

Breads Around the World



LEVEL: Grades 4-12

SUBJECTS: Social Studies (Geography, History), Family and Consumer Science, Health, Science

SKILLS: Collaborating, comparing similarities and differences, comprehending, concluding, cooperating, creating charts, describing, developing cultural awareness, developing vocabulary, discussing, following directions, generalizing, identifying, inferring, locating, matching, reading, reading maps, reasoning, solving problems

MATERIALS

Writing materials; scissors; glue or clear tape; flour; corn, rice, and wheat kernels (and others such as oats, rye, and quinoa, if available); transparency of the **Food Guide Pyramid** and photocopies of the **Outline Map of the World** sheets located in the Appendixes; transparency of the attached **The Big Three Grains**; photocopies of the attached **The Big Three Clues**, **The Big Three Chart**, and **Breads Around the World** sheets. **Optional:** globes; transparency pen; samples of as many cultural bread forms as possible (see the pictures on the **Breads Around the World** sheet; a local bakery may donate kinds of breads and/or students can bring in samples); breadmaking machine; bread recipes from around the world.

VOCABULARY

bagel, baguette, carbohydrates, chapati, corn bread, flat bread, grain, milling, minerals, pita, protein, quick bread, scone, soda bread, steamed buns, tortilla, vitamins, yeast bread, and other breads you wish to include

RELATED LESSONS

Mighty Macros
Feed the Need

SUPPORTING INFORMATION

Is there anything like a warm, crusty bread right from the oven to say welcome,

comfort, nutrition, and hospitality?

Throughout the world, the aroma of freshly baked bread fills kitchens, food preparation areas, and bakeries with the mouth-watering promise of good eating to come. Bread takes many different forms, and bakers around the world have created breads in all shapes, textures and flavors. Hearty, chewy, crusty; flat and crispy or thin and flexible; delicate, sweet and savory. There's a bread for every taste.

History of Bread

All countries and cultures have some form of bread. Bread is the world's most widely eaten food and has been a main part of the human diet since prehistoric times. Breadmaking began very simply by grinding some kind of grain into flour, adding liquid to the flour and baking the dough on hot rocks.

In some countries, families still make their own breads in much the same way using locally grown grains. Thanks to exporting and importing, families in



BRIEF DESCRIPTION

Students learn the cultural and nutritional significance of bread throughout the world by working in groups to solve a logic-matrix activity.

OBJECTIVES

The student will work in a group to:

- describe the significance of bread in world nutrition and culture;
- identify the three main global food grain crops and match forms of bread to them;
- identify 10 forms of bread along with the cultures in which they developed; and
- locate the countries or regions of origin of the 10 cultures on a world map.

ESTIMATED TEACHING TIME

Session One: 20 to 30 minutes.

Sessions Two and Three: 45 to 60 minutes each.

many countries have a variety of grains and flours from which they can make bread. But breadmaking today can be a more involved process and may include eggs, leavening agents such as yeast or baking powder, and flavorings such as salt, herbs, fruits, vegetables, or nuts — for hundreds of delicious variations.

Bread in many cultures was - and still may be - a symbol of harvest, fruitfulness and fertility. Bread is used in many harvest festivals. It is a communion host in Christian traditions, a ladder to heaven (challah) and a Passover symbol (matzo) in Jewish tradition, and a ring of life to many Greeks. People break bread together as a symbol of peace, and they share bread fresh from the oven in friendship and nurturing.

Whole Grains

Grains are simply the seeds or fruits of grasses. They belong to a group of grasses called cereals or cereal grains and include wheat, corn, rice, oats, rye, buckwheat, millet, sorghum (milo), barley, quinoa, amaranth, and triticale (a high-yield grain developed by crossing wheat for its gluten and rye for its hardness). Buckwheat, quinoa and amaranth are not grasses, but are included in the cereal grains category.

All grains have basically the same structure. Each kernel or grain, has a tiny “germ” or seed at its core. It represents from 2 to 3 percent of the seed’s weight and is the embryo from which new plants develop. The germ is surrounded by the endosperm, which is a storage packet of starch (a complex carbohydrate) encased in protein to nourish the young plant in its early growth, if the seed sprouts. Gluten is an elastic protein within the endosperm that stretches like bubble gum when wet and expands to hold the gas that yeast generates. Protecting the germ and endosperm is the bran or hull, which is a tough, fibrous, hard covering.

Grains are the primary raw material in bread. The kind of grain used largely determines the flavor, texture and nutrition of the bread. Wheat, rye, oats, and barley were the primary grains in Europe during the Middle Ages. The principal grains grown in the world today are wheat, corn and rice; these three provide more than half of the world’s food from plants.

Wheat has been cultivated and used for human food for many thousands of years. People have used wheat to make bread throughout recorded history. It is believed that wheat was first cultivated between the Tigris and Euphrates rivers in an area called the Fertile Crescent. It has been grown in Egypt since about 4000 B.C. and in China since at least 2800 B.C. The ancient Egyptians ground wheat into flour, combined it with liquid, and baked it into bread. They discovered

the property of wheat that has made this the most popular grain for bread baking: the ability of wheat dough to rise and form a high loaf when yeast is added as a fermenting agent. Centuries later, scientists showed that an elastic protein called gluten makes wheat the best possible flour for breads. (Gluten gives structure and elasticity to the dough.)

Wild wheat was not native to the Western Hemisphere. Wheat seeds were brought to North America by Columbus, Cortez, and European immigrants who sowed them far and wide and gave us the “amber waves of grain” in the song “America the Beautiful.” Today, the United States is the world’s largest producer of wheat, but wheat was of little or no importance in North America in the 1700s. George Washington raised wheat on his farm, but mainly as a hobby. During that time most American farmers raised crops only for the family and the nearest town. Wheat did not become a major crop in America until after the French Revolution in the late 1700s. In addition to the war, Europe was experiencing large-scale urban growth, crop failures from drought, and potato blight. America responded to the need for grain in Europe by growing more wheat and exporting it to England and France. From 1865, America became a major wheat exporter to Europe. Because of the dominance of rice in the Far East, wheat was not exported to southeast Asia until the 1870s.

Fairly dry and mild climates are the most favorable for growing wheat. In general, wheat needs lots of sunshine, 12 to 15 inches (30.5-38 centimeters [cm]) of water, and temperatures of 70 to 75 F (21 to 24 C). Winter wheat is planted in the fall and harvested the following spring or summer. It needs a period of cold weather with short days and long nights to flower. When the temperature drops below freezing, wheat becomes dormant. Spring wheat is planted in the spring and becomes fully ripe in the summer. Extreme heat or cold and very wet or very dry conditions will destroy both winter and spring wheat.

Wheat is by far the world’s largest and most widely cultivated food crop: one-seventh of all farmland around the world is used for growing it. Every moment of the year, somewhere a farmer is harvesting this grain as another is planting it. Today, American wheat is exported and feeds millions of people throughout the world, and new varieties of wheat have made it possible for the king of grains to be grown essentially worldwide. The leading wheat-producing countries are the United States, China, India, Russia, France, Canada, Ukraine, Turkey, Germany, and Pakistan. Wheat is a hardy crop that can sometimes be grown where other crops cannot.

Although the primary purpose of wheat is to feed people, it has other uses as well. The bran and germ removed during the milling process are used as food for livestock. Industry uses the outer coating to polish metal and glass. Adhesives made from wheat starch holds layers of plywood together. Alcohol made from wheat is used as a fuel and to manufacture synthetic rubber and other products. The stems of wheat plants are dried to make straw, which can be made into strawboard for boxes, woven into items such as baskets and hats or used as bedding for animals.

Corn is a grain that is tens of thousands of years old. Corn pollen grains dated as 80,000 years old were found in rocks about 200 feet below present day Mexico City. Most archaeo-botanists agree that corn migrated from Mesoamerica along sea and land routes to South America. It also migrated into North America and was cultivated by various Indian tribes such as the Mogollon, the Hohokam, and the Anasazi.

There is not any evidence of the early existence of maize or corn in the Old World, but maize already had a long and illustrious history when Christopher Columbus found it growing in 1492. In North America, the American Indians were cultivating several different types of maize. Columbus took seeds from the grain back to Spain. Maize had two distinct advantages over wheat: it could be grown in three months and did not require oxen or plows to cultivate the soil. Within one generation it had spread through Southern Europe, and within two generations, around the world. The American Indians also taught the Pilgrims how to plant, cultivate and enjoy maize, which was an important aid to their survival after their own food supplies ran low. Today maize, or what we call corn, is one of our nation's top agricultural commodities. (The Pilgrims called maize "Indian corn" and Americans have called it corn ever since. Today, corn is still correctly called maize.)

Corn can be grown in most mild and tropical regions of the world. It will grow wherever there is suitable soil, freedom from frost and cold nights for at least 60 days, plenty of hot sun when maturing, and ample soil moisture during the hot season. It grows best in those parts of the Northern Hemisphere with daily July temperatures of 70 to 80 F (21 to 27 C) and a rainfall of at least 20 inches (51 cm) a year, with ample rain distributed throughout the growing season.



The major corn-producing countries are the United States, Brazil, Argentina, China, Mexico, Romania, Ukraine, Yugoslavia, France, India, Indonesia, South Africa, and Philippines. The United States is the world's leading producer and exporter of corn, producing 36 percent of the world's supply. Corn is the chief food of most Mexicans, with the tortilla as the primary bread. (Tortillas also can be made from wheat.) No other crop is distributed over so large an area of the world, and corn is second (after wheat) in world grain production.

Corn can be found in more than 4,000 food and nonfood products. It is used to make bread, breakfast cereals, chips, and many other food products. Corn is the leading source of sweetener and is found in thousands of food items including sodas and candy. It also is used to make industrial products such as ceramics, pharmaceutical drugs (e.g., penicillin and other antibiotics), paints, paper goods, textiles, batteries, fireworks, biodegradable packing materials, and much more. In the United States, about 50 percent of the corn crop is fed to livestock (hogs, cattle, sheep, and poultry).

Rice is the staple food for more than half the people in the world today. For many it is their main source of protein, and for some it is their only protein. To most Americans, however, rice is casually treated as "filler food" to go along with meat, fish or poultry. It is the third largest grain crop produced in the world. Rice is a native of Asia, where it was grown and used for food even before written records were kept. It arrived on the shores of North America in 1694, when a ship sailing from Madagascar to England was blown off course and forced to land at Charleston, South Carolina. The ship's captain gave the governor a handful of rough rice grains, which the colonists used for seed. Arkansas, California, Louisiana, Mississippi, Missouri, and Texas produce most of the nation's rice.

Rice thrives in tropical areas because of the warm, wet climate that it requires. Rice fields are flooded to provide growing plants with moisture and to kill weeds and other pests. Rice can be grown where there is an annual rainfall of at least 40 inches (101.6 cm) or where water is available for irrigation. During the growing season rice needs an average temperature of at least 70 F (21 C).

Rice is inexpensive, easy to prepare and store, and it mixes well with lots of flavors. It can be made into breakfast cereals. Rice flour, both white and brown, is finely milled and used to make noodles, pancakes, breads, cakes, and muffins, usually in combination with wheat flour. For people on gluten-free diets, rice flour can be used alone. A wild rice, the “bread” of many American Indians, is not really rice, but the seed of an aquatic grass that is native to America. It is an elite grain, expensive, delicious, and difficult to grow.

Rice is grown in more than 100 countries. China and India are the top rice-producing countries, growing more than 50 percent of the world’s rice. Other top producers include Bangladesh, Burma, Indonesia, Japan, Thailand, Vietnam, Brazil, and Philippines. The United States grows about 1 percent of the world’s rice. Most rice is eaten in the country in which it is grown - less than 5 percent of the world’s rice crop is traded internationally.

Like wheat, rice is primarily used to feed people. Rice does have some industrial uses. For example, rice hulls have been used as an ingredient in fertilizer, insulation, cement, and a liquid chemical *furfural* (used as a solvent and to make plastics). Rice starch is the basis for most face powders. Many people in Asia use the dried stalks (straw) to thatch roofs and to weave items such as baskets, mats, sandals, hats, brooms, and rope.

Grains and the Food Guide Pyramid

A balance of foods is needed for a healthy diet. Breads, cereal and pasta are all foods made from grains. They are the food group that forms the broad base of healthful eating. The **Food Guide Pyramid** suggests six to 11 servings a day from these foods. No matter who we are, we should choose more servings per day from this group than any other because of the nutrients that the grains in these foods provide.

When the entire grain is used, it provides carbohydrates (a main source of energy) and protein (needed to build strong muscles, repair and build new body tissue, and keep skin, hair, and nails healthy). Grains also provide some vitamins and minerals and are low in fat. The following table displays the percentage of complex carbohydrates, proteins, fats, water, and vitamins and minerals for a kernel of corn, rice and wheat.

	Corn	Rice	Wheat
Complex carbohydrates	72%	80%	65-70%
Proteins	9%	7%	7-15%
Fat	4%	0.4%	2%
Water	14%	12%	13%
Vitamins and minerals	1%	0.6%	2%

The staff of life normally refers to bread. In Europe and North America, it is bread made from wheat. Wheat provides more nourishment for the people of this planet than any other single food. When wheat was first grown in America, its only purpose was for making bread. Today, it remains an important grain whose primary purpose is to feed people. The protein in wheat lacks two essential amino acids: lysine and tryptophan. Wheat provides vitamin E, the B vitamins (niacin, riboflavin, and thiamine), and the minerals iron and phosphorus.

Corn is deficient in the same two essential amino acids as wheat. It also is deficient in niacin. Corn is a reasonably good source of B vitamins, vitamins A and C, potassium, and dietary fiber. It is a low-sodium food until salt is added in processing, cooking, or at the table. The gluten is of a poorer quality compared with wheat and, as a result, corn flour does not make very good bread.

Rice is the staff of life for more than half of the world’s population, who depend on it for fundamental, daily nutrition. Because rice contains very little gluten, which holds bread dough together, it is not often used to make bread. Rice is ground into flour to make rice cakes and pastry. It contains the same B vitamins as wheat and two additional minerals - potassium and sodium. Rice is highly digestible for everyone from infants to the elderly, and is suitable for special diets because it is nonallergenic and free of gluten. Brown rice is the whole unpolished rice grain, with only the outer hull and a small portion of the bran removed. Polished white rice has been stripped of its most nourishing outer layers — the bran and germ — leaving behind almost pure starch (complex carbohydrate). Still, white rice is overwhelmingly the most popular form of rice sold in the United States, as well as in the rest of the world.

Donuts, muffins and sweet rolls also are made from grains. The grain’s nutrition, however, is overwhelmed by the fat and sugar in the recipes from which they are made. For example, a plain bagel contains 200 calories, no sugar, and 2 grams of fat. On the other hand, a glazed donut has about 235 calories, sugar, and 12 grams of fat. A large croissant has about 300 calories and 17 grams of fat. A sweet roll with nuts and raisins, Danish filling, and sugary icing can “take the cake,” with about 360 calories and 22.3 grams of fat. (Note: Some breads may have a higher caloric, sugar and fat content than the plain bagel. Food labels provide nutrition labeling for most foods. Breads are generally wrapped in plastic bags that have food labels printed

on them. These labels identify the number of calories and the amount of sugar and fat. See the **Food Label** located in the Appendixes.)

Milling or Refining

Our ancestors ground grains into a coarse cereal or into flour by crushing the grains between two flat rocks. This was the beginning of the milling of wheat and other grains. People ate whole wheat bread or types of whole grain bread for hundreds of years because white wheat flour required hours of hard labor to mill. During the late 1800s, however, millers developed machinery that milled white flour inexpensively. White bread was a common food by 1900.

When commercial mills process wheat into white flour, the bran and the germ are removed. That means the nutrients they provide also are removed. The bran and germ together provide large amounts of the B vitamins (niacin, riboflavin, and thiamine), trace minerals, and dietary fiber and small amounts of protein (less than 30 percent).

White flour is made from the finely ground endosperm of the wheat kernel. The endosperm contains the greatest share of protein (about 70 percent), carbohydrates, and iron, and is a source of soluble fiber, but has lower amounts of the B vitamins. When the flour is exposed to chlorine gas or benzoyl peroxide to whiten and brighten the flour, it is called bleached flour. If the flour is bleached by oxygen in the air during an aging process, the flour is off-white in color and is called unbleached flour.

Whole wheat flour is made from the whole kernel (germ, bran, and endosperm). It is rich in B vitamins and protein and contains more trace minerals and dietary fiber than white flour.

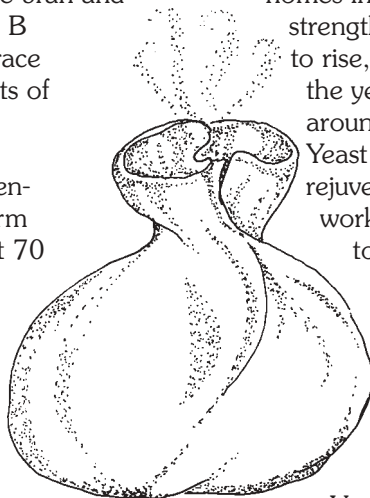
In the 1930s, U.S. public health officials reported a large number of cases of beriberi and pellagra. These diseases are caused by a lack of B vitamins (thiamine, riboflavin, niacin). In 1941, many U.S. bakeries agreed to begin enriching white bread with B vitamins and iron to fight the diseases. Almost all of the nation's bakeries have sold enriched white bread since the mid-1950s, and beriberi and pellagra are now rare in the United States. To make up for the loss of vitamins and minerals from the milling process, the U. S. government established standards for making enriched flour. Each pound of enriched flour must contain at least 1.66 milligrams (mg) of thiamine, 1.2 mg of riboflavin, 6 mg of nicotinic acid, and 6 mg of iron.

More than 95 percent of all commercial white bread sold in the United States today is enriched. Enriched white bread and whole wheat bread are similar in food value. They are high in carbohydrates and proteins, low in fat, and contain the B vitamins and minerals such as iron, phosphorus, and magnesium. Whole wheat bread, however, also includes bran, an important source of fiber.

Three Main Types of Breads

There may be hundreds of variations of bread, but they fall into three main types.

Yeast breads are leavened breads made with yeast, a microscopic, one-celled organism in the fungus family. The mission of yeast is to transform oxygen and sugars into carbon dioxide gases and alcohol, which then find homes in the cell walls of dough that has been strengthened by gluten. This causes the dough to rise, until it faces heat in the oven. Then the yeast dies, but the structure of the bread around the bubbles remains baked into place. Yeast dough can be frozen; it begins to rejuvenate at about 50 F (10 C). Its best working temperatures are 78 to 85 F (25.5 to 29 C). These temperatures (like the temperature of the liquid the yeast is dissolved in) and the amount of food available for yeast to feed on are critical factors in the life of yeast. Ignore these factors and the yeast dies and the bread dough will not rise.



Yeast breads are eaten by most people in the United States, Canada, and many European nations. White bread is the most popular variety, but other yeast breads are gaining favor as world breads become growing enterprises. Yeast breads make up about 99 percent of the bread baked in the United States. Hamburger and hot dog buns, other rolls, croissants, Danish pastries, English muffins and crumpets (England), Kugelhof (Austria and France), brioche (French buns), challah (Jewish braided bread), and loaves such as whole wheat, cracked wheat, pumpernickel, rye, and rolled oats are examples of yeast breads.

Quick breads are loaves that require no kneading or rising. They are descendants of hearth cakes of long ago. Some credit England's King Alfred with inventing "quick cakes" by accident. He forgot to watch the pot of porridge as he sat in his hut; he finally discovered that it had cooked into a bread. The American Indians taught the early colonists to bake cornmeal over a fire into hot cakes.

Most quick breads contain baking soda and/or baking powder, other ways to leaven breads or make them rise. They can be made quickly and only require simple steps. Baking powder is a gas-forming agent, a mixture of acid and alkali that reacts chemically when mixed with a liquid. It produces a texture more like cake and rarely one like yeast bread, even though they both use carbon dioxide. The two kinds of baking powder include single- and double-acting. Double-acting baking powder offers more help by working twice in the breadmaking process. It starts creating bubbles that cause dough to rise when liquid is added to the dry ingredients. The second agent is activated by oven heat when the bread bakes.

Baking soda is the working partner of acidic buttermilk, yogurt, sour milk, sour cream, fruit juices, and the family of sourdough starters. It is the oldest chemical leavener, a neutralizer of acids that all of these wet ingredients contain. The resultant gases work immediately, causing breads to expand, so they must be rushed from dough to oven.

Quick breads became popular in the United States in the last half of the 19th century when baking powder became readily available. Today's quick breads include quick loaves such as corn bread or banana bread, muffins, biscuits, coffee cakes, scones, pancakes, and waffles.

Flat breads are more common in many parts of the world than in the United States. Most flat breads are unleavened. They are made from either batters or kneaded dough. Often they are cooked on the stovetop rather than baked in an oven. Flat breads offer a delightful range of textures. Some are crackling crisp, others thin and pliable. They are easy to mix and quick to cook. Flat breads include tortillas (Mexico); Jewish matzah; crepes and crepe-like chickpea flour bread (France); dosas, chapatis, and parathas (India); Mandarin pancakes and scallion bread (China); okonomiyaki (Japan); pita bread and Lebanese wrapper bread (Middle East); and various crackers from around the world. Pita and Lebanese wrapper breads are made from yeasted dough and flattened to rise before baking. Crackers are rolled thinly and baked quickly; they all end up flat, including the ones which use leavening.

Whether you bake it or buy it, bread is a food that can be enjoyed with anything - or nothing! It's found around the world in many kinds, shapes and sizes,

including baguettes, bagels, tortillas, rolls, crackers, popovers, pancakes, pretzels, pita, matzo, and many more. Bread inventors and their descendants carried their recipes to every part of America. Making bread would be a great way to "rise" to the occasion as you explore grains and breads around the world.

GETTING STARTED

Gather writing materials, scissors, glue or clear tape, flour (small amount in a clear sealed bag), and kernels. Make a transparency of the **Food Guide Pyramid** and **The Big Three Grains**. Photocopy **The Big Three Clues**, **The Big Three Chart**, **Breads Around the World**, and **Outline Map of the World** sheets for pairs of students.

PROCEDURE

SESSION ONE

1. A balance of foods are needed for a healthy diet. Show the **Food Guide Pyramid** transparency. Ask:

- As you look at this pyramid, from which food group is it suggested that we choose the most servings? (*Breads, cereal, rice, and pasta.*)
- What is the main ingredient in each of these foods? (*grains*) Note: If students respond that flour is the main ingredient, accept that answer. Grinding grains to make flour is explored in Step 2.
- Why do you think breads have been called the staff of life? (*They are important to good health.*) Tell students that grains are important for providing carbohydrates, proteins, vitamins, and minerals. Grains are also low in fat. **Optional:** Share the Supporting Information about nutrition.
- Cakes, donuts, muffins, and pastry also are made from grains. How are they different from breads? (*They generally contain more fat and sugar, which outweigh the good nutrition of the grain.* Share examples from Supporting Information.) **Optional:** Have a food label available. Discuss the importance of food labels. Point out to students the location of the number of calories and sugar and fat content.
- What is your favorite bread? Why?



- What are some of the different ways in which you eat bread?
2. Explain to students that people use many different grains to make bread. People most often use the grains that grow in their own parts of the world to make the breads. Show students different grains. Ask:
 - What needs to happen to the grain before it can be used to make bread? (Invite answers, then show the bag of flour.)
 - How could these kernels be turned into flour? (Discuss grinding, pounding with rocks or tools, milling, and others. Share Supporting Information. See Extensions and Variations 2.)

SESSION TWO

1. Ask students which grains they think are used to make most of the breads around the world. Tell students that today, the world's three main grain food crops are wheat, corn and rice. Show and discuss the transparency **The Big Three Grains**. Explain that these three grains provide more than half of the world's food from plants (grains are actually the seed or fruit of cereal grasses). Tell students they are going to explore how different cultures use these grains to make different breads.
2. Divide the class into pairs of students. Distribute **The Big Three Clues**, **The Big Three Chart**, and **Breads Around the World** sheets to the pairs. Tell students to cut apart the pictures of the breads on the **Breads Around the World** sheet.

Optional: For younger students or as an alternative, solve the logic matrix as a whole-class activity. Make a transparency of **The Big Three Chart** and get a transparency pen. Divide the class into 10 groups. Distribute one bread card to each group. Read the directions on **The Big Three Clues** sheet to the class. The students in each group read their clues to the rest of the class. The class determines the culture, bread and grain. Using the transparency, place an X under the grains that the bread is not made from and write the name of the bread under the grain from which it is made.
3. Pairs of students read the clues on **The Big Three Clues** sheet to identify the culture, the bread and the grain. They complete **The Big Three Chart** by putting an X under the grains the bread is not traditionally made from and by gluing or taping the picture of the bread across from the name of the culture and below the correct grain. (Note: An answer key is provided for your use after Educator's Notes.) **For younger students**, read the directions on the top of **The Big Three Clues** sheet together, making sure they understand the task.
4. Have each pair of students compare **The Big Three Chart** with another pair of students. Tell them to look at any differences in where they placed the breads and to make changes, if necessary.
5. After all the student pairs have compared **The Big Three Chart** with another pair, read the clues as a class and have students identify the culture, bread and grain. Have students save **The Big Three Chart** for use in Session Three.
6. Summarize this session by asking:
 - Which of these breads have you eaten? Which new ones would you like to eat? Why?
 - Why do breads look so different from one another? (*They are made of different ingredients, shaped and cooked differently, baked differently, made by different cultures, and more.*)
 - What did you learn about wheat? (Students should be able to find the following information from their clues for all three grains. *It is the world's most widely cultivated grain. It nourishes more people than any other single food. One-seventh of all farmland around the world grows wheat. It is the main grain used to make bread in the United States. It can be planted in both spring and fall.*)
 - What did you learn about corn? (*Corn is second in world grain production. Columbus took corn back to Spain from America. American Indians called it "maize." They showed the Pilgrims how to plant and cultivate it.*)
 - What did you learn about rice? (*Rice thrives in tropical areas because of the warm, wet climate. Fields planted with rice are flooded to provide moisture for growing plants and to kill weeds and other pests. It is the world's third-leading grain and the main source of protein for more than half of the people in the world.*)

- What statements can you make and what can you conclude about the importance of grain to nutrition of people around the world?

- What breads have you heard about that you want to try in the future? Why?
- What is the most interesting thing you learned about breads? Why?
- If you invented a new bread, what would it be called, made of, look like, and be used for; how would you advertise it; and so on? (See Extensions and Variations 5.)

SESSION THREE

1. Distribute the **Outline Map of the World** sheet to student pairs. They use the information on **The Big Three Chart** to locate each country on their **Outline Map of the World**. Have students write the name of the bread on the map next to the country or region it represents. Tell students to color the countries or regions according to the type of grain (corn, rice or wheat) used for the bread. Have them include a map legend on their map. For example:

MAP LEGEND

yellow	=	corn
green	=	rice
blue	=	wheat

2. Students challenge their partner to match each bread to its culture. One partner gives the name of a bread and the other tells the matching culture and country or region for the bread and the grain used to make it. Students switch roles and repeat the process for all 10 breads. Have students choose one or more breads and challenge them to come up with a fun way to help others remember the name of the bread, its culture, and the main grain. They can use poetry, write a limerick, develop a mnemonic device, and more.

Optional: Share with the students the details in the Supporting Information about the climate and top grain-producing countries or regions for each grain. Ask students to shade in the countries or regions on the map, using the same Map Legend from Step 1. Have them draw conclusions for each grain. Ask, "How do you think the location and climate of the country or region might affect the kind of bread people eat?"

3. Summarize by asking:
 - What do you notice about the location of each country or region?
 - What particular breads do your family prepare or eat related to holidays, celebrations, religious ceremonies, and other special occasions?
 - Does your family use old family recipes? If so, how old are the recipes, what do they make, and what culture and countries are they from?

EVALUATION OPTIONS

1. Students match a list of the countries or regions and/or cultures the breads represented.
2. Have students list the three main global food crops, and write the name of at least one bread coming from each.
3. Students write a story describing a situation or celebration revolving around bread and its importance.
4. Students write a paragraph using one of the following phrases.
 - Grains are important to me because...
 - My favorite bread is ____ because...
5. Have students write a paragraph about how bread has been important in nutrition and culture throughout human history.

EXTENSIONS AND VARIATIONS

1. You and/or students bring in different breads for a bread-tasting session. (Note: Bakeries may donate sample breads, particularly day-old breads.) Invite observations about the taste, texture, color, and so on, and guess the main grain in each. Have students share what they learned about the three main grains and why bread is called the staff of life.
2. "Grind" your own grains. Bring in raw grains and see what happens when they are pounded between hard rocks, crushed with a hammer, or processed through a food grinder or blender. Or take a field trip to a flour mill or a bread bakery. Have students write at least one paragraph about what they learned (e.g., steps involved in the milling process, type of equipment used at mill or bakery, amount of bread made every day, kinds of bread made, packaging, transportation, and more).
3. Encourage students to research the breads that are important in their cultural heritage and share their findings (and samples) with the class.

4. Research other breads to learn about the culture, country, and main grain. Possible breads include sourdough bread, naan (a cracker-like bread), limpa (sweet rye bread), kulich (Russian holiday coffee cake), croissant (French flaky-crisp roll), fatayir (Lebanese spinach buns), and brioche (French bun).
5. Have students brainstorm why they think bread comes in so many different shapes, then create and name their bread shapes. Use frozen bread dough (thawed) to form the shapes. Bake as directed.
6. Use grain plants for crafts and decorations. With illustrations and pictures of examples from craft books in your media center, you can make grain seed mosaics, cornhusk dolls, cornstalk decorations, scarecrows, wheatstalk ornaments, and more. Check with your art specialist or community resource people for an “artist in residence” or a mentor as you work with these materials.
7. Explore the scientific principles of leavening with one or both of the following demonstrations.
 - A. Give each student a straw and a small paper cup with dishwashing liquid dissolved in the water. Ask them to blow gently into the liquid, using their straws. Ask students for their ideas about what made bubbles form. Explain that yeast is used to make bread because it acts in a similar way, to produce bubbles. Pass around granules of yeast and have students look at the yeast through a magnifying glass. To demonstrate the growth of yeast, dissolve a packet (about a tablespoon) in warm water (about 1/2 cup) and a pinch of sugar in a clean, empty soda bottle. Put a deflated balloon over the neck of the bottle. Together watch what happens. Ask students to explain what makes the bubbles. (*Yeast uses food such as sugar to produce energy. The yeast causes the sugar to change into alcohol, carbon dioxide gas, and energy. The bubbles are carbon dioxide and they push the dough up and outward during baking, causing the dough to rise. The carbon dioxide gas is inflating the balloon.*) Now examine a piece of bread. Can students see where the bubbles formed as the bread rose and baked?
 - B. Encourage students to experiment with adding baking powder to different liquids such as water, vinegar, milk, and buttermilk, and then form hypotheses about how baking powder works. (*The acid and the alkali in baking powder react with liquids to form carbon dioxide gas. This gas forms tiny bubbles in the dough. Since the bubbles expand quickly, so does the dough.*)
8. Learn more about yeast. Record students’ inquiries by using a chart divided into three columns: What we know; What we want to know; What we learned. Invite students to design experiments that will help answer their questions. Some might wonder how the amount of yeast can affect the rising of the dough; how to determine if yeast is good and will work; the effect on bread of too much yeast, and so on. Complete the chart as students report results.
9. Use bread recipes for mathematics lessons. Provide measuring cups and spoons to chart and make comparisons of how many tablespoons in a cup, a pint, a quart, and so on. Have students figure the amounts of ingredients needed if a bread recipe was halved or doubled. See the FLP lesson “Let’s Celebrate!” for recipes.
10. Create a breadboard bulletin board display with a world map. Ask students to find and contribute pictures of breads from throughout the world. Label each picture with the name of the bread and use string or yarn to connect it to the country. Include the word for bread in the country’s language. For example, bread in Spanish is pan; in German it’s brot; and in French it’s pain.
11. Explore growing conditions of various grains. What does it take regarding climate, soil, terrain, and so on, for certain grains to do well in a location? Plot where grains grow on a world map and make correlations with (1) climate and growing conditions and (2) grain-based foods eaten in those areas.

CREDITS

Food Guide Pyramid from the U.S. Departments of Agriculture and of Health and Human Services.

Outline Map of the World used with permission of The World Bank.

ADDITIONAL RESOURCES

Aliki. *Corn is Maize*. HarperCollins Publishers. 1976. ISBN: 0690009755.

Badt, Karen Luisa. *Pass the Bread!* Children’s Press. 1997. ISBN: 0516481916.

Bial, Raymond. *Corn Belt Harvest*. Houghton Mifflin Company. 1991. ISBN: 0395562341.

Burckhardt, Ann. *Corn*. Bridgestone Books. 1996. ISBN: 1560654503.

Curtis, Neil and Peter Greenland. *How Bread is Made*. Lerner Publishing Group. 1992. ISBN: 0822523752.

Demi (illustrator). *One Grain of Rice: A Mathematical Folktale*. Scholastic Trade. 1997. ISBN: 059093998X.

Dooley, Nora. *Everybody Bakes Bread*. Carolrhoda Books. 1996. ISBN: 087614864X.

Dooley, Nora. *Everybody Cooks Rice*. First Avenue Editions. 1992. ISBN: 0876145918.

Finch, Mary. *The Little Red Hen and the Ear of Wheat*. Barefoot Books. 2001. ISBN: 184148234X.

Fowler, Allan. *The Wheat We Eat*. Children's Press. 1999. ISBN: 0516212125.

Gelman, Rita Golden. *Rice Is Life*. Henry Holt and Company 2000. ISBN: 0805057196.

Gershator, David and Philip Gershator. *Bread is for Eating*. Henry Holt and Company. 1995. ISBN: 0805031731.

Harbison, Elizabeth. *Loaves of Fun: A History of Bread With Activities and Recipes from Around the World*. Chicago Review Press. 1997. ISBN: 1556523114.

Hoopes, Lyn Littlefield. *The Unbeatable Bread*. Penguin USA. 1996. ISBN: 0803716117.

Jones, Judith and Evan Jones. *Knead It, Punch It, Bake It!: The Ultimate Breadmaking Book for Parents and Kids*. Houghton Mifflin Company. 1998. ISBN: 0395892562.

Knowlton, Laurie Lazzaro. *Nana's Rice Pie*. Pelican Publishing Company. ISBN: 1565542347.

Landau, Elaine. *Wheat: A True Book*. Children's Press. 1999. ISBN: 0516210297.

Landau, Elaine. *Corn: A True Book*. Children's Press. 1999. ISBN: 0516210262.

Merrison, Lynne. *Rice: Foods We Eat*. Carolrhoda Books. ISBN: 0876144172.

Morris, Ann. *Bread Bread Bread*. Mulberry Books. 1993. ISBN: 0688122752.

Paulsen, Gary. *The Tortilla Factory*. Voyager Picture Book. 1998. ISBN: 0152016988.

Pittman, Helena Clare. *A Grain of Rice*. Skylark. 1996. ISBN: 044041301X.

Powell, Jillian. *Everyone Eats Rice*. Raintree/Steck-Vaughn. 1997. ISBN: 0817247580.

Robinette. *Hot Corn Muffins*. D C Heath & Company. 1987. ISBN: 0669137650.

Rohmer, Harriet. *Legend of Food Mountain*. Children's Books. 1987. ISBN: 0892390220.

Whitmore, Arvella. *The Bread Winner*. Houghton Mifflin Company. 1990. ISBN: 0395537053.

WEB SITES

American Corn Growers Association. 2002. <http://acga.org/>

California Rice Commission. 2002. <http://www.calrice.org/>

Corn Cam. Iowa Farmer. 2002. <http://www.iowafarmer.com/corncam/corn/html>

Corn Refiners Association. 1701 Pennsylvania Avenue NW, Suite 950. Washington, DC 20006. <http://www.corn.org>

Grains Nutrition Information Center. Wheat Foods Council. 2002. <http://www.wheatfoods.org>

Kansas Wheat Commission. 2002. <http://www.kswheat.com>

Kid's Field Day: A Virtual Site for Kids to Learn about Agronomy. Kansas State University. 2002. <http://www.oznet.ksu.edu/fieldday/kids/>

King Arthur Flour. Norwich, VT (800) 827-6836. 2002. <http://www.kingarthurfLOUR.com>

National Corn Grower's Association. 2002. <http://www.ncga.com>

National Association of Wheat Growers. 415 Second Street NE, Suite 300, Washington, DC 20002. <http://www.wheatworld.org/>

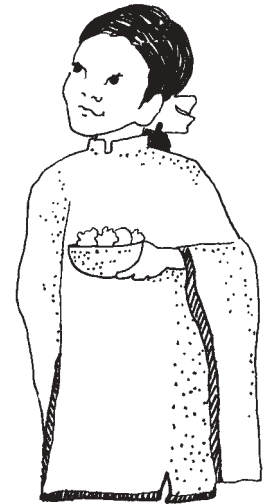
Rice Web. International Rice Research Institute. 2002. <http://www.riceweb.org/>

Rice World. International Rice Research Institute. 2002. <http://www.riceworld.org>

The Wheat Page. Kansas State University. 2002. <http://www.oznet.ksu.edu/wheatpage/>

USA Rice Federation. 2002. <http://www.usarice.com>

EDUCATOR'S NOTES



THE BIG THREE CHART

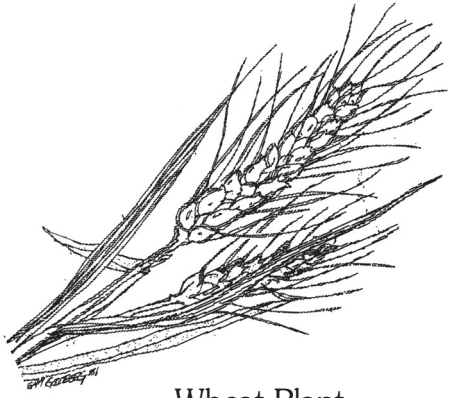
Answer Key

Culture and/or Country or Region	Corn	Rice	Wheat
Chinese	X	steamed buns	X
Indian	X	X	chapati
Eastern European	X	X	bagel
French	X	X	baquette
Irish	X	X	soda bread
Italian	X	X	pizza crust
Mexican	tortillas	X	X
Middle Eastern	X	X	pita
North, Central, and South American Indian	corn bread	X	X
Scottish	X	X	scones

Answers to Special Questions

1. *Rice* 2. *Wheat*

THE BIG THREE GRAINS



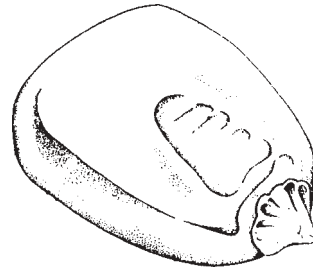
Wheat Plant



Wheat Grain



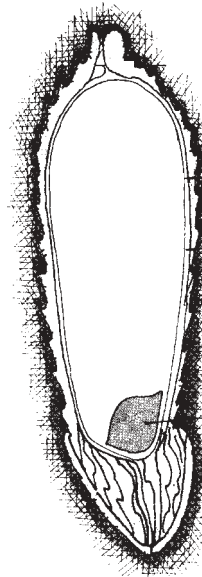
Corn Plant



Corn Grain



Rice Plant



Rice Grain

THE BIG THREE CLUES

Directions: Following are clues for 10 different breads.

1. Read the clues for each bread carefully.
 - a. Identify the culture (or country or region).
 - b. Identify the bread. Some of the clues may include one word that helps you identify the bread. For example, words like pocket or steam provide hints about the name of the bread. In some cases, you may want to compare the 10 bread pictures you cut up with the description of the bread in the clues to help identify the bread.
 - c. When a clue identifies the grain(s) a bread is not made from, place an X in the box. This will help you identify the correct grain for the bread.
 - d. Identify the grain used to make the bread. Some breads are made with more than one of the big three grains, but the one identified for each bread is the main ingredient. Several breads may be made from the same grain. You will need to read the clues for two to three breads before you can identify the grain for each bread. For example, you need all the clues for Bread 1 and Bread 2 before you can identify the grain for each bread. If you cannot identify the grain immediately, read the clues for the next bread or more and return to it.
2. Once you have identified the bread and the grain, glue or tape the picture and name of the bread under the correct grain on **The Big Three Chart**. When finished, you will be comparing your chart with another pair of students.

Bread 1

- This popular Italian round, flat bread began its career as extra bread dough.
- The dough rises one time before it is rolled flat, brushed with oil, and topped with anything you want (e.g., tomato sauce, cheese, meat, vegetables).
- It is not made with corn.
- It is made with the world's largest and most widely cultivated grain.

Bread 2

- This is a very thin bread of Mexico.
- There are numerous ways to eat them including as a taco or enchilada, with butter or plain.
- This flat bread is not made with rice.
- Traditionally, it was not made with the world's largest and most widely cultivated grain.
- It is made with the grain that is second in world grain production.

(If you do not know where to place the pictures for Breads 1 and 2, go back and read the clues carefully.)

Bread 3

- This bread is an ancient heritage from the area at which three continents - Africa, Europe, and Asia - meet.
- The name of the area does not have a beginning or an end and includes a direction.
- Little round breads are formed from the dough and flattened to rise before baking.
- These pocket breads can be filled with any mouth-watering thing to make sandwiches.
- It is made with the same grain as soda bread.

Bread 4

- Round, crusty loaves of this bread are served in Irish country cottages and Dublin hotels alike.
- The chemical leavening agent is baking soda.
- This bread is not made with corn or the same grain as steamed buns.
- It is made with the grain that nourishes more people than any other single food.

- Bread 5
- This bread is the staple of people living in the most populous country in the world.
 - It is made as oblong-shaped buns of steamed dough.
 - When filled, it looks like a little pleated bag with a twisted top.
 - This bread is the only one of these 10 made from this grain.
 - It is made with a grain grown in paddies and served in most Chinese, Japanese and Vietnamese restaurants.
- SPECIAL QUESTION 1: This grain thrives in tropical areas because of the warm, wet climate. Fields planted with this grain are flooded to provide moisture for growing plants and to kill weeds and other pests. It is the world's third-leading grain and the main source of protein for more than half of the people in the world. What grain is it?
-

- Bread 6
- This is the staple bread of a country in Asia with part of the world-famous Himalayan Mountain system and coasts on the Arabian Sea, Bay of Bengal, and Indian Ocean.
 - The dough is kneaded first, then made into balls, and rolled into discs to make flat, round bread or puffy, balloonlike bread.
 - It is served with curries, peanut butter and honey, cheese and tomato, or butter.
 - One-seventh of all farmland around the world grows the grain used to make this bread.
 - It is made with the same grain as pita bread.
-

- Bread 7
- This bread is made in the countries of Eastern Europe.
 - This bread was brought to America as a result of the Polish immigration during the late 1800s.
 - This bread is a boiled and baked roll with a hole in the middle.
 - It was made by hand until 1960 when the first machine was introduced for making this bread.
 - It is not made with the grain that Columbus took back to Spain from America.
 - Like soda bread, it is made with the grain that provides more nourishment than any other single food.
-

- Bread 8
- This bread comes from an English-speaking region north of England on the island of Great Britain. Some of the people who eat the bread may play bagpipes.
 - It is from an island country that does not grow much rice.
 - It is a delight at the breakfast table or for afternoon tea.
 - It is traditionally shaped into a round bun, five to six inches (13-15 cm) across, and cut into four pieces, separated and baked or cooked on a griddle.
- SPECIAL QUESTION 2: People usually make their bread from crops that grow in their own countries. The main grain in U.S. bread baking is the same as used in seven of these breads. What is it? It is also the grain for this bread.
-

- Bread 9
- North, Central, and South American Indians of long ago shaped this bread into a loaf and wrapped it in corn husks or large leaves of available plants before boiling and/or baking.
 - This bread is made with the grain that Columbus took back to Spain from America.
 - American Indians called this grain "maize" and taught the Pilgrims how to plant and cultivate it.
 - It is made with the same grain as the tortilla.
-

- Bread 10
- This bread is served at practically every meal in this large country in western Europe, which has coasts on the Atlantic Ocean, the English Channel, and the Mediterranean Sea.
 - It is a long loaf of crusty bread.
 - It is not made with the grain grown in paddies.
 - Like bagels, it is made with the grain that can be planted in spring or fall.

THE BIG THREE CHART

Names: _____

Directions: Complete this chart using **The Big Three Clues** and the bread pictures.

Culture and/or country or region	Corn	Rice	Wheat
Italy			
Mexico			
Middle East			
Ireland			
China			

THE BIG THREE CHART (page 2)

Culture and/or country or region	Corn	Rice	Wheat
India			
Eastern Europe			
Scotland			
North, Central, and South American Indians			
France			

BREADS AROUND THE WORLD

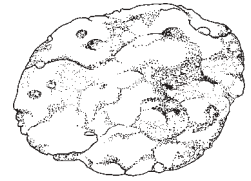
(Cut pictures apart.)



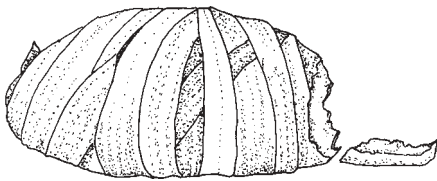
bagel



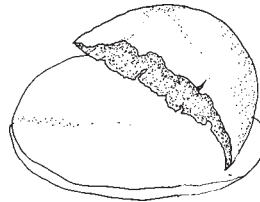
baguette



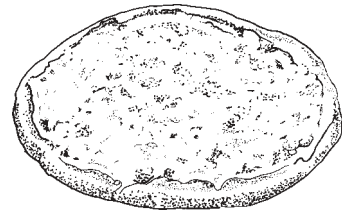
chapati



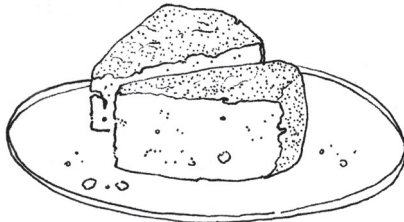
corn bread



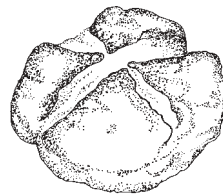
pita



pizza crust



scones



soda bread



steamed buns



tortillas

*There are two spiritual dangers
in not owning a farm.
One is the danger of supposing that
breakfast comes from the grocery,
and the other that heat comes from the furnace.*

Aldo Leopold (1886-1948),
A Sand County Almanac, 1949