with traditional wooden or plastic tees.

Ethanol: Ethanol is a high performance fuel made from corn that is safe for our environment. It burns cleaner and pollutes less than petroleum fuels. Since ethanol is made from a renewable resource (corn), it can be replenished. Using ethanol saves nonrenewable petroleum and reduces our dependence on oil from other countries.

Plastics: Most plastics are made from oil products, a nonrenewable resource. Plastics do not break down or biodegrade. Because of this, plastics last for thousands of years and take up a lot of room in landfills. Landfills are filling up. Many experts feel the landfills in the United States will reach maximum capacity in the next 20 years. One solution to this problem is plastics made from corn products such as cornstarch. Plastics made from corn will break down. Plus, corn is a renewable resource, unlike oil. Plastics from corn will help reduce space needed for landfills.

Discuss with students how researchers have found away to make a biodegradable plastic from corn.

Using their worksheet, have each student make their own biodegradable plastic.

1. Place a tablespoon of cornstarch in a plastic resealable bag.
2. Add two drops of corn oil to the cornstarch
3. Add one and one-half tablespoons of water to the corn oil and cornstarch.
4. Add two drops of your favorite food coloring to the mixture. Seal the bag and knead well to a uniform consistency.

**Reflect:** Have students complete the questions on their worksheet.

**Apply:** Why is it necessary to find other forms of materials instead of depending on oil?

What could you make out of the plastic if you let it harden?

What are other items made from corn? (*cornstarch packaging material, golf tees, ethanol*) Research additional methods or products.

Expose your biodegradable plastic to sunlight and air. Compare daily observations to traditional plastic.

Bury plastic and biodegradable plastic in the soil. Observe each week and record results.

*To be used with:*  
From Corn to Plastic

Name: \_\_\_\_\_

## Making Biodegradable Plastic

Follow the recipe to make your own biodegradable plastic from corn and answer the questions below:

### Directions:

1. Place a tablespoon of cornstarch in a plastic resealable bag.
2. Add two drops of corn oil to the cornstarch.
3. Add one and one-half tablespoons of water to the corn oil and cornstarch.
4. Add two drops of your favorite food coloring to the mixture.
5. Seal the bag and knead well to a uniform consistency.

### Discussion Questions:

1. What did you notice about your biodegradable plastic?
2. Is your biodegradable plastic the same as the other students? How is it different?
3. What could you make with the biodegradable plastic if you let it harden? (Remember, it will eventually dissolve.)

*Heat the plastic in a microwave for 20-25 seconds on high power.*

1. What happens to your plastic now?
2. Form your plastic into a ball and describe what it will do.
3. Name three things that could be made from plastic in the future.

