

Rice...From Farm To Table

Objective The students will learn about rice and how important it is to Texas and to our daily lives.

Grade Level 1-3 4-6

TEKS:

S- 1.6B; 2.6C; 3.10A	S- 4.10A, 5.10A
SS- 1.9; 2.10	SS- 4.12, 5.13
M- 3.3A; 3.14A	M- 4.1A; 4.4B; 5.3C; 5.13B,C

TAKS: GRADE OBJECTIVES

Reading	3, 4, 5, 6	1, 3
Writing	4	1, 2, 3, 4, 5, 6
Science	5	2, 3, 4
Math	3, 4, 5, 6	1, 2, 5

Assessment Summary:

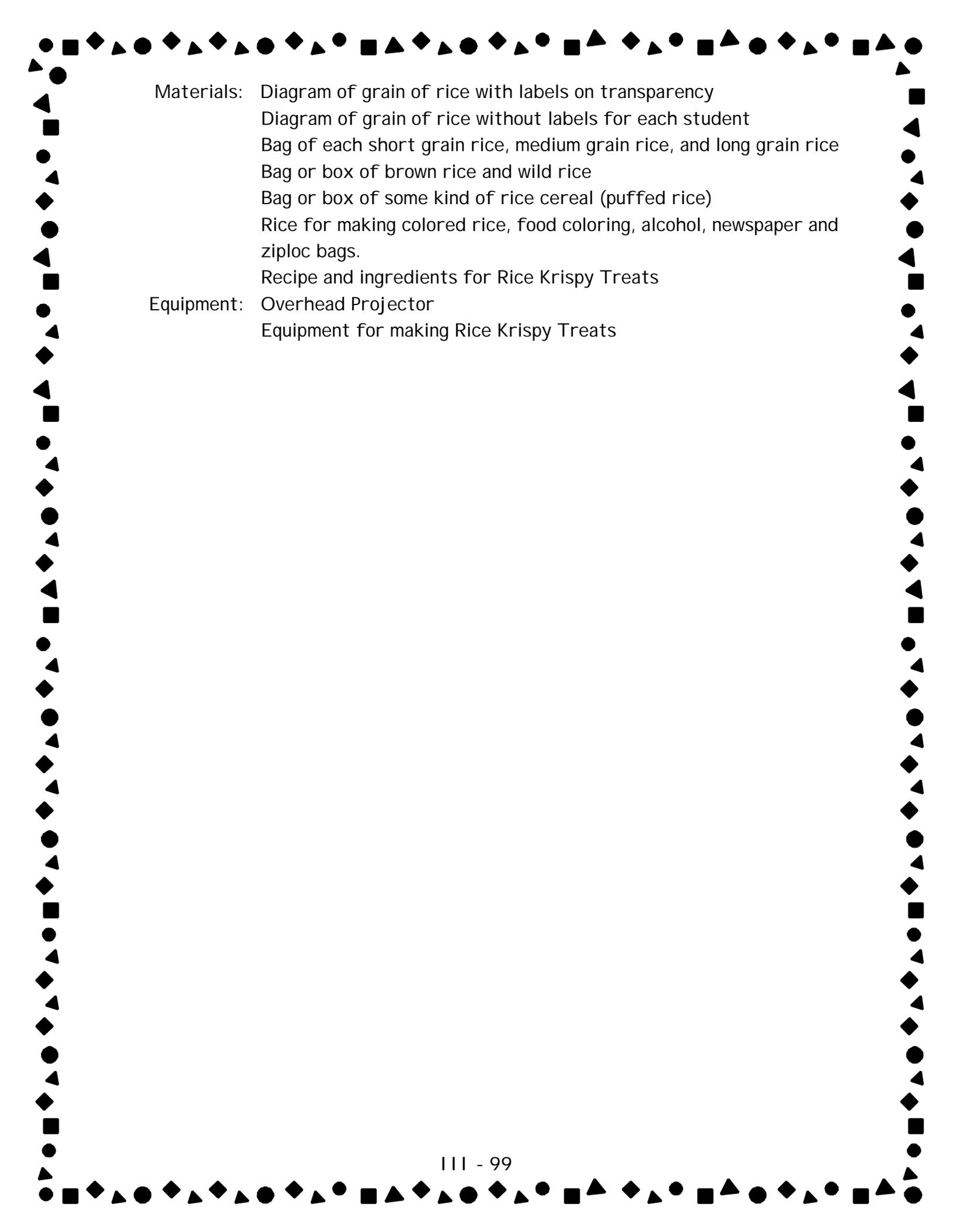
- Objective 1: Students will learn how rice is grown, harvested and processed.
- Objective 2: Students will learn where rice is grown in the U.S. and Texas.
- Objective 3: Students will follow a recipe.

Background Information: National Rice Month is September, you may want to do this lesson then.

Facts about US Rice Pamphlet and Teaching the Fun Way...with Rice!
Both from USA Rice

Websites for:

- USA Rice - www.usarice.com
- Gulf Pacific Rice (Houston) - www.gulfpac.com - info on Texas Rice
- Rivianna Rice (Houston) - www.successrice.com - Rice Trivia under kids' section
- Riceland Foods - www.riceland.com

- 
- A decorative border composed of various black geometric shapes including circles, squares, triangles, and diamonds, arranged in a repeating pattern around the perimeter of the page.
- Materials:
- Diagram of grain of rice with labels on transparency
 - Diagram of grain of rice without labels for each student
 - Bag of each short grain rice, medium grain rice, and long grain rice
 - Bag or box of brown rice and wild rice
 - Bag or box of some kind of rice cereal (puffed rice)
 - Rice for making colored rice, food coloring, alcohol, newspaper and ziploc bags.
 - Recipe and ingredients for Rice Krispy Treats
- Equipment:
- Overhead Projector
 - Equipment for making Rice Krispy Treats

Rice...From Farm To Table

Procedure

1. Introduce new vocabulary:

Grades 1-3

Levee

Combine

Harvest

Mill

Husk

Grades 4-6

Land plane

Sheller

2. Introduce rice by having a bag of rice, and rice cereal, such as Rice Krispies. Tell students that they will be learning about another crop grown in Texas – Rice. Ask how many students have eaten rice? How was it cooked? Make a class graph – Who likes Rice? and Who doesn't like rice?
3. Read the background information Rice...From Farm to Table to your students and discuss the process it takes to turn rice into food. Use additional background material for discussion purposes.
4. Give students a small amount of each of the different types of rice: short grain, medium grain, long grain. Do not tell your students what you are giving them. Have students look at each type of rice under a magnifying glass then have students describe each type. Now, tell them what types of rice you gave them, have them pick out and group the different types of rice.
5. Have students follow the recipe and make Rice Crispy Treats.
6. Activity: Make colored rice with your class to use for rice art. To make colored rice – put a few drops of food coloring and one tablespoon alcohol in a ziploc bag, then put in white uncooked rice. Shake, then put on some newspaper to dry. Make a few different colors. Have students use this rice to make rice art. Give each student a piece of construction paper. Make a design or picture with glue then put rice on the glue.
7. Assessment: Have students complete grade appropriate activities.

Extension

Have students research the history of rice, including the different types, various rice products and uses of rice by-products.

Background Information

Rice...From Farm to Table

Cultivation

American farmers consistently produce a dependable supply of the highest quality rice in the world.

Long gone are the days of ox- and mule-drawn equipment in the marshes of South Carolina. Gone too is the reliance upon seasonal rains, as is still the case in many other rice-producing countries. Rice farming in America has become a precise science, a world of specialized equipment, lasers and computers.

Today, land planes scrape and shift the soil to level the land. Heavy equipment makes light work of building even fields that gently slope, enabling uniform flooding and controlled draining. Laser guidance systems determine where water control levees will be placed.



In early spring, acres of seeds are quickly planted to an exact depth by grain drills, or cast over dry or flooded fields by airplane. Gravity guides fresh water, pumped from deep wells, nearby rivers, canals or reservoirs to provide a constant water depth on the field of 2 to 3 inches during the growing season. And, to ensure a consistent and healthy crop, fertilizers are evenly applied from the air.



When the rice is mature, the water is drained from the fields. Sophisticated combines cut the rice, separating the grain from the stalk, and funnel it into trucks for transporting to dryers. At large commercial installations or small drying facilities on the farm, forced warm, dry air gradually removes moisture from the grain to the level suitable for storage. When sold, the rice will be transported to a rice mill.



Milling

When rice arrives at the mill, it is ushered through a series of sorting machines, separating the kernels, encased in an inedible hull or husk, from any debris. The rice is then sent on its way through the multifaceted processing journey.

The rough rice passes through "sheller" machines that remove the hull. What remains is brown rice, with the bran layers still surrounding the kernel. The grains of brown rice are milled by machines that rub the grains together under pressure. This abrasion removes the bran layer, revealing white or "polished" rice. Some American mills produce parboiled rice, favored by those who desire rice that is an extra separate, firmer grain when cooked. Parboiling is a steam pressure process in which rough rice is soaked, steamed and dried before milling. Milled white rice, at its best, is made up of clean, polished, whole kernels. Many U.S. rice mills use laser sorters that look for broken or discolored kernels and sort them from the whole kernels of rice.

Technology has enabled the U.S. rice industry to consistently produce a high-quality product. The modern technology employed by American rice producers is, in part, responsible for the reputation for quality U.S. rice has around the world. The fact that the U.S. is one of the world's largest exporters of rice attests to its broad appeal. An equally impressive fact is that more than 90 percent of the rice consumed in the U.S. is produced within its borders.



Additional Information

Types Of Rice

Worldwide there are more than 40,000 different varieties of rice, though only a small number offer the quality acceptable to be grown commercially in the U.S. In the United States there are only a few varieties grown, and these can be divided into long, medium, and short grain. Limited waxy rice is produced as well as some aromatic varieties.

The primary difference in these rices is their cooking characteristics, and, in some cases, a subtle flavor difference. From the nutritional standpoint, they are equal, and indeed can often (with the exception of arborio and waxy rice) be interchanged in recipes.

Long

Long grain rice has a long, slender kernel, four to five times longer than its width. Cooked grains are separate, light and fluffy.

Medium

Medium grain rice has a shorter, wider kernel (two to three times longer than its width) than long grain rice. Cooked grains are more moist and tender, and have a greater tendency to cling together than long grain.

Short

Short grain rice has a short, plump, almost round kernel. Cooked grains are soft and cling together.

Forms

The influx of convenience foods has brought consumers rice in bags, cans and cartons. Rice can be purchased cooked or uncooked, canned, dehydrated and also frozen. Few foods are packaged so extensively and are offered in so many combinations as rice. To meet the many special requirements of packaged foods, rice undergoes varying degrees of processing, including regular-milled, parboiled, precooked, and brown.

Rough (Paddy) Rice

Kernels still within the hull. Before the rice can be packaged or cooked, the outer hull or husk must be removed.

Brown Rice

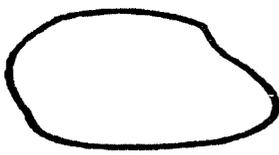
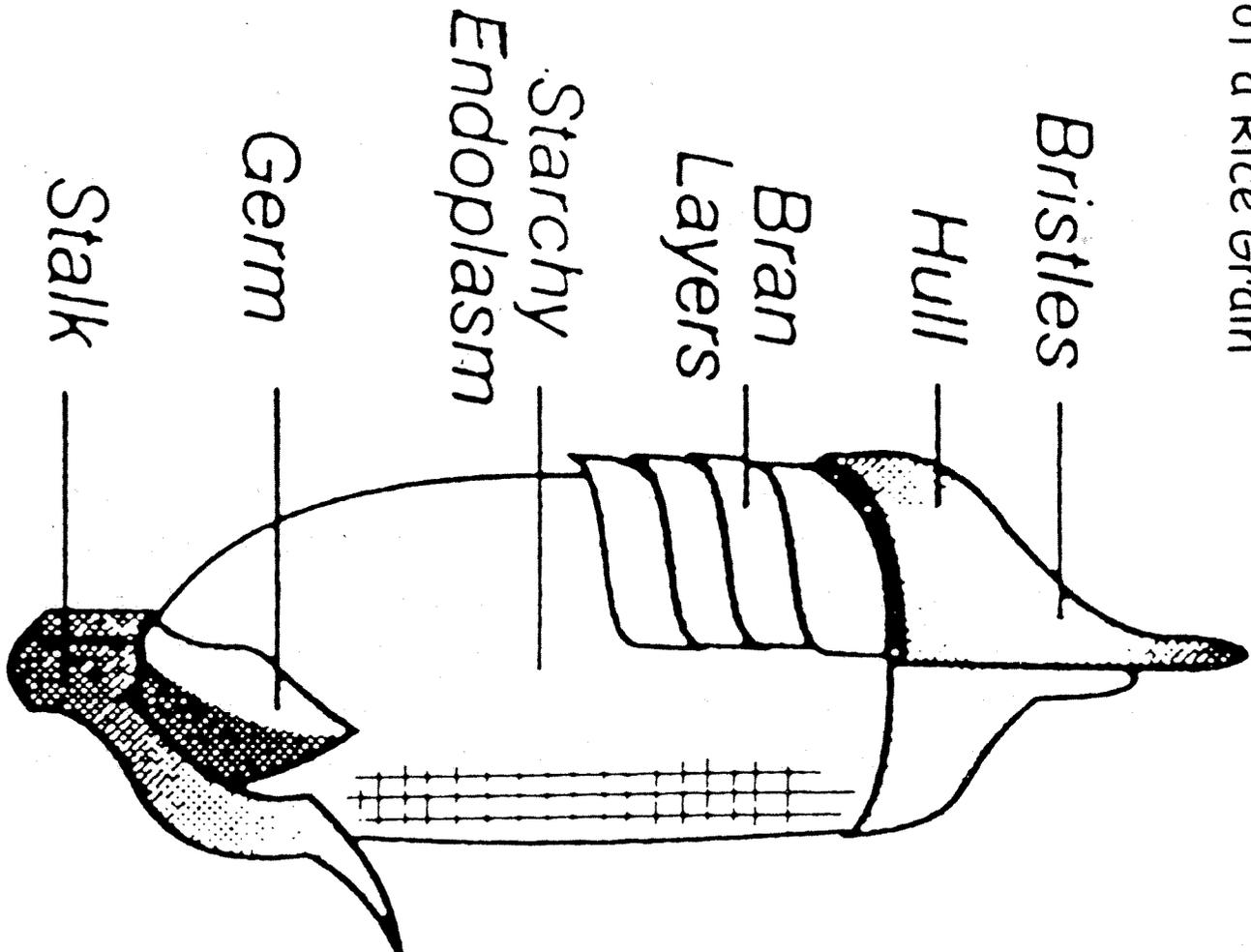
Kernels of rice from which only the hull has been removed. Brown rice may be eaten as is or milled into white rice. Cooked brown rice has a slightly chewy texture and a nut-like flavor. The light brown color of brown rice is caused by the presence of bran layers which are rich in minerals and vitamins, especially the B-complex group.

Regular-Milled White Rice

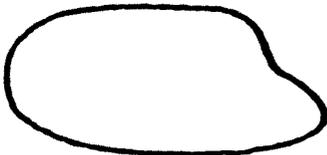
Rice that has the hull and bran layers removed. It is sometimes called milled rice, milled white rice, polished or polished white rice. The hulls, bran layers and germ have all been removed. Most white rice is enriched, giving it a nutritional value similar to brown rice.

Photos and Text Courtesy of USA Rice Federation

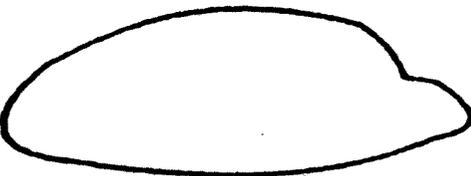
Parts of a Rice Grain



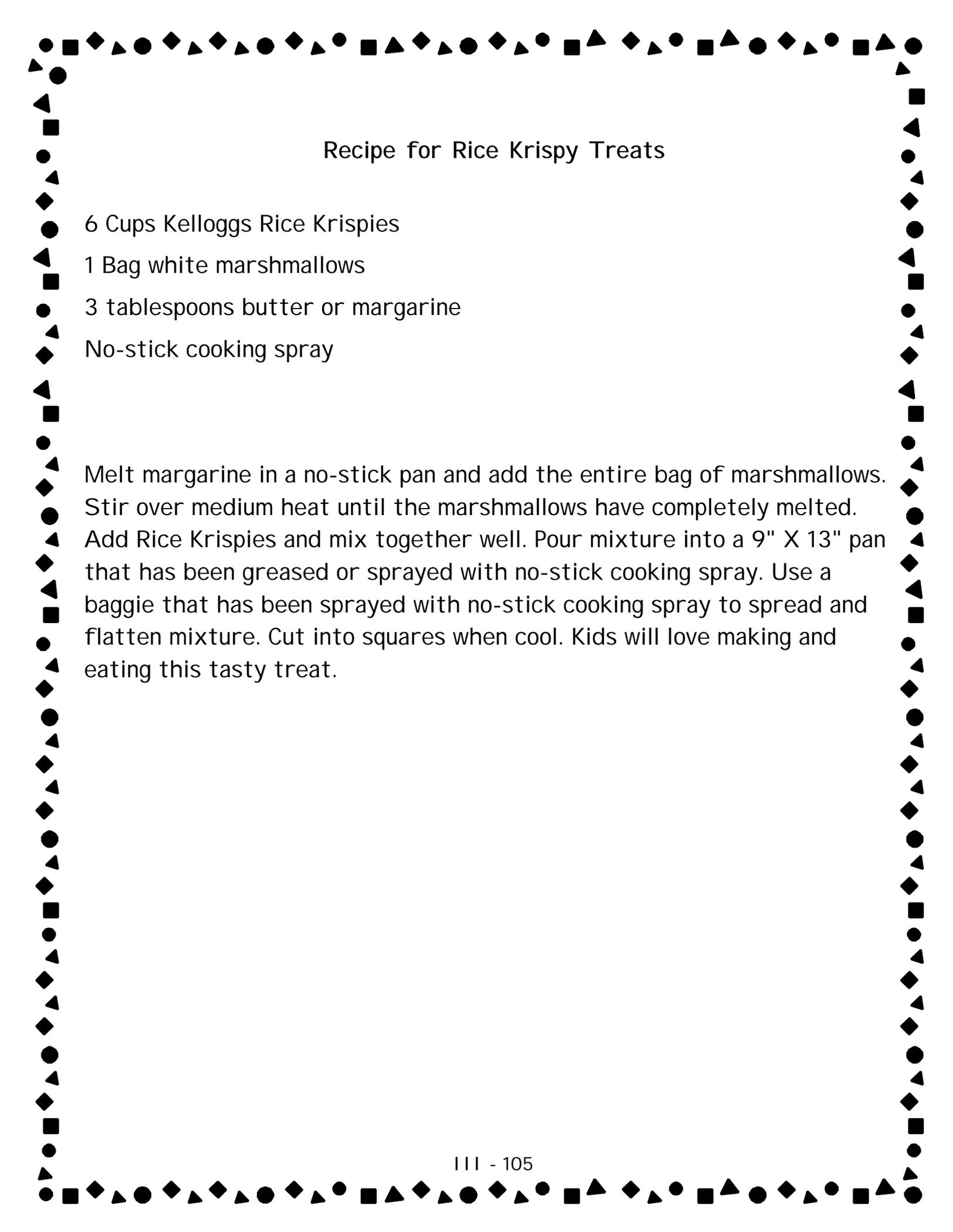
Short Grain



Medium Grain



Long Grain

A decorative border composed of various black geometric shapes including circles, squares, triangles, and diamonds, arranged in a repeating pattern around the perimeter of the page.

Recipe for Rice Krispy Treats

6 Cups Kelloggs Rice Krispies

1 Bag white marshmallows

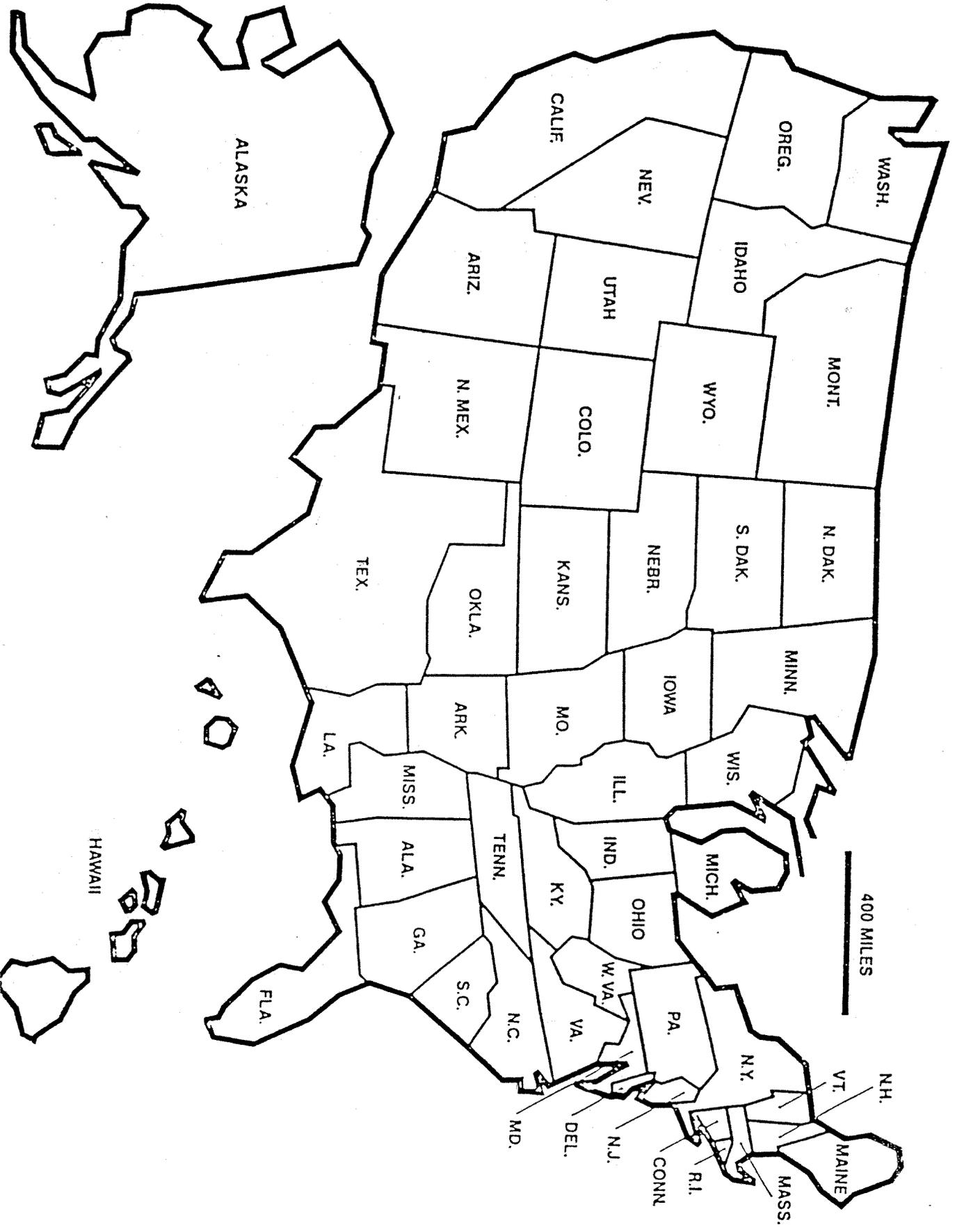
3 tablespoons butter or margarine

No-stick cooking spray

Melt margarine in a no-stick pan and add the entire bag of marshmallows. Stir over medium heat until the marshmallows have completely melted. Add Rice Krispies and mix together well. Pour mixture into a 9" X 13" pan that has been greased or sprayed with no-stick cooking spray. Use a baggie that has been sprayed with no-stick cooking spray to spread and flatten mixture. Cut into squares when cool. Kids will love making and eating this tasty treat.

U.S. Rice Production

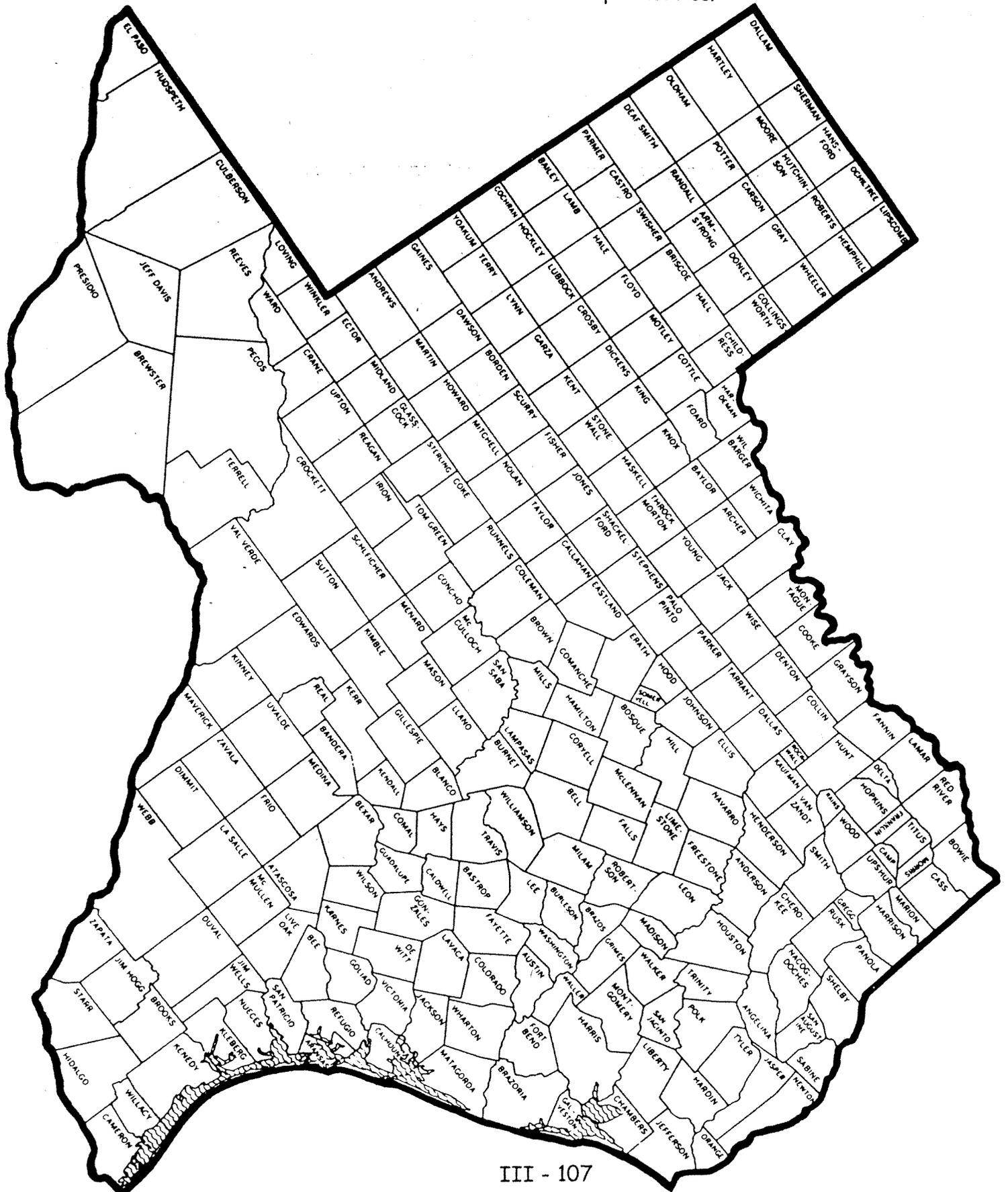
Six states in the United States produce rice. They are ranked as follows: Arkansas, California, Louisiana, Texas, Mississippi and Missouri. On the U.S. Map locate and color the six rice producing states.



Rice in Texas

Rice is primarily grown in Southeast Texas, along the Gulf Coast. The 10 counties in Texas that produce the most rice are: Wharton, Colorado, Matagorda, Brazoria, Jackson, Jefferson, Chambers, Liberty, Fort Bend, and Waller.

On the Texas map locate and color the 10 Texas Counties that produce rice.



Rice Harvest Math

1. Finish this chart by figuring out how many 100 pound bags of rice were harvested from each acre. (Hint: Divide the number of bags harvested by the number of acres harvested.)

Year	Acres Harvested	Bags	Bags Per Acre
1950	481 thousand	11.5 million	
1960	417 thousand	12.7 million	
1970	467 thousand	20.8 million	
1980	586 thousand	24.8 million	
1990	353 thousand	21.2 million	
1997	159 thousand	14.2 million	

2. Use the information above to make bar graphs on the next page. Use map colors or crayons to make your bar graphs.

3. In what year were the most acres of rice harvested? _____

4. In what year were the fewest acres of rice harvested? _____

5. In what year were the most bags of rice harvested? _____

6. In what year were the fewest bags of rice harvested? _____

7. In what year did farmers produce the most bags per acre? _____

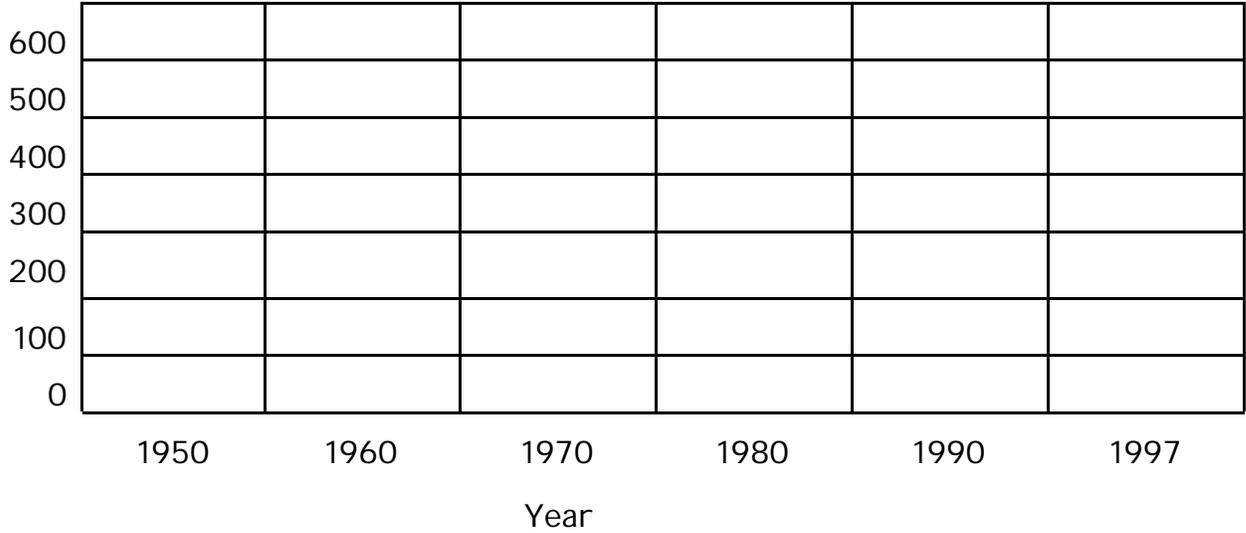
8. In what year did farmers produce the fewest bags per acre? _____

Rice Harvest Graphing Activity

Using the information from Rice Harvest math complete the following graphs.

Acres of Rice Harvested

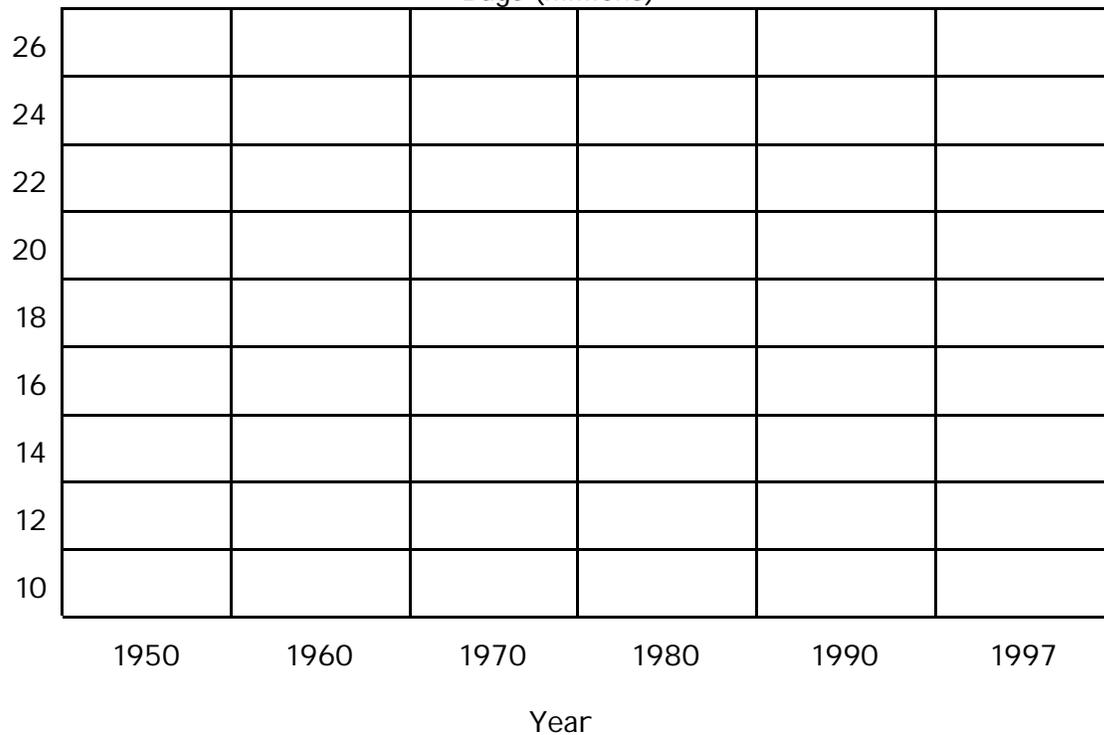
Acres (thousands)



Farmers measure the rice they harvest in hundred pounds or cwt. (CWT means hundred weight.) One bag of rice weighs one hundred pounds. Using the information in Rice Harvest Math graph the number of bags harvested in each year. For extra credit calculate how many tons of rice were harvested each year. (One ton = 2000 pounds.)

Bags Harvested

Bags (millions)



ANSWER KEY

Rice Harvest Math

1. 1950	23.9	575,000 tons
1960	30.5	635,000 tons
1970	44.5	1,040,000 tons
1980	42.3	1,240,000 tons
1990	60	1,060,000 tons
1997	89.3	710,000 tons

2. Check for accuracy

3. 1980

4. 1997

5. 1980

6. 1950

7. 1997

8. 1950