Rice

*Lesson Plan for Grade , Science*

*Prepared by NAITC*

*Modified by Mississippi State University, School of Human Sciences*

*for Mississippi Farm Bureau Federation - AITC*

# OVERVIEW & PURPOSE

Students will learn about the cultivation and parts of rice while also covering subjects including mathematics, economics, and geography. Activities include removing the hull, bran, and germ from grains of rice.

# EDUCATION STANDARDS

**Mississippi College-and-Career Readiness Standards:**

E.4.2 Evaluate how geographic and economic factors influence life and work in Mississippi. Compare the resources and scarcity of resources in a local region to other regions of Mississippi (e.g., Delta’s rich soil vs. coastal waters). 2. Describe the division of labor within Mississippi (e.g., government, industry, and agriculture). 3. Identify the opportunity cost of choices made within Mississippi (e.g., cotton farming vs. soybean farming, pasture land vs. industrial development, beaches vs. casinos, landfills vs. parks, etc.).

ELA-W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information and provide a list of sources.

**NALOs:**

T5.3-5 a Describe how supply and demand impact the price of agricultural goods.

# OBJECTIVES

* Students will analyze the parts of the world where rice is grown and cultivated
* Students will construct a rice paddy farm
* Student will justify why rice is grown in certain parts of the world

# MATERIALS NEEDED

* World wall map (1)
* Sticky notes, 1 per student
* Teacher Background Agricultural Connections information from this lesson (included in the lesson 1 per student)
* Rice Paddy Images (1 set)
* Reflection Sheet (1 per student)

### Essential Files (maps, charts, pictures, or documents)

* [Rice Examples Page](https://drive.google.com/file/d/1bvx36X58vDo99u0eztrZ61rMTf4FR_8a/view?usp=drive_link)
* [Rice Paddy Images](https://drive.google.com/file/d/1dOXC7aQrTFBOq9r0yZrVVlm30p6PD4sL/view?usp=drive_link)

# Lesson Set Up:

1. Print the reflection sheet (1 per student).
2. Display the world map for the class to see.
3. Optional: Launch the [*Build a Rice Paddy*](http://www.pbs.org/wgbh/nova/ancient/rice-paddy.html)*,* for the students to complete on desktop computers.
4. Display the rice paddy images.

# Vocabulary

**brown rice:** whole grain rice from which the inedible hull has been removed, but which still has the germ and outer layers of bran

**regions:** areas of Earth’s surface that have unifying physical and/or human characteristics

**rough rice:** unprocessed rice still in the hull as it comes from the field, also known as paddy rice

**staple food:** a food that is eaten regularly and is a dominant part of the diet, supplying a major proportion of energy and nutrient needs

**white rice:** rice from which the inedible hull, germ, and outer layers of bran have been removed

# Ag Facts:

* Rice farming is about 10,000 years old.
* Thousands of varieties of rice are farmed.
* Rice is the primary staple food for more than half of the people on Earth.
* *Toyota* means bountiful rice field. *Honda* means the main rice field.

# Background Information for Teacher:

Rice is the primary **staple food** for more than half of the people in the world, and it is grown on every continent except Antarctica. Most of the world’s rice is grown and eaten in Asia. China, India, and Indonesia are three of the top rice-producing countries in the world. Rice is also an important crop in Latin America and Africa, where Argentina, Brazil, Colombia, Madagascar, Nigeria, and Tanzania are important rice-producing countries.

There are four major **regions** of US rice production: the Arkansas Grand Prairie, the Mississippi Delta, the Gulf Coast, and the Sacramento Valley of California. Nearly all of the rice grown in the United States comes from six states: Arkansas, California, Louisiana, Mississippi, Missouri, and Texas.2 The United States produces less than 2% of the world’s rice but is a major exporter, contributing more than 10% of the rice that is globally traded. About half of all rice grown in this country is exported. The United States also imports some rice from other countries. Nonetheless, more than 80% of the rice used in the United States is grown by US farmers.

The United States has the world’s highest yielding rice farms due to the wide availability of irrigation and advanced technology. Rice fields are leveled using computerized, laser-guided land-leveling equipment to make sure the flooded field or “rice paddy” is perfectly flat. Seeds are planted in early spring to an exact depth by grain drills pulled behind a tractor or cast over dry or flooded fields by airplane. Fields are flooded between March and May, depending on the region. Flooded rice fields provide important wetland habitat for hundreds of species of birds, mammals, and amphibians. Recirculating irrigation systems have allowed farmers to maximize yields and reduce the amount of water required by over one-third in the last 30 years.4 Between September and November, the rice is mature and ready for harvest. The fields are drained, and then the rice is harvested using combines. The rice heads are removed, and the rice stem or straw is left. The straw is cut and baled later, just like wheat, barley, and oat straw. The rice, called **rough rice** at this point, is then transported to a dryer where moisture is slowly removed from each grain. Finally, the rough rice is sent to a mill for processing.

The rough rice is first milled using a rice huller to remove the chaff (the outer husks or hulls of the grain); this creates **brown rice**. This process may be continued, removing the germ and the brown outer layers, which are called bran, to create **white rice**. Rice, both brown and white, is grouped by size: long, medium, or short grain. Short grain rice tends to be sticky, while long grain rice remains separate and is light and fluffy after cooking. Rice is used in breakfast cereals, baby food, rice cakes, beverages, and as table rice.

It is believed that rice was first cultivated in ancient Asia and from there spread to Africa and Europe. Rice was later introduced to South and North America and Australia with the advent of sea voyage. Rice farming in California began in the early 1900s, mainly in response to the increasing Chinese population during the Gold Rush.

Rice is the world’s second or third largest crop, behind maize (corn) and sometimes wheat.vRice cultivation is well suited to countries and regions with low labor costs and high rainfall, as it is very labor-intensive to cultivate without expensive machinery and requires plenty of water. Rice is a nutritious, affordable source of carbohydrates and is packed with vitamins and minerals. It includes thiamin, riboflavin, niacin, phosphorus, iron, and potassium, and is an excellent source of amino acids. Only a trace amount of fat is found in either brown or white rice. Brown rice is a good source of fiber and is part of a solid foundation for a healthy diet.

# LEARNING PROCEDURES

### Interest Approach:

1. Ask students to name all the places in the world that grow rice. On a large wall map of the world, place a sticky-note on the countries where students have said rice grows.
2. Tell students that you will return to the map later, but now it's time for a story.

### Procedures

Activity 1: Geography of Rice

1. Looking at the world map and the sticky notes where students guessed rice is grown, read the first two paragraphs in the *Background Information* section aloud to the class.
2. Add sticky notes to the wall map where needed (note that rice is grown in many countries and only the most prominent are mentioned here). Ask students if they can think of anything these rice-growing regions have in common. *(They have wet, warm climates; they are found at middle latitudes that are not too far north or too far south.)*
3. Explain to students that rice needs a long, warm growing season and lots of water. Rice can even grow in standing water, so rice farmers often flood their fields. Flooding rice fields ensures that the rice has plenty of water and prevents most weeds from growing. The flooded fields are drained and allowed to dry when it is time to harvest the rice.
4. Share and discuss the *Rice Paddy Images* with students. In order to flood rice paddies, they must be enclosed around the edges to hold water. In hilly areas rice fields are terraced, creating level areas that can hold water. Discuss the difference between harvesting with a tractor and harvesting by hand. You may also wish to share the NOVA interactive presentation [*Build a Rice Paddy*](http://www.pbs.org/wgbh/nova/ancient/rice-paddy.html)*,* which illustrates how land is terraced for rice cultivation.
5. Use the following discussion questions to further explore the geography of rice:
   * How long have people been growing rice? *(Approximately 10,000 years)*
   * Where do you think rice was first cultivated? *(Scientists have found evidence of ancient rice cultivation in several different locations in Asia. It's likely that rice farming was developed simultaneously by different ancient civilizations in Asia.)*
   * What do you think rice farming was like thousands of years ago? *(Although tractors are a recent invention, people have been modifying the movement of water and the shape of the land to grow rice for thousands of years. Without engines, people used the power of flowing water, human labor, and animal strength to move materials, plow fields, and weed and harvest crops.)*
   * Do you think rice was as important to ancient civilizations as it is to people today? *(Rice was a foundational crop for ancient civilizations in India and China. The development of civilization went hand-in-hand with the development of agriculture.)*
   * What geographic features might be important to a civilization that depends on growing its own rice as a staple food? *(There are many, for example: latitude and altitude (both affect the length of the growing season), the quality of the soil for fertility and for holding water (clay soils hold water, while sandy soils allow water to drain quickly), the presence of rivers to provide irrigation water, etc.)*

**Concept Elaboration and Evaluation**

* After conducting these activities, review and summarize the following key concepts by having students complete the reflection sheet.

# Additional Learning Procedures

To help students review and elaborate more about rice, try using the [“The Carousel”](https://drive.google.com/file/d/1RHaHTMxIT85w3vrCg82BtRBd20PsC1iO/view?usp=drive_link) method to allow students to think deeper and make new connections.

Additional Text to Include:

[Mama Provi and the Pot of Rice](https://www.agfoundation.org/recommended-pubs/mama-provi-and-the-pot-of-rice)

[The Great Grains Group](https://www.agfoundation.org/recommended-pubs/the-great-grains-group)

[Grains](https://www.agfoundation.org/recommended-pubs/grains)

Source: <https://www.agclassroom.org/teacher/matrix/>

*For more information and additional lessons visit*

*https://msfb.org/ag-in-the-classroom/lesson-plans/.*