



SOYBEAN PLASTIC

Grade Level

3-7

Length of Lesson

50 minutes

Objective

By the end of this lesson, students will have a better understanding of how plastic can be made from renewable resources.

Materials Needed

- Cornstarch
- Soybean oil
- Food coloring
- Water
- Resealable sandwich-sized bags
- Microwave
- Pipette or eye dropper
- Tablespoon measuring spoons
- 1/8 teaspoon measuring spoon

Standards

Common Core

CCSS.ELA-

Literacy.RI.4.3; RI.5.3

NGSS

5-PS1; MS-PS1

Lesson Summary

This lesson is a fun, hands-on activity designed to help students understand how agriculture and the biological materials produced on farms can be used for more than just food. This lesson is also perfect for introducing renewable and non-renewable resources!

Lesson adapted from [National Ag in the Classroom](#).

Suggested Sequence of Events:

1. Set Up: Complete this as a demonstration, group activity, or individual activity depending on time and materials.
2. Read through the AITC Soybean Ag Mag to learn more about soybeans! Interactive online versions can be found on our website.
3. Complete the activity following the procedures:
 - Read *Full of Beans: Henry Ford Grows a Car* by Pegge Thomas aloud. Suggested pre-activity questions can be found on the teacher resources page.
 - Introduce the term “bioplastic” by breaking the word into two parts; “bio” and “plastic.”
 - Put students into groups of three to four and give each group a set of materials.
 - Place one (1) tablespoon of cornstarch, 1/8 teaspoon of soybean oil, and one (1) tablespoon of water into the baggie.
 - Close the baggie and knead the materials together.
 - Open the baggie and add two drops of food coloring. Then close the baggie and mix again.
 - Open the baggie a little to create a vent and then heat it in the microwave for 20-25 seconds.
 - Remove the baggie and let it cool. Be careful, the baggie and contents will be hot!
 - Once it’s cooled, take it out of the baggie and you now have soybean plastic!
4. Whole class discussion and reflection of activity. Ask how plastic and bioplastic affect the environment. How does bioplastic affect farmers? What objects could be made using bioplastics? Would Henry Ford’s soybean plastic car work in today’s world?

TEACHER RESOURCES

Pre-Activity Questions:

What is plastic made from? (Many plastics are petroleum-based.)

How did the Great Depression affect Henry Ford and soybeans?

How did WWII affect the soybean plastic car?

What other events had an impact on Henry Ford's life and/or career?

How could soybean plastic be used today?

Why is soybean plastic considered biodegradable?

Extension Ideas:

- Show students a diagram of a soybean plant.
- Complete our "Beanie Baby" activity to learn about germination and watch soybeans grow.
- Watch [Farm to Car](#) and the TEDx Talk [Sitting On Soybeans](#) to learn about how the Ford Motor Company uses bio-based products to create materials for cars. What are bio-based materials? Talk about the benefits of using bio-based materials.
- Take the experiment to the next level and have students test different amounts of the ingredients to see if that changes the product. Use our scientific inquiry worksheet to guide students.
- For higher grade levels, have students weigh the materials on a scale before and after microwaving.
- Take a field trip to a soybean farm and learn about soybean farming.
- Invite a soybean farmer into the classroom.
- Complete our "Corn Plastic" activity and compare the two types of plastics.
- Compare and contrast renewable and non-renewable resources.
- Go to agintheclassroom.org to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!