

# Bread in a Bag

**Skills:** Math, Science, Social Studies

**Objective:** Students will learn about the origins of wheat and make bread in a bag.

## Background

Bread, in one form or another, has been one of the principal foods for humans from earliest times. Loaves and rolls made and baked over 5,000 years ago have been found in ancient Egyptian tombs, and wheat has been found in pits where human settlements flourished 8,000 years ago. In the Stone Age, people made solid cakes from stone-crushed barley and wheat.

Bread provided ancient people with a reliable food source which would keep through the winter months and multiply in the summer. This allowed them time to develop other useful skills beyond what was required to feed themselves.

A millstone used for grinding grain has been found that is thought to be 7,500 years old. For thousands of years people used stone wheels powered by wind to grind wheat into flour for bread. In the middle of the nineteenth century, a Swiss engineer invented a new type of mill with rollers made of steel which operated one above the other and were driven by steam-engines.

Meanwhile, the North American prairies were found to be ideally suited to grow wheat. This, together with the invention of the roller-milling system, meant that for the first time in history, whiter flour (and therefore bread) could be produced at a price which brought it within the reach of everyone—not just the rich.

Today wheat is Oklahoma's number one crop and is very important to the Oklahoma economy. In 2000 6.1 million acres of winter wheat were planted in Oklahoma, and 4.2 million were harvested, yielding 143 million bushels of wheat. Oklahoma ranks number three in the nation in the production of winter wheat, producing 9 per cent of the total of all winter wheat produced in the US. In 2001, Oklahoma's winter wheat crop was worth \$344 million to the Oklahoma economy. Hard red winter wheat, the kind grown in Oklahoma, is mostly used for making bread.

Enriched white bread has about the same nutrients as whole wheat bread. Both are excellent sources of carbohydrates, fiber, protein, B-vitamins and important trace minerals. Whole wheat bread contains 5.3 percent dietary fiber, while white bread has only 1.6 percent. Scientists tell us that an adequate amount of fiber in our diet may help prevent certain types of cancer. Fiber is found in mainly whole grain breads and cereals and in fresh fruits and vegetables.

## P.A.S.S.

### GRADE 1

**Social Studies**—4.2; 5.1

**Science Process**—1.1;

3.1,2,4

**Physical Science**—1.1,2

**Health**—2.4,6; 6.2

### GRADE 2

**Science Process**—1.1;

3.1,2,4

**Physical Science**—1.1

**Health**—2.4,6; 6.2

### GRADE 3

**Science Process**—1.1;

3.1,2,4

**Physical Science**—1.1

**Health**—2.4,6; 6.2

### GRADE 4

**Social Studies**—5.2

**Science Process**—1.1;

3.1,3,4

**Physical Science**—1.1

**Health**—2.4,6; 6.2

## Materials

Masking tape

Felt-tip pen

White banquet paper for covering tables

Soapy sponges and water for cleaning

Kits containing the following for every two students:

- One 2-gallon heavy-duty plastic bag
- Three sandwich-size plastic bags
- Two 1-ounce plastic soufflé cups
- One 6-ounce plastic cup with lines marked for 1/2 cup and 1/3 cup
- Two 1-pound size aluminum loaf pans
- Teaspoon measuring spoons
- Enough for 20 kits, or 40 students)
- 20 pounds whole wheat flour
- 20 pounds all-purpose flour
- 1 cup active dry yeast
- 1/2 cup salt
- 2 cups honey
- 1 cup salad oil
- 2-4 pitchers of water

Wheat, oats, barley and other grains are grasses, but no one yet has found the wild form of grass from which wheat, as we know it, was developed. Both whole wheat flour and all-purpose (white) flour are made from kernels of wheat. A wheat kernel is divided into three major parts—bran, endosperm and germ. All-purpose flour is made from only ground endosperm. Whole wheat flour is made by grinding the entire wheat kernel. When shopping for 100 percent whole wheat bread, look for a label that has the words “whole wheat.”

## Social Studies

1. Read and discuss background.

## Math/Science

### Advance preparations

**(Enlist parents or older students to help with this activity.)**

1. Gather materials for making the bread. (See list of ingredients on next page. Many of the ingredients will be available from your school’s food service.) Pre-measure ingredients into kits, and mark the bags 1, 2 or 3 and the cups 1 and 2, as indicated below. For each kit you will need the following:

Bag # 1: 1/3 cup all-purpose flour; 2 teaspoons yeast.

Bag # 2: 1 1/4 cup whole wheat flour; 1 teaspoon salt.

Bag # 3: 1 cup all-purpose flour.

Cup # 1: 2 teaspoons honey.

Cup # 2: 2 teaspoons honey and 2 teaspoons oil.

One 6-ounce plastic cup marked for 1/2 cup and 1/3 cup.

One 2-gallon plastic bag.

Two aluminum pans marked with students’ names. (Use masking tape and markers.)

2. Clean tables or desk tops with hot, soapy water, then tape white paper down. Each pair of partners will need to face one another.

### Class discussion

1. Bring a variety of wheat products to class, and ask students to list the ingredient they have in common that might have grown in Oklahoma.
2. Discuss safe food handling principles, and have students wash their hands thoroughly.
3. Pair students up to make the bread. Have students sit facing one another. Before handing out kits, make sure students understand they must not open any of the bags until instructed to do so. Discuss the importance of following instructions when cooking.

### Making the bread

1. Provide one kit for each pair of students.
2. For each bread-making team, have one student roll down the top of the 2-gallon plastic bags to form a bowl and hold it while the other student

- adds the contents of Bag # 1, Cup # 1 and 1/3 cup of warm water.
3. Have students unroll their bags, hold them tightly at the base, and use their fingertips (not nails) to mix the ingredients together.
  4. Have students close their bags loosely by rolling down the tops as in a log roll. Share some of the background information while you wait for the mixture to rest (about 10 minutes).
  5. Have one student roll the top of the bag back into mixing bowl position and hold it while the other student adds Bag # 2, Cup # 2 and 1/2 cup warm water.
  6. Have students unroll the tops of the bags, squeeze out the air, hold the bag tightly toward the bottom and mix gently from the outside of the bag. Students should keep mixing until all the ingredients are distributed evenly.
  7. Have one student form the bag into a bowl and hold it while the other student adds about half the contents of Bag # 3.
  8. Have students unroll the tops of their bags and mix the ingredients thoroughly until all flour is dispersed.
  9. Have students lightly dust their desks with flour and roll the dough out of the bag by rolling the sides down, then turning the bag inside out.
  10. Have students gently work in enough flour to make the dough soft, but not sticky. Caution students that too much flour will make the dough stiff and cause the bread to be tough.
  11. When the dough is ready, have students use the dough scraper to cut it into two equal parts.
  12. Demonstrate kneading the bread. Fold it over with your fingertips and press with the heel of your hand. Turn, and repeat. Have students knead their dough for 10 minutes. To help students keep track of their kneading time, prerecord some music that lasts approximately 10 minutes and play it while students are kneading. Dough is ready when it has elasticity.
  13. Let dough rest by covering for 10 minutes. Share more of the background information, or read aloud one of the books listed in the resource section below.
  14. Have each student form his or her loaf into the shape of the pan.
  15. Have students move loaves to a warm place and leave them until they double in bulk.
  16. Bake at 350 degrees F in a conventional oven for 25-30 minutes or at 300 degrees F for 18-20 minutes in a convection oven . Students may take their loaves home to share with their families or enjoy the bread during class.

### Extra Reading

Harbison, Elizabeth M., and John Harbison, *Loaves of Fun: A History of Bread With Activities and Recipes from Around the World*, Chicago Review, 1997.

Johnson, Sylvia, *Wheat*, Lerner, 1990.

Whitmore, Arvella, *The Bread Winner*, Houghton Mifflin, 1990.

### Vocabulary

**bran**—The outer layers of the grain of cereals such as wheat, removed during the process of milling and used as a source of dietary fiber.

**endosperm**—The nutritive portion of a seed.

**germ**—The embryo of a seed.

**millstone**—One of a pair of cylindrical stones used in a mill for grinding grain.