



Explorations in Agriculture

CORN BIOPLASTICS

PURPOSE

Hands-on exploration of bioplastics made from corn and discussion of agriculture's renewable resources.

TARGETED GRADE LEVEL

3rd-5th grade

MATERIALS

- Sandwich-size resealable bags, 1 per group
- Cornstarch, 1 tablespoon per group
- Corn oil, 2 drops per group
- Food coloring, 2 drops per group
- Tablespoons, 1 per group
- Instruction sheet



ACTIVITY

1. Divide the class into groups of 4-5 students. Give each group cornstarch, corn oil, water, and food coloring.
2. To make the bioplastic, have the students combine 1 tablespoon of cornstarch, 2 drops of corn oil, 1 tablespoon of water, and 2 drops of food coloring in a resealable sandwich-size bag.
3. Instruct students to seal the bag and mix the ingredients by rubbing the outside of the bag with their fingers until the ingredients are thoroughly combined.
4. Open the bag slightly, making sure it can vent, and place it into a microwave oven on high for 20-25 seconds.
5. Carefully remove the bag from the microwave, and let it cool for a few minutes. While it is still warm, allow the students to form their plastic into a ball.
6. Discuss the benefits and drawbacks of this renewable bioplastic.

CLASSROOM CONNECTIONS

Science

Compare physical and chemical changes and determine the change that occurs in making bio-plastic.

Continued



ACADEMIC STANDARDS

Minnesota Science Standards and Benchmarks

4.2.1.2.2 Describe how the states of matter change as a result of heating and cooling.

5.3.4.1.1 Identify renewable and non-renewable energy and material resources that are found in Minnesota and describe how they are used.

National Agricultural Literacy Outcomes

T2.3-5.b Distinguish between renewable and non-renewable resources used in the production of food, feed, fuel, fiber and shelter

ADDITIONAL RESOURCES

Corn Commodity Page for kids at <http://mnagmag.org/commodities/>

Concept and content for this Agventure is adapted from California Agriculture in the Classroom

MAKING BIOPLASTIC



MATERIALS:

- | | |
|-------------------------|-----------------------|
| 1 tablespoon cornstarch | 2 drops food coloring |
| 1 tablespoon water | 1 measuring spoon |
| 2 drops corn oil | Ziploc bag |

PROCEDURE: Part 1

1. Measure 15 ml (1 tablespoon) of cornstarch into your plastic bag.
2. Add 15 ml (1 tablespoon) of water to the cornstarch.
3. Add 2 small drops of corn oil to the mixture in your bag.
4. Add 2 drops of food coloring to the mixture in your bag.
5. Seal the bag, and squish it gently to mix everything together.

Describe the mixture in your plastic bag: _____

How does it feel when you slowly squish the bag? _____

Does it feel the same when you squeeze the bag quicker/harder? _____

Is your mixture a solid or a liquid? _____

PROCEDURE: Part 2

6. Microwave your mixture on high power for 20 seconds. Be sure to leave the bag open a tiny bit so that steam can escape. Be careful, the plastic will be hot!
7. Let it cool for several minutes. While it is cooling answer the questions below.
What does your new substance look like? How is it different from the mixture you started with?

If your plastic is cool, knead it with your hands. What does it feel like? Describe its other properties.

What could you make with your bioplastic? What couldn't you make? Why?

What is used to make bioplastic? _____
