LESSON 8

We Grow Wheat and Eat Tortillas

Grade level: K-4
Subject Areas: Biology, social studies
Duration: 2 class sessions
Setting: Classroom
Season: Any
Conceptual Framework Topics: Importance of agriculture, invasive plant impacts

OBJECTIVES

Students will understand how Montana's primary agricultural crop grows and is made into flour and used in cooking. They will understand that weeds can threaten the production of important crops like wheat.

METHOD

Students observe and journal the process of sprouting a kernel of wheat. They grind wheat and make tortillas from the flour they make.

MATERIALS

- ✎ Stalk of wheat for each student or pair of students (ask a local farmer for some stalks or contact your county extension agent for a source)
- ✎ Jewelry size plastic zip bags, one for each student
- ✎ Yarn for necklaces
- ✎ Journal or notebook (see instructions in ***Lesson 4: Making a kNOweeds Journal*** in this guide)
- ✎ Water crystals (water-absorbing polymers; available through plant and garden supply or craft stores)
- ✎ Food coloring (optional)
- ✎ Wheat grinder or food processor
- ✎ Enough wheat to have 1-½ cups flour for each group of 4 students
- ✎ Recipe and ingredients for tortillas (see end of lesson)
- ✎ Plastic bags
- ✎ Skillet and heat source for cooking tortillas

BACKGROUND

As of 2009, approximately 60 million acres of Montana's 93 million acres are used for farm and ranch production. Most of this land is rangeland used for cattle and sheep, with about 17.5 million acres used for growing crops. The average size of a farm in Montana is 2,120 acres. Additionally, some government land is leased for agricultural purposes. About five percent of the population in Montana are farmers and ranchers, and a total of 17 percent of the population hold agriculture-related jobs.

Agriculture contributes more than $2.4 billion to the state's economy annually. Montana's primary crop is wheat. Other crops grown in Montana include barley, oats, berries, cherries, corn, hay, mint, sugar beets, sunflowers, apples, canola, potatoes, dry beans, field peas, flax, grapes, garlic, lentils, safflowers, mustard,

(Adapted from *Agriculture in Montana Schools* Curriculum)

squash, alfalfa, and many more. Montana wheat is used as livestock feed or made into flour for foods like bread, cakes, cookies, crackers, and pretzels. Our wheat is also used for non-food items such as glue and pharmaceuticals.

In August or September, the farmer combines or harvests the wheat. Next, the wheat is sold to various industries, which make food or feed, or for shipment overseas. The wheat is put through a cleaning process to remove foreign matter (weed seeds, corn seeds, beans, stems). Rollers then press over the wheat kernels to break them into pieces, and they are shaken on screens to sift out the bran (the broken coat of the kernel) and germ (the part of wheat used to grow a new plant) not used in wheat flour. If whole wheat bread is what the mill wants to make, the bran and germ are added back in. (Information from the Agriculture in Montana Schools website: **http://aginmtschools.org/**).

Invasive plants are a major problem for Montana's growers. Invasive plants reduce crop production and are expensive and time-consuming to control. Montana farmers and ranchers spend $100 million each year trying to control invasive plants. For example, farmers and ranchers applied 4,737,000 pounds of chemical herbicides to wheat crops alone in Montana in 2008. Unfortunately, this expensive effort isn't entirely successful, due to the tenacious characteristics of invasive plants.

PROCEDURE

1. Ask your students if they know what Montana's biggest business is in economic terms. Explain that it is agriculture, or farming and ranching. Ask how many different agricultural products (crops and livestock) they can list that are grown in Montana. Explain that wheat is the primary crop grown in Montana.

Give each student a stalk of wheat. Have children break off the stem. Explain that the stem is a straw. Have children take turns rolling the head in their hands. Separate the wheat kernel from the chaff. Estimate how many kernels most heads have. Count the kernels and compare to their estimates. Explain that what the children just did (separating the kernel from the chaff) is the job a combine on the farm does.

2. Make sprouting bags. You can squirt several drops of food coloring into a pint of water. Each child receives one kernel of wheat, 3 or 4 water crystals, 1 small jewelry size plastic zip bag (with hole punched above the seal) and 3 or 4 drops of colored water. Put all items into the bag, zip the bag shut and thread yarn through to make a necklace. The necklace could be worn every day throughout the week. **They should be left at school.** Begin this activity on Monday to be able to journal throughout the week.

3. Use your kNOweeds Journals or other student journal or notebook. Each day of the week observe, discuss, and journal by drawing or writing a few words. By the end of the week the kernel should have roots and a green sprout. Send it home at the end of the week to plant or plant it in a small pot with potting soil in the classroom.

4. While you are sprouting the wheat or after it sprouts, make the tortillas using the recipe at the end of the lesson.

5. Talk about how weeds can threaten the growth of plants, including important plants that provide us with a lot of our food.

6. Make a copy of the tortilla recipe in the tortilla shape for each student and have them cut out the recipe circle to take home.

Extensions

Follow up with lessons on plant competition and weeds in this guide.

Make Tortillas in a Bag

FLOUR TORTILLAS IN A BAG

1-½ cups all-purpose flour

1 teaspoon salt

½ teaspoon baking powder

3 tablespoons shortening

½ cup hot water (125-130°F)

In a large plastic bag combine flour, salt, and baking powder. Close bag and shake to mix.

To the ingredients in the bag, add the shortening. Close bag with twist tie and work mixture with fingers until no large lumps of shortening remain.

Add the hot water to the bag. Close the bag and mix with fingers until the ingredients form soft dough that pulls away from the sides of the bag.

Turn the dough out onto a lightly floured surface. Divide dough into 4 equal pieces and shape into balls. Each child receives two balls. Cover them with the plastic bag, and let rest for 15 minutes.

Roll or pat the dough into 8-inch to 10-inch circles. Place each circle on a griddle or frying pan, heated to medium high. Cook until dark brown spots appear. Turn tortilla and cook on the other side until brown.

Ways to Enjoy:

Roll up a tortilla with cheese, salsa and refried beans.

To make a fun dessert, sprinkle with cinnamon and sugar on top roll up and eat.