

# Food and Fiber Products

**Grade Level: 4**

**Approximate Length of Activity: 40 minutes**

## Objectives

### Teacher

1. Help students understand the concept of recycling and biodegradable materials.
2. Show examples of “environmental friendly” food and fiber products.
3. Help students with experiments.

### Students

1. Understand why we recycle and the practices/product agriculture produces and uses to protect the environment.
2. Understand the types of food and fiber products we consider to be “environmentally friendly.”

**Michigan Content Standards: (Science) S.I.P.E.1:** S.IP.04.11; S.IP.04.12; S.IP.04.13; **S.IA.E.1:** S.IA.04.11; S.IA.04.12; S.IA.04.13; S.IA.04.15; **S.RS.E.1:** S.RS.04.11; S.RS.04.15; S.RS.04.16; S.RS.04.17; S.RS.04.18; S.RS.04.19

## Introduction

We need to preserve our resources. One of the most important resources is water. Most of our planet is covered with water. Water found in freshwater lakes and rivers is an important drinking source for people and animals.

Our water resources:

- The oceans -- 97.2%
- Glaciers/ice caps -- 2.0%
- Groundwater -- .62%
- Freshwater lakes -- .009% (like the bay)
- Saltwater lakes -- .008%
- Atmosphere -- .001% (rain/humidity)
- All rivers -- .0001%

The best way to help preserve water is to stop pollution. Agriculture based products will help us do this because they breakdown in the environment.

## Materials Needed

- Paper towel sheets (student clean up)
- Styrofoam peanuts
- Corn peanuts
- Newspaper
- 1 plastic teaspoon
- Newspaper to cover desks
- 1 trash bag for clean-up
- 1 plastic teaspoon
- Lab sheets
- Stir sticks (rubber band and reuse)
- 1 milk jug – cut down to collect waste
- 1 bottle blue food coloring
- Corn kernels (3 per student)
- Corn starch
- Assorted items made from corn (golf tees, pop, candy corn, cornmeal, etc.)
- Samples from industrial or alternative products from commodities – golf tees, soy stone, wool, etc.

## Activity Outline

1. Discover how we use corn everyday in various products.
2. Conduct observations on cornstarch.
3. Conduct experiment comparing degradability of packing material.

## Corn Activity

Have students cover desks with newspaper. Pass out kernels of corn to all students and ask the following questions:

- What is this?
- Why is it important?
- How is it used in our daily lives?

As they brainstorm answers – list ideas on the board. Pull an item from the kit if answers slow down. As the list is completed, pull items from kit and match or add to list – be sure to tell how corn is in each product (after they guess). Note – product list is not attached.

## Cornstarch Activity

Look at cornstarch from bag. Pass out a teaspoon of cornstarch to each student (place on towel or newspaper). Let them smell, taste and touch cornstarch. Ask the following questions:

- What does it feel like?
- What does it taste like?
- What does it smell like?

Explain: Cornstarch is a versatile corn product because it can be made into different

“biodegradable” products. Biodegradable materials are natural. They break down and return to the soil. This is recycling.

Many years ago when the glaciers receded; they left the clear fresh water that makes up our Great Lakes as well as the many inland lakes that are found in Michigan. Because these are an important source of fresh water as well as a tourist attraction – it is very important that we protect the lakes from pollution. Ag-based products will help us to do this.

## Degradability Experiment

Divide students into groups of three. Pass out three cups per group of students, two pieces of Styrofoam; corn based packing peanuts, shredded newspaper, three stir sticks and one lab sheet. Fill all three cups with an equal amount of water and show how glasses of water have an equal amount of water.

Explain: To help you understand that ag based products are different; we’re going to do an experiment. In your groups, you will be comparing Styrofoam packing peanuts; corn based packing peanuts and shredded newspaper.

All of these products are used to ship items from one place to another. You will be adding these materials to water and observing what happens. This will show what might happen if these materials were accidentally dumped in the bay.

Using your lab sheet, write predictions of what you think will happen to each material. When I say start, add the materials to your water and stir until I say stop. Ok, do the experiment now!

Make observations after 1 ½ minutes and again at 3 minutes. Have students write observations down while waste materials are collected. Then ask these questions:

- What happened to the Styrofoam?
- What happened to the cornstarch pellets?
- What happened to the newspaper?
- Did stirring help?
- Which products are ag-based? (Corn and paper are ag based.)
- What would happen if we left these products in water for several weeks? (Newspaper would dissolve, Styrofoam would not change.)

Have groups report back to the class with one sentence about what happened. Discuss results and tie it to the discovery of corn’s many uses – show industrial products made from corn. Talk about other “environmentally friendly” food and fiber products and show examples (see products in kits and commodity list).

Explain: Farmers are careful to be good to the environment. We need to preserve our resources. One of the most important resources is water. Most of our planet is covered with water. Water found in freshwater lakes and rivers is an important drinking source for people and animals. Let me show you how limited our water supply really is.

## Limited Water Demonstration

Show one gallon of water. Pour out ¼ cup of water into plastic cup (marked on cup). Take two drops of water from ¼ cup and put in a student volunteer’s hand.

Explain: This gallon of water represents all the water on earth. This ¼ cup of water represents glaciers, ice caps and all the freshwater in the world.

Could I have a student volunteer to hold out their hand to demonstrate just how little of the worlds water is available for us to use?

These 2 drops of water represent all the water in freshwater lakes and rivers that are available for people and animals to use.

## Conclusion

Explain: Water is an important resource and making biodegradable products from agriculture keeps the water clean. Review: Food and fiber products are friendly to the environment. They can be recycled to create useful products and they keep the land and water clean.

## Discussion Questions

1. Why do we recycle?
2. How do we recycle?
3. What would happen if we didn't recycle?
4. Why is water so important?

## Related Activities

1. Have students determine other ways to preserve water and keep it clean.
2. Have students fill out a journal of the food they eat and items they use and how those items came from agriculture.
3. The lesson "From Corn to Plastic" located in the science section of this curriculum guide.
4. The lesson "Corn: An A-mazing Plant" located in the social studies section of this curriculum guide.
5. The lesson "Most 'Bean' ificial" located in the social studies section of this curriculum guide.
6. The lesson "A Bean Named Soy" located in the science section of this curriculum guide.

# Lab Sheet for Experiment

I. Observation about dry materials

Material A:

Material B:

Material C:

II. Prediction of what will happen:

A. \_\_\_\_\_

B. \_\_\_\_\_

C. \_\_\_\_\_

III. Observations about materials after stirring (1½ min.):

A. \_\_\_\_\_

B. \_\_\_\_\_

C. \_\_\_\_\_

IV. Conclusion (one sentence please.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Michigan Grown Commodities

This list is a partial representation of the more than 70 commercial agricultural products grown on Michigan farms. Most crops require well drained soils. Exceptions include blueberries, cranberries, and spearmint. All of which require organic soils and more moisture than other crops.

There is a minimal amount of waste in the processing of crops and livestock for consumption. Livestock is a good example of this. Bones and hooves from animals are used in piano keys, adhesive tape, collagen cold cream, bone china, photographic film and other products. Organs such as intestines are used for sausage casings, instrument strings, and surgical sutures. Unusable parts are composted and become organic matter that can be safely returned to the soil.

## Fruits/Vegetables

snap beans	peppers
potatoes	apricots
sweet corn	pears
asparagus	broccoli
blueberries	strawberries
carrots	cauliflower
cranberries	onions
grapes	squash
apples	cantaloupes
tomatoes	cucumbers
cherries	celery
mushrooms	raspberries
plums	blackberries

## Field Crops

dry beans  
soybeans  
corn  
wheat and grains  
sugar beets  
mint  
hay  
oats  
rye  
barley

## Trees

maple syrup  
Christmas trees  
forestry (paper, lumber, other)

## Poultry/Livestock/Dairy/Fiber

hogs  
sheep/lambs  
beef cattle  
dairy cows  
poultry  
aquaculture (fish)  
mink  
mohair  
wool  
milk and dairy products (butter, ice cream, etc.)  
eggs  
chicken/turkey  
veal calves  
llama  
ostrich

## Nursery/Floriculture

gladioli  
bedding plants  
hanging baskets  
turf  
trees and shrubs  
cut flowers(roses, mums, other)  
dried flowers  
all potted plants(geraniums, poinsettias, other)

# Contacts for Corn-based Products

## Biodegradable Bags

Mich. Biotech Institute (MBI)  
3900 Collins Road  
Lansing, MI 48910  
(517) 336-4628 or  
(517) 336-4673

## Golf Tees

Gary Larrivee  
Terra Form  
P.O. Box 292  
Dalton, MA 01227  
(413) 684-9771

## Packing Peanuts

American Excelsior Association  
70 Cleveland Rd. Norwalk, OH 44857  
(800) 968-4375 ext. 226  
Fax: (419) 663-7169

## Plastic Tableware

American Precision Plastics  
11060 Irma Drive  
Northglenn, CO 80233-3611  
(303) 457-2400

## Windshield Fluid

Tom Meyer  
Acquainis Technologies  
12231 Manchester Road  
St. Louis, MO 63131  
(314) 822-4240

## Hydrosorb

Steve Ayers  
Central Illinois Manufacturing Co.  
201 N. Champaign Street  
Bement, IL 61813  
(217) 678-2231  
(not corn-based)

## Biodegradable Pens

Roatan International  
20 West 38th Street  
New York, NY 10018  
(212) 768-7538

## For additional sources contact

Michigan Corn Growers  
12800 Escanaba Drive, Suite B  
DeWitt, MI 48820  
(517) 668-2676  
[www.micorn.org](http://www.micorn.org)

# Food and Fiber Products are Environmentally Friendly

**Based on 35 students per class**

**Each kit is designed for conducting 2 presentations**

## **Materials Needed**

- 70 paper towel sheets (student clean-up)
- 70 small clear plastic cups (3 per group or 1 per child) – collect and reuse
- 45 pieces Styrofoam peanuts in baggies
- 45 pieces of corn peanuts in baggies
- 45 pieces of newspaper in baggies
- 35 stir sticks (rubber band and reuse)
- 1 milk jug
- 1 milk jug – cut down to collect waste water
- 1 plastic teaspoon
- 70 sheets newspaper to cover desks
- 1 trash bag for clean-up
- 70 lab sheets
- 1 bottle blue food coloring
- corn kernels (3 per student)
- assorted items made from corn (golf tees, pop, candy corn, cornmeal, etc.)
- cornstarch
- samples for industrial or alternative products from commodities – golf tees soystone, wool, etc.