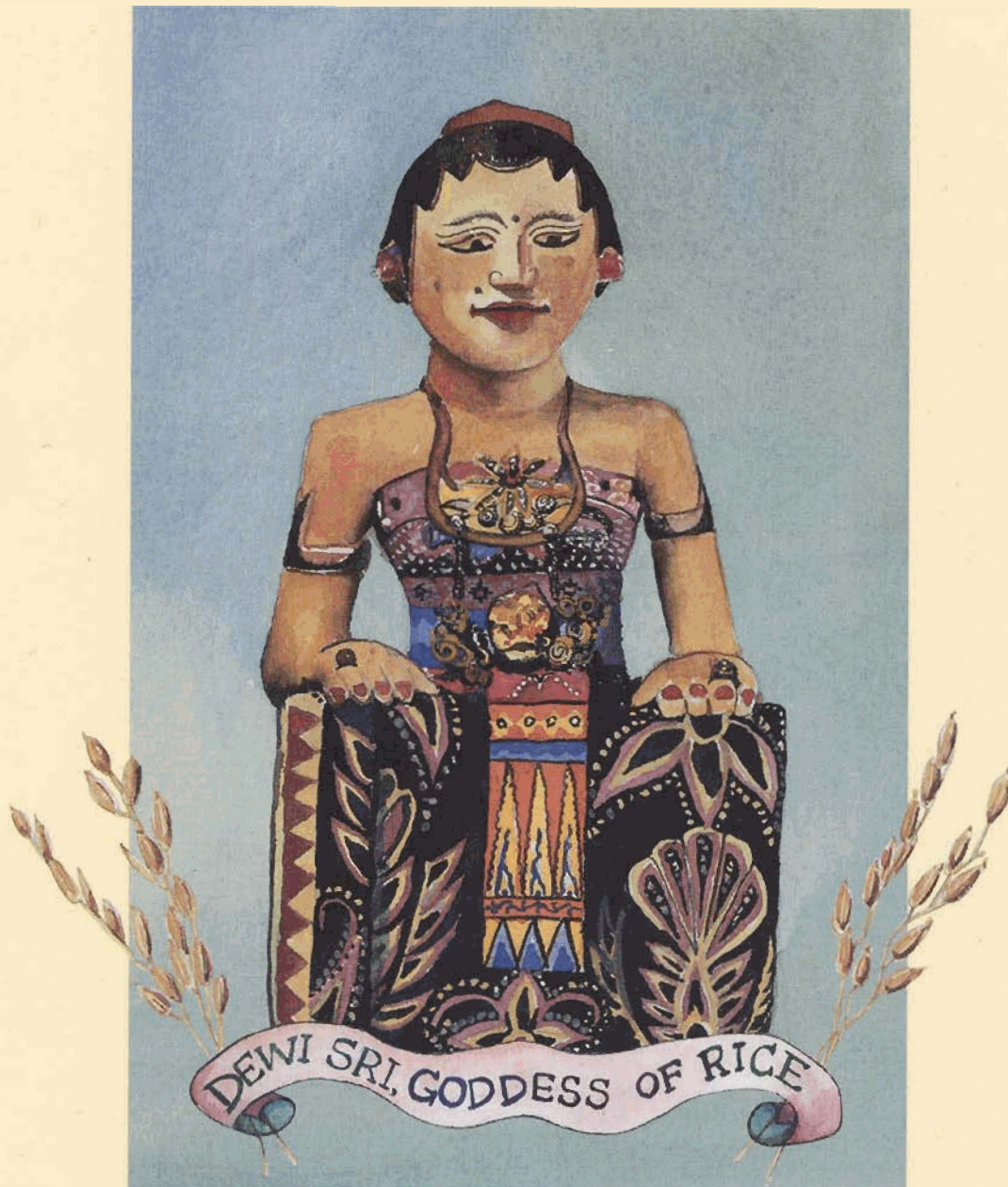


Rice

Grain of the Ancients

Marcia Eames-Sheavly

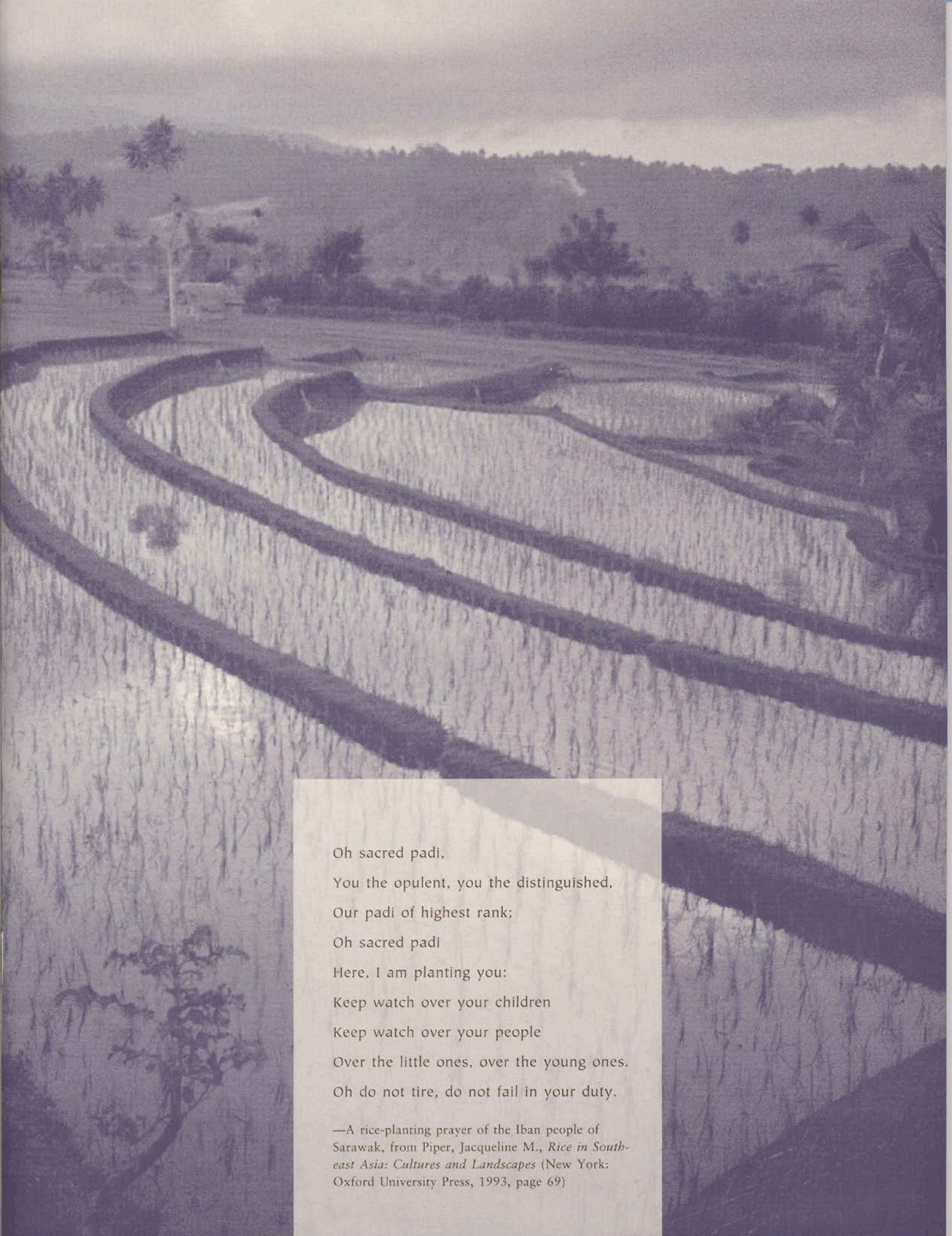


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Cover: Adapted from an image in Richter, Anne, *Arts and Crafts of Indonesia* (San Francisco: Chronicle Books, 1993, page 56)

Photo of rice paddy on page 1 courtesy of David Poland.



Oh sacred padi,
You the opulent, you the distinguished,
Our padi of highest rank;
Oh sacred padi
Here, I am planting you:
Keep watch over your children
Keep watch over your people
Over the little ones, over the young ones.
Oh do not tire, do not fail in your duty.

—A rice-planting prayer of the Iban people of Sarawak, from Piper, Jacqueline M., *Rice in Southeast Asia: Cultures and Landscapes* (New York: Oxford University Press, 1993, page 69)

Can you imagine talking to a plant as you place it respectfully into your garden? Can you imagine going hungry if that plant were never to set seed? What if all your celebrations and ceremonies and all your meals revolved around that very same plant? Can you imagine having to be properly dressed when handling the plant, never stepping over it for fear of something bad happening, never spilling a single seed of it, treating it as your mother or your child, and dancing after its harvest? This is the way many of the traditional peoples of Southeast Asia treat the rice plant.

Rice is the crop that supports the most densely populated regions of the world. Although more wheat is produced in the world each year than any other crop, more people eat rice. In fact, more than 50 percent of the world's people depend on rice as a staple food.

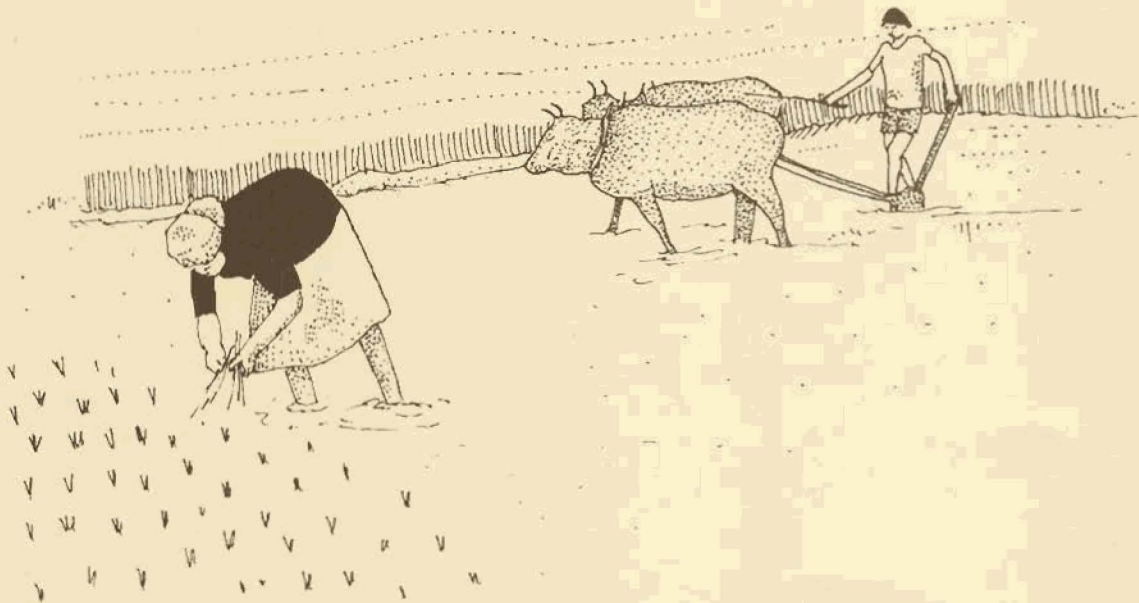
The project *Rice—Grain of the Ancients* explores rice growing through the letters of an imaginary pen pal named Lanlan Chen in northern China. By reading her stories and the stories and poems of others and by doing the activities, you will get to know more about rice and come to understand why it is so important to the people of Southeast Asia.

Note to the Leader

The project *Rice—Grain of the Ancients* is a fun way for children ages nine to twelve to learn about rice in informal groups such as in nature centers or science museums or 4-H clubs. Schools with a gardening program will find this unique interdisciplinary project a great way to cover social studies, science, creative arts, geography, and nutrition. The activities can be modified for older or younger children.

This project was reviewed by many individuals throughout New York State and field tested in several different educational settings. The multidisciplinary nature of the project and its stories appealed to the adults, while the food- and craft-related activities piqued the interest of the young people.

Some groups may choose to focus more on the sociocultural aspects of the project. If this is the case, you may want to check out from your library some additional material on the geography of Southeast Asia, stories and poems written by Asian authors, or materials about other aspects of life in the "rice bowl." There is so much to discover!



As you read the letters from Lanlan Chen, keep in mind the following questions:

- How is Lanlan's life like yours? How is it different?
- What do all the celebrations in her village have in common?
- Compared with young people in the United States, how does Lanlan spend much of her time?
- In the epilogue, Lanlan hints at some changes in her life. What similar issues is our country struggling with?

◆ Please keep in mind as you read Lanlan's stories that Lanlan describes the exception rather than the rule for major rice-growing regions. Most rice is grown in areas in the world where winter is virtually never cold enough to result in frost, let alone frozen waterways. Lanlan's part of China actually relies on wheat as a staple food. In most places where rice is grown, people can grow two or three crops in a single year. The rhythm of farming is different under these circumstances, but the intensity of reverence for the crop is the same.

Review and Select Activities

The project *Rice—Grain of the Ancients* includes nine suggested activities. Read through them in advance to decide which are best for your group. Supplies for each activity are listed. Most are inexpensive and readily available.

One of the first questions associated with this project is, "Can I really grow rice in the northern United States?" The rice-growing region of Asia covers a wide geographical area, and different types of rice are suited to different regions. Although rice growing in the United States is concentrated in the South, and though it may be challenging to raise rice commercially in the North, you can easily plant a small paddy outdoors by using rice that is suited to your region. You can also raise rice in pots indoors. Rice that is well suited for this use can be ordered through Cornell University in Ithaca, N.Y. (see "References and Resources").



The scholar precedes the peasant, but when the rice runs out, it's the peasant who precedes the scholar.

—Vietnamese proverb, from Piper, Jacqueline M., *Rice in Southeast Asia: Cultures and Landscapes* (New York: Oxford University Press, 1993, page 41)

Spring 1974

Hebei Province, North China

Dear friend,

I am Lanlan Chen. Lanlan (you would say LAHN-lahn) means "magnolia." I am from the Hebei Province, which is on a bay in North China (you can find it on your map). My family grows rice near the seashore. On a clear day, we can see the boats on the sea! My grandfather and my father are also fishermen. They spend about one-half of the year on the boats—all the strong men and boys do. They know about the fish-harvesting season, they know about the jellyfish, they even know about the whales and sharks. The big boats are out at sea for a half year at a time, but the small boats run back and forth more often. Whenever the boats go out, we celebrate. Whenever they come in, we celebrate! We are thankful for the fishing.

The women and children do not fish. We stay at home, work and sing together, make the nets, run the schools, design clothes, cook.... But I am getting sidetracked. Didn't you want to know about rice for your school project? The women are the main rice growers. I will tell you about the rice, season by season.

Today it was windy. It was so windy that it was hard to walk to school! I am writing this during my lunchtime. I come home from school each day for a two-hour lunch, along with my younger brother and older sister. We noticed today that the ice is breaking up with the warmer weather. We started collecting wild greens this week, as we always do in early March. They do not taste very good, but they are very good for us. We do not buy greens—we always collect them from the wild. In fact, we do not buy very many things. We make, grow, or reuse most *everything*. And I know you think I will never get to the part about the rice!

At about the same time the wild greens are being collected, we begin to smooth the land to make the rice fields. In the southern part of China, the rice growers use water buffaloes to help them, but here we use horses. The land is graded so that it is flat. The fields are square sections located between channels of water. There is one high spot in our village. I love to go there and look down on the fields. To me, they look like beautiful chessboards.

After the fields are graded, we make the seedbeds. The soil for this must be very good. We make fences with dried corn or sorghum stems, and these protect the small rice plants from the wind. Everyone in the village works together because this is a busy time. We plant the rice in the seedbeds, all by hand. Since the seedbeds need to be kept wet, it seems as if we are walking in mud for days!

After planting, we cover the seedbeds with plastic each night to warm the soil, and each day we remove the plastic. We do this for about three weeks because our early spring nights are so cold! (By the way, plastic is one of the only things that we buy. We used to cover the seedbeds with rice straw, but it didn't work as well.)

After the rice plants are about three weeks old, transplanting begins. This is one of the hardest jobs that we do all year. The women and girls pull the small rice plants by hand, bundle them, and tie them with rice stems. A wagon pulls the bundles of tiny plants to a field that has already been graded for planting.

The fields for transplanting—called paddies—are flooded with water, so we wear rubber pants up to our waists. Have you ever planted anything in cold water for days at a time? It is such hard work. But we sing songs, and there is a feeling of celebration in the air. The folk songs help to get rid of the sleepiness. Perhaps that is why the songs are so cheerful!

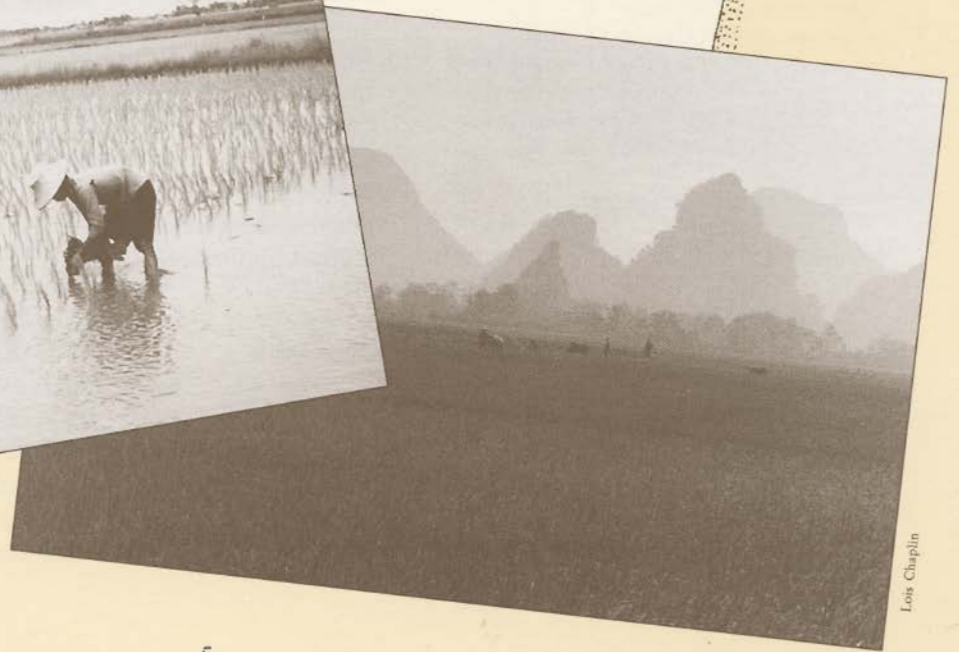
We form lines, about 100 meters long. We all walk together in one direction, each of us planting. A small boat carries the tiny plants along the paddies that we are planting. We each plant six rows of rice, two on each side, and two rows between our legs. The men throw us bundles of small plants as soon as we run out so that we never have to break our rhythm.

Our knees hurt and our backs hurt, but this is a happy time. The rice fills our stomachs during the long year, and we are grateful. And besides, I am a very fast planter! But enough for now. My sister is calling me. Write to me when you can! I would like to know about you too.

Your pen pal,

陳兰兰

Lanlan Chen



Lois Chaplin

The History of Rice Cultivation

No one really knows for sure exactly where rice cultivation began, although we do know that it was in Asia. Rice has been cultivated in Southeast Asia for about 7,000 years or more. Evidence points to India, southern China, or somewhere in Southeast Asia as the most likely point of origin.

Rice is just about the only food eaten by the poorer people of Southeast Asia during times of hardship, and it is the basis of almost all cultures there. Rice is so adaptable that it has made farming possible in areas where other crops cannot be grown. You can find rice in the swampiest valleys, in forests, on terraced mountainsides, and on hot, dry land.

The connection between rice and the people of Southeast Asia is powerful. Rice is often associated in Eastern cultures with abundance and fertility; it is the symbol of long life and happiness. Disrespect for rice is thought to have horrible consequences. For example, some people in Japan believe that rice is so sacred that leaving a single grain in a rice bowl could cause blindness.

Rice was first reported in Europe during the time of Alexander the Great, around 2,300 years ago. Rice growing spread through the Middle East, into Egypt, and throughout the world from there. It became a very important crop in Africa. Rice cultivation in the United States dates from the mid-1600s. It arrived here on ships from Africa and was first raised in the colony of South Carolina.

Today, more than 100 countries throughout the world grow rice. They include all Asian countries, most countries of West and North Africa, some countries of Central and East Africa, most of the South and Central American countries, Australia, and four U.S. states.

Why do you think that people in our culture throw rice at newlyweds?



In Vietnam, it is believed that parents must never punish a child while he or she is eating rice, no matter what the child has done, because that would disrupt the sacred communion between the rice eater and rice maker. Consequently, many children there learn to eat really slowly!

—From Hayslip, Le Ly, *When Heaven and Earth Changed Places: A Vietnamese Woman's Journey from War to Peace* (New York: Doubleday, 1989, page 9)

Activity: Find the Rice-Growing Regions of Asia

Supplies Needed

A world map

- Because rice cultivation began in or near **India**, many rice types have found their way to this country. Rice is involved in many aspects of life, including naming ceremonies for children. In these ceremonies, rice is offered to the child by family members and friends as a token of best wishes. The ancient Indian term for rice, *dhanya*, means “sustainer of the human race.” Ancient Hindu scriptures mention rice, and all offerings to God were given as rice. Place a #1 on India.

- A meal in **Bangladesh** always includes rice. In fact, in Bengali, the language spoken by the people of Bangladesh, the word for eating a meal is literally “having rice.” Find Bangladesh, and mark it with a B.

- In **China**, rice is never wasted. Children are taught to eat every last grain in their rice bowls. In southern China prayers are offered before rice is planted. The Chinese term for rice, *dao*, sounds like the same Chinese word that means “the road” or “the way.” People in this region often greet each other by saying, “Have you eaten your rice today?” Place a C on China.

- Rice cultivation in **Japan** is believed to have begun about 2,900 years ago. In Japan the three daily meals are *asa gohan*, *hiru gohan*, and *yoru gohan*, which translate, respectively, to morning rice, afternoon rice, and evening rice. A popular beverage is rice wine. Find Japan on the map, and mark it with a J.

- As in the countries mentioned above, no meal in **Indonesia** is complete without rice. Indonesia has claimed to be the land of origin of rice. The name of the Indonesian island Java is said to mean “island of rice.” Yet we know that rice was not introduced into this region until about 1600 B.C. In parts of Indonesia, rice paddies are considered sacred. Rice is involved in religious rites on the Indonesian islands of Kalimantan and Sarawak. Historically, in Java no girl is considered eligible for marriage until she can cook a perfect bowl of rice. There, rice is considered offspring of the goddess Dewi Sri. Find Java, Kalimantan, Sarawak, and the other Indonesian islands, and mark them with an I.

- The cultivation of rice in paddies began long ago in the **Philippines**. The rice-growing terraces on the mountainsides of the island of Luzon (one of the seven wonders of the world!) is thought to have been constructed by immigrants from southern China in

2000 B.C. Filipinos observe many rituals that are connected to rice. One is *Pagdiwata*, a thanksgiving festival that involves sharing rice wine with spirits. Mark the Philippines with a P.

- **Thailand** exports more rice than any other country and is often referred to as the “rice bowl” of the world. Thai people eat rice in many forms three times each day. It is enjoyed in main dishes, side dishes, snacks, cakes, and desserts. Find Thailand on your map, and mark it with a \$.

- **Korea** is another region that produces a lot of rice. In Korea during the harvest season, people traditionally offer rice tea to the ancestors. Rice is involved in other celebrations and rituals. For example, during the “choosing” ceremony, a young child is dressed in a traditional outfit and seated at a table. On the table are objects such as a brush, ink, rice, and money. The child is asked to choose an object. If the child chooses the rice, it is believed that the child will become wealthy. This ceremony is a practice of other cultures of Asia as well. Find North and South Korea on your map, and mark them with NK and SK.

- People in **Vietnam** usually have three meals each day, and rice (of course!) is a prominent feature. The Vietnamese use a great deal of rice flour to make rice cakes, rice noodles, and other delicious dishes. Find Vietnam, and mark it with a V.

Some Questions to Explore

- Look at the regions marked on your map. Between which latitudes do you find rice growing?
- What do these regions have in common with respect to climate?
- What countries on your map might not grow rice? Why?

Most of the people in the countries marked on your map eat rice three times each day. Is there a food that you eat this often?

Activity: Origin Stories

In Southeast Asian cultures, rice is a part of many origin stories. These stories describe how rice came to be. Here are two origin stories from Vietnam.

1. Once upon a time, the rice grain was a very large ball. At harvest time, people lit incense and candles and prayed. The rice ball would come into their house, and they would have enough rice for the season. Therefore, it was not necessary to cultivate rice.

Unfortunately, one year a lazy woman, in spite of her husband's instruction, delayed sweeping the house to make it ready for the rice ball. Her husband finished praying, but the rice ball arrived at their house before she had finished sweeping. The woman was so startled that she struck the ball with her broom, whereupon the ball burst into a thousand pieces, each as small as a grain of rice. From that time on, people have had to plant, harvest, and pound rice.

—From Phat, LeVan, *Stories and Legends of Annam* (Saigon: Imprimerie de l'Union Nguyen Van Cua, 1925, pages 163–8)

2. God never meant for people to have to work so hard to grow rice. At first, God sent a spirit messenger to earth with rice for people to enjoy. God gave the messenger two magic sacks and told him that the seeds in the first sack would grow when they touched the ground and would grow anywhere with no effort, giving a plentiful harvest. The seeds in the second sack, however, would need to be nurtured. But if tended properly, they would give the earth great beauty.

Of course, God meant for the seeds in the first sack to be rice, which would feed millions with little effort, and the seeds in the second sack to be grass, which people would enjoy as a cover for bare ground. Unfortunately, the messenger got the sacks mixed up. People paid for his error, finding that rice was hard to grow, whereas grass grew easily everywhere, especially where it wasn't wanted.

—From Hayslip, Le Ly, *When Heaven and Earth Changed Places: A Vietnamese Woman's Journey from War to Peace* (New York: Doubleday, 1989, page 7)

Activity: Creative Writing

Supplies Needed

Pen and paper

This publication includes poems, prayers, and short excerpts from stories, all about rice. Can you write a short story, poem, or haiku about rice or another grain or one that describes a gardening activity in your community?

Or, can you return a pen pal letter to Lanlan?

Some Questions to Explore

- What does the first origin story suggest about the traditional role of women in Asian culture? (Could the husband have helped sweep the house?)
- Try making your own origin story about rice, or about another crop.
- Act out an origin story as a skit. You might use hand or shadow puppets. (See the activity "Making Shadow Puppets" on page 25.)
- Search for a native American origin story about corn or potatoes. Look for origin stories about foods from other traditional cultures. A good source is the book *Keepers of the Earth: Native American Stories and Environmental Activities for Children* by Michael J. Caduto and Joseph Bruchac (see the section "References and Resources").

Summer 1974

Hebei Province, North China

Dear friend,

Hello again! Thank you for your letter. When did I last write? Was it spring? Had we finished the rice planting? It seemed to go on forever this year. That must mean we will be blessed with a big crop.

I know you want to hear about the rice, so I will start out with a report. My biggest job now is getting rid of the weeds. When the rice plants are small, it is very hard to see which plant is rice and which is a weed. With practice, we learn that the weed leaves are lighter in color and just a wee bit more transparent, so we pull them. We never kill anything—not even weeds. We pull them up and plant them somewhere else.

Summer is so hot and humid that it can be very uncomfortable, but otherwise it is a nice time. I certainly wouldn't call summer relaxing, but it does have a different pace. The fish are small, so the men are not fishing. We weed the paddies about every two weeks. We spend the rest of the time repairing the nets, making clothes, and getting caught up. We cut the reeds that grow along the channels and rivers. Reeds can be a pesky weed, and it is hard to control them. So we cut them and use them to make hats, baskets, containers, roofs, and artwork. We cook with their dried stems. This way an enemy becomes a friend!

We also make shoes in the summer. My mother makes ten pairs for each member of our family. Do you want to know how? First, we wash our old clothes in the river and lay them out to dry. My mother makes a glue with rice powder. Then she glues the clothes together on a flat surface, four layers deep. She never allows a gap in the layers. When the glue dries, it is hard. My mother uses a shoe pattern. There is a pattern for each of us. Every year she teases me: how fast my feet grow! She cuts the pattern out of the now hardened cloth layer. It is very difficult to cut. We make a special rope by hand, and she uses this rope to sew the pieces together. This is the hardest part. We punch a hole and pass the needle through, punch another hole and pass the needle through, until the shoes are finished. Have you ever tried to punch holes through clothing four layers thick that has been treated with rice glue? I didn't think so!

The rice fields and channels are full of fish, frogs, mice, turtles, and birds—so much life! I love to watch the fish darting among the plants. I find eggs hidden in the rushes in the channels along the paddies. The eggs are so pretty in all their many different shapes and colors. Our garden is beautiful this year too. We planted many vegetables and flowers. We do not waste any space at all. Our whole front yard is one big garden—we don't have a lawn. Years ago, the soil there wasn't very good. Our job—the children's—was to bring baskets of good soil from the river bottom to the garden. We added ash from our stove too (we burn rice stems in the kitchen). Over the seasons, our garden has become very productive.

We are going to the paddies now to look for eggs. Write soon.

Your friend,

陳兰兰

Lanlan Chen

Rice: The Plant



Rice plant

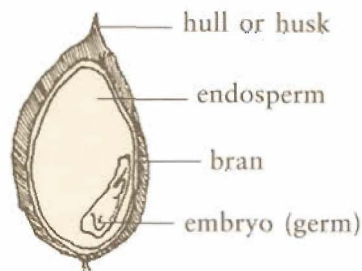


Detail of rice grains with their outer hulls

Rice is a member of the grass family. This family of plants is very important to humans! Wheat, barley, and corn are grass plants too. Rice belongs to the genus *Oryza*, of which there are twenty-five species. *Oryza sativa* is the scientific name of the cultivated rice that we eat.

Look at the drawing of the rice plant to see the different parts. Special names describe the different parts. Rice seeds are made up of the germ, the endosperm, the bran, and the hull, or husk. The endosperm is the food for the developing plant as well as food for us! The germ is a good source of oil and vitamin E. The bran covers both the endosperm and the germ and is full of fiber. Surrounding the seed is an inedible hull. It is important to know that the portion we eat is the dehulled grain.

Each part of the rice grain has many uses. The hulls of the rice grain, which are removed before eating, can be used in fuel, as mulch, or in various commercial products, such as abrasives. The rice bran is the outer layer on brown rice. It is often used in cereals and vitamins and is fed to livestock. Rice bran oil, a high-quality cooking oil, comes from the rice bran. Rice flour is used to make rice pasta, cereals, and snacks and is prized by those allergic to wheat flour and wheat flour products. Rice starch, which comes from the endosperm, is used as a thickener in baby foods, sauces, and desserts. It also can be made into a sweet syrup.



Rice seed

Raising Rice

There are two basic kinds of rice. Wet rice can grow in standing water because its specialized stem lets oxygen funnel down from the shoots to the roots. Although rice needs large amounts of water to grow well, it doesn't need to be grown in standing water. Upland rice is not grown in standing water. Upland rice is mainly raised in Brazil and in parts of Africa and Asia in combination with other crops on mountain slopes. Most of the rice that is grown is wet rice. It is raised in natural flood water, or in paddies, which are artificial pools.

The production of paddy rice is similar, regardless of the country. Different regions, however, use different methods. For example, in the tropical

island countries and in southern China, all farmers use the water buffalo to plow the land, whereas in northern China, more farmers use horses. Also, farmers in tropical regions grow three crops per year, and farmers in northern regions raise only one crop per year.

Making Paddies

Because land that is naturally flooded all year is rare, most farmers create paddies by making dikes around low-lying land and diverting water from nearby streams into these enclosed areas. They carefully manage a system of levies and small plots.

Water is drained from one plot to another.

Water buffaloes (or horses) pull the plows and prepare the land, turning the wet soil into a creamy mud. Animals are preferred because machines compact the soil and make it hard. Animals also produce milk and meat, and their manure is used to fertilize the land. They also are much less expensive! Many farmers value the special relationship that they have with their animals. They feel that animals are part of nature and that there is a give-and-take with animals that does not occur with equipment.

What are the advantages of growing crops on flooded land? For one thing, standing water rots the plant material that remains after harvest, adding nutrients to the fields. A blue-green algae grows on the water and provides fertilizer in the form of nitrogen. Flooding can help prevent weed growth, although as Lanlan Chen would tell you, some weeds such as reeds and rushes are still troublesome.



Marvin Pritts

Water buffaloes pull the plows and prepare the land, turning the wet soil into a creamy mud.

Planting Rice

Just as Lanlan described, rice seeds first are sown in seed beds, and after about 40 days, when the rice plants are about 8 to 9 inches tall, they are pulled out in bundles, stacked, and transplanted to the flooded paddies one by one. This is hard work! The women do the transplanting in perfect rows. Many older women are bent over permanently from this work and suffer from chronic back and knee pain.

Here is a popular song about planting from Vietnam:



In the heat of mid-day, I
plough my field

My sweat falls drop by drop
like rain on the ploughed
earth

Oh, you who hold a full rice-
bowl in your hands

Remember how much burning
bitterness there is

In each tender and fragrant
grain in your mouth!

—From Piper, Jacqueline M., *Rice in Southeast Asia: Cultures and Landscapes* (New York: Oxford University Press, 1993, page 46)

Harvesting Rice

The paddy field may be allowed to stand flooded until harvest, or it may be allowed to dry out. All harvesting is done by hand, and it too is often the work of the women. They cut and bundle the rice, stems and all, and take it to a place to be threshed.

After the rice has dried in the sun for a couple of days, it is ready for threshing. Threshing separates the rice grain from all the inedible parts. It is usually a community event. In some areas, much of the threshing takes place on the streets. Although traffic may be interrupted, the people know that rice comes first and take precautions not to interrupt the threshing.

In one method of threshing, the rice is placed into large, flat sieves, which people then walk over. The grain passes through the sieve, leaving the straw (stalks and stems) and most of the inedible hulls behind. The grain that falls through the sieve usually isn't completely clean. It may be passed through a sieve-like basket again, allowing the wind to blow away the remaining chaff, or the inedible parts clinging to it. This step is called winnowing.

The rice grains are generally stored in large baskets or bins. Taking the rice to a granary is often accompanied by important rituals or ceremonies.



Winnowing rice

Susan McCouch

Activity: Begin Your Own Rice Plants

Rice is very versatile. It needs a lot of sunlight and warm temperatures, but it can grow on almost any type of soil. Rice growing is associated with the tropics and subtropics, but crops grown with mild temperatures and long days usually outyield those grown in the tropics.

Supplies Needed

- 8-inch pots
- Seed-starting soil mix
- Rice seeds
- A pan, water

Conditions Needed

Direct sunlight for at least 6 hours per day, or grow lights; warm temperatures (70° F)

You can grow rice easily from seed, especially if you raise the shorter, early-maturing varieties developed for the colder rice-growing regions such as Japan and northern California. These varieties go from seed to harvest in about three months. Start with 8-inch pots filled with a sterile seed-starting mix. Place three seeds per pot, spacing them evenly.

Water the pots well after seeding. Place the pots in a pan, and fill the pan with 2 to 3 inches of warm water (70° to 80° F). Be sure to keep the water level at least 1 to 1½ inches at all times.

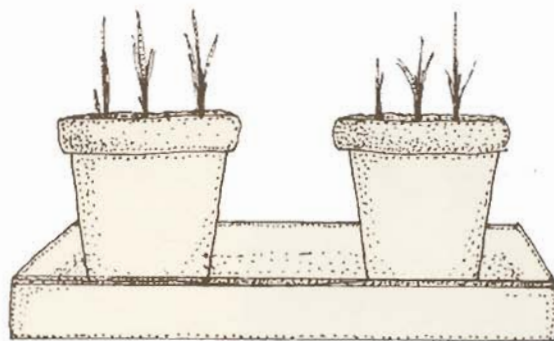
The most important factors for growing rice are constant warm temperatures, full sunlight, and a steady supply of warm water. Ideally, you should have a bright sunny window located in a warm, humid area, with a wide windowsill on which to place your plants. If this doesn't describe your growing conditions, you should consider using a heating cable beneath the plants, or find another source of bottom heat. If you cannot find a window that receives direct sunlight for most of the day, you will need to use a grow light.

Take notes as the plants grow. When do they emerge? Make a drawing of what the plants look like. When do the structures that hold the seeds form?

The seeds will be brown and dry when they're ready for harvest. Allow them to dry for a couple of days, and then harvest your crop. First remove the stems. You can do this by pulling the seeds from the stems with a gloved hand.

Once you've separated the stems from the seeds, you need to remove the hulls, or husks, from the seeds. To do this, you can pound the seeds gently with a stone, then turn on a fan to blow away the chaff (the part that you don't want to eat). Or you can take the seeds outside and walk over them, rubbing your feet over them briskly to separate the hulls. Using two broad baskets, pass the grain back and forth, allowing the wind (or a big fan) to blow away the chaff. Be sure to pick through the rice to make sure the seed is clean when you're finished. Store in a cool, dry place.

Be sure to save all the stems and leaves for the rice paper activity.



Activity: Build Your Own Rice Paddy

If your group is really ambitious, you may want to make your own rice paddy. The most important thing to keep in mind is that rice is very temperature sensitive and cannot tolerate cold temperatures. If you locate your paddy outdoors, you will need to start seeds indoors in March and transplant the small plants into the paddy in late May or early June.

Supplies Needed

- Rice seeds
- Seed flats or boxes
- Vermiculite
- Plastic liner
- Wooden posts or stones
- Soil
- A supply of water

Growing Transplants

First, plant the rice seeds in rows in the vermiculite in seed boxes or flats. After planting, place the flats in full sunlight and keep them constantly moist, not wet, with warm water. While your rice plants are growing, prepare your paddy.

Preparing the Paddy

Dig a shallow bed outdoors, roughly 8 to 10 inches deep and about 3 feet wide by 5 feet long (it can be larger if you like). Remove any stones from the bottom of the bed and smooth the soil. Line the bed with plastic, and secure the plastic around the edges with wooden posts or with stones. The plastic should be thick and not sensitive to ultraviolet light. An old piece of swimming pool liner is ideal.

After the danger of frost has passed, fill half of the shallow outdoor bed (which is now lined with

plastic) with soil. Add enough water to make a muddy slurry. When the rice plants are about 6 inches high, transplant the rice plants into the slurry, spacing them 4 to 6 inches apart. Although you will not have Lanlan's back-breaking experience of transplanting into paddies, you can still transplant the rice plants in perfect rows, just as rice farmers do. Can you imagine walking through mud like this for days at a time?

Most importantly, keep the paddy moist at all times!

If cold weather is expected, cover the plants with a protective cloth or row cover.

One of the most interesting things about your paddy will be the fact that it is something that very few people in your community may have seen. Take advantage of opportunities to share your project with other people!

Wild Rice

Wild rice is a popular gourmet grain in this country. It is a wild grass, not a true rice. It is enjoyed by native Americans, but unlike corn, it has been mainly harvested from the wild and, until recently, was not domesticated. Traditionally, wild rice was collected by holding the plants over canoes and shaking them to loosen the grains. Wild rice shatters readily (which means the seeds scatter quickly, before you have a chance to collect them), making this crop a challenge to "tame." Recently, plant breeders selected a strain of wild rice that doesn't shatter, so yields have risen. More than 17,000 acres are presently grown, but demand and prices are high.

Fall 1974

Hebei Province, North China

Dear friend,

I woke up this morning and looked at the river, as I do each day. I smelled the crisp air and remembered again why this is my favorite season. Fall is wonderful.

The fish are plentiful again. My father, grandfather, and brother left early this morning. We had a big celebration last night—you call it a party? It was fun. We sang and ate good food. The crabs are ready to eat. I wish you could visit and help me catch them. Do you know how? You go out at night with a net and a lamp. You hold out your lamp, and the light attracts the curious crabs. When they go to the light, you snatch them up in the net. I love to eat crabs and listen to my grandfather tell stories. But he is on the fishing boats now.

When the men return from fishing, we will be ready to harvest the rice. Before we cut the rice, we will celebrate. The night before harvest, we get together as a reminder of the importance of what we are about to do. Even more than planting, harvesting is the most difficult part of rice farming. It is all done by hand.

The water in the paddies has dried up. We can stand on the hard soil now—we can even sit down. We chop the rice and stack it while another person follows and picks up the bunches and ties them together. We stand the bunches to dry; they are lighter that way and do not rot as quickly.

After drying, a wagon takes the rice bunches to a concrete area where they are threshed. Some people do this by hand, but the people in our village use a bicycle-like device to thresh. One person sits on the bicycle and pedals, and this provides the power to thresh the grain. Pedaling is hard work, but not as hard as stomping on the rice would be.

Our whole village works together. Women work with women, men work with other men, and children work together too. We have a community storage for rice, and it belongs to all of us equally. This is not the way your farmers work, is it?

After the harvest, we have a big midmoon festival. It is a lot like your Thanksgiving. It is a time to celebrate! Rice is the first food served. People are ready to eat other foods also because we have been eating rice all year long. I love the moon cakes. We eat them whole. This symbolizes that things are whole, happy, perfect.

Did I tell you about the fish in the pools? The channels have dried up, leaving little pools just full of shrimp and fish. My brother and sister and I collect the fish and hang them to dry. We eat them during the winter. Sometimes we collect hundreds of pounds of them. They are delicious! The small ones provide food for the animals too. My sister and I are going to find some now. Write when you can.

Your friend,

兰兰

Lanlan



Rice as a Food

Rice is the staple food for about half of the world's population. It is a good source of energy because it is high in carbohydrates, or starch. It also contains just a trace of fat and no cholesterol. Rice is also easy to digest, which is why babies are often given rice cereal as a first food.

Preparation of Rice

Like many other grains, rice seeds are processed after harvest. The rice is dried and then pounded to separate the grain of rice from its hull. If just this outer hull is removed, the rice is called brown rice. If the layers of bran are ground away in the milling process, the result is white rice. White rice is also called polished, or milled, rice.

One popular benefit of stripping away the bran is that white rice requires about half the cooking time as brown rice. Because fuel was expensive in tropical rice-growing countries, white rice caught on quickly in the nineteenth century when milling first became common.

Unfortunately, processing rice to remove the bran had negative consequences. The bran contains important vitamins, especially for people who have no other sources of those vitamins in their diet. A disease called beriberi broke out among thousands of people in Asia and Africa who were living on diets of white rice. People with beriberi lost muscle tone in their arms and legs as a result of nerve inflammation that was caused by a lack of vitamin B1. Unless foods other than rice are not available, however, there isn't a big difference nutritionally between white and brown rice.

Today, you have many choices when you buy rice. There is brown rice, a chewy rice that still retains the bran. You can find many types of white rice, as you'll see in the next activity. Parboiled or converted rice, which has been partially cooked under steam pressure, then dried and milled, is popu-

lar in this country. Parboiling the rice seals in nutrients. Precooked rice is also available. Don't confuse parboiled rice with precooked rice, which has been completely cooked and dried, giving it a short cooking time.

Types of Rice

Rice can be divided into different types. Long-grain rice has a long, slender kernel—about four times longer than it is wide. These long grains are hard and starchy, separate easily, and become light and fluffy after cooking. Long-grain rice is grown in the subtropics and tropics. The grains of medium-grain rice are not as long as the long grains—only about two to three times longer than they are wide—and are moist, tender, and slightly clingy when they're cooked. Short-grain rice kernels are almost round, and they

cling together when cooked. These rices are favored by people who eat with chopsticks, including the Chinese and Japanese. Within this group are the "sticky" rices, which are almost jelly-like when cooked. Sticky rice is often used for ceremonial purposes.

The methods of cooking rice vary among countries and according to the different rice varieties. In some cases, large amounts of water are used, while in other situations the rice is steamed in just enough water to swell the grains. Occasionally, the rice is only half-cooked. Rice also can be cooked in a soup; made into noodles, which can be eaten stir fried or in soup; or made into a flour, which can be used to make both savory and sweet dishes.



Activity: Cooking Different Types of Rice

You can learn a lot about rice by tasting different kinds of rice. Before undertaking this project, you may have thought of rice as “just plain rice.” There are many different rices to choose from, however, and depending on where you live, you may find more kinds of rice than you ever knew existed. Some are long-grained, some short-grained, and others are fragrant and smell delicious when they’re cooking. You may be surprised at the taste and aroma of some rices.

People in different cultures have their favorite rices and prefer not to eat anything else. For example, Japanese and Thai rice are very different. Japanese people often do not want to eat Thai rice, while Thai people are equally unlikely to eat Japanese rice. During the Vietnam War, it is said that the Vietnamese used bags of rice sent from the United States either as food for their animals or to build walls because they didn’t like the way American rice tasted.

Supplies Needed

- Pans for cooking
- Several different types of rice

Visit your local grocery store. You will likely find brown rice. Parboiled and precooked or “quick” rices are readily available in grocery stores too. A gourmet or natural foods store in your area may have more types of rice in stock. See if you can find some of the rices listed below.

- Arborio rice, a medium-grained Italian import, used often in risotto and paella
- Basmati rice, a fragrant, long, slender grain imported from Pakistan and India
- Texmati, a U.S.-grown rice that is similar to Basmati
- Jasmine rice, a long-grain aromatic rice from Thailand
- Sweet, glutinous rice, a “waxy,” sticky, glue-like rice grown in California
- Wehani rice, or amber bran rice, a U.S.-grown rice with an unusual bran color and, like Jasmine rice, very fragrant
- Sushi rice, a Japanese rice favored for use in sushi
- Sticky rice, a moist, clingy rice that can be almost gelatinous in texture

- White rice, a long, narrow grain (although some types are medium- and short-grained) that’s usually enriched with niacin, thiamin, and iron

Are there other types as well? If the store carries wild rice, you may want to purchase a small amount just for comparison.

Measure out 1/2 cup of each rice. The package directions will tell you whether to wash the rice first. Cook 1/2 cup of each type of rice according to the directions on each package. If cooking times vary, time the rices so that they are done at about the same time. If you have more rice varieties than burners on the stove, you’ll have to stagger your cooking. Use the chart on the following page to help you taste-test the finished product.

Rice Products

Have you ever tried rice noodles? How about rice sticks? Many products are made from rice. Visit a store that sells Asian food products, or check in the gourmet or international section of a grocery store. Make a list of the rice and rice products that you see and star the unfamiliar items. You might find rice noodles (thick and thin); rice sticks; rice “paper,” or wrappers for spring rolls; and even rice flour. Try the following recipes; they may call for some of these ingredients.



Some Questions to Explore

- How easy was it to detect differences between the “fluffy” and “sticky” rices?
- Which rices had the strongest aromas?
- Which rice tasted best?

Try doing this activity in conjunction with some of the rice recipes that follow. Then you will have plenty of rice to enjoy with the various dishes.

Tasting Different Types of Rice

Type of rice	Appearance	Taste	Texture	Aroma	Comments

Activity: Recipes with Rice

From China: Vegetable Fried Rice

Preparation time: 1/2 hour

Cooking time: 10 minutes, plus cooking time for rice

Serves 6

- 2 cups cooked, cooled rice
- 2 tablespoons olive or peanut oil
- 1/2 cup sliced carrots
- 1 clove finely minced garlic
- 1/4 teaspoon grated ginger root or 1/4 teaspoon powdered ginger
- 1/2 cup fresh, sliced mushrooms
- 1/2 cup peas or snow pea pods
- 1/4 cup soy sauce
- 1 cup bean sprouts
- 1/4 cup green onions
- 1 tablespoon sesame seeds

1. In a wok or large frying pan, heat the oil on medium-high heat and add the carrots. Stir while frying for 1 minute.
2. Mix in the garlic and ginger and stir-fry for another minute.
3. Add the peas and mushrooms and stir-fry until they are crisp-tender, about 3 to 4 minutes.
4. Mix in the rice and soy sauce and cook until thoroughly heated.
5. Stir in the bean sprouts and green onions and stir-fry briefly.
6. Sprinkle with sesame seeds and serve.

From India: Kheer (Sweet Rice Pudding)

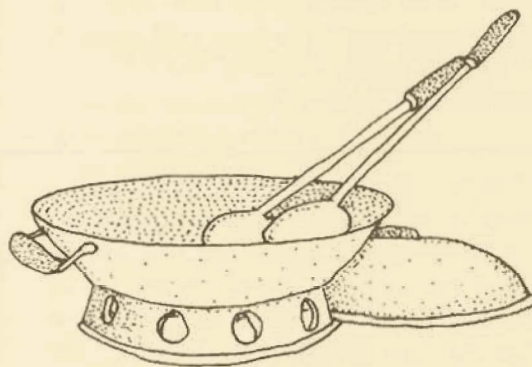
Preparation time: 1 hour

Cooking time: 20 to 25 minutes

Serves 4 to 6

- 1/4 cup long-grain white rice
- 4 cups milk
- 1/2 cup sugar
- 1/2 teaspoon ground cardamom (found in the spice section at the grocery store)
- 1/2 cup mixed dried, unsalted nuts
- 1/2 cup raisins

1. Cover rice with water and soak for an hour. Drain.
2. Bring the milk to a boil in a heavy saucepan and add the drained rice. Reduce the heat to low and stir often until the rice is fully cooked and the kheer reaches a thick consistency.
3. Add the sugar, cardamom, nuts, and raisins. Stir for 2 more minutes and serve. You may also cool to serve as a cold dish.



From Japan: Red Rice

This simple dish is traditionally used only for festive occasions. If you like, add your favorite spices to liven it up.

Preparation time: must soak beans overnight

Cooking time: 1 1/2 hours

Serves 6

- 1/2 cup red beans
- 2 cups sticky rice
- 1 teaspoon salt
- 1 tablespoon sesame seeds

1. Rinse and drain the red beans; cover them with water and soak overnight.
2. The next day, rinse them again and add fresh water so that the beans are covered by about an inch of water. Simmer in a heavy saucepan with the lid on until cooked; this may take at least 1 hour.
3. When the beans have cooked, add the rice and salt to the beans and continue to simmer until the rice is cooked. (Add a small amount of water if the rice seems to get dry before it finishes cooking).
4. Sprinkle sesame seeds on top and serve.

From the Philippines: Baked Rice Custard

Preparation time: 10 minutes, plus time to cook the rice

Cooking time: 1 hour

Serves 6

- 2 cups milk
- 3 eggs, well beaten
- 1/2 cup sugar
- 1/4 teaspoon salt
- 1 cup cooked rice
- 1/4 cup raisins
- 1 teaspoon vanilla
- 1/4 teaspoon cinnamon
- 1 tablespoon butter, broken into pieces

1. Preheat oven to 325° F.
2. Heat the milk just to boiling and remove from heat.
3. Combine the eggs, sugar, and salt. Stir in the hot milk slowly and add the cooked rice, raisins, and vanilla. Pour the mixture into a buttered 6-cup baking dish. Set the dish in a shallow pan of hot water. Sprinkle with cinnamon and spread the pieces of butter over the top. Bake for 1 hour.



From Myanmar: Fried Rice, Burmese Style

Preparation time: 1 hour

Cooking time: 15 to 20 minutes, plus cooking time for rice and chicken

Serves 4 to 6

4 cups cooked rice

2 tablespoons soy sauce

2 teaspoons butter

2 eggs

1 tablespoon vegetable oil

3 cloves garlic, minced

1 thinly sliced onion

1 cup thinly sliced cabbage

1/2 cup cooked boneless chicken, cut into strips (optional)

1. Toss the cooked rice with the soy sauce and refrigerate for at least 1 hour.
2. Melt the butter in a frying pan. Beat the eggs, pour them into the pan, and cook them over medium heat (without stirring). Cook until bubbly; the egg on the bottom should be cooked, while the egg on top will still be runny. Gently slide a spatula under the eggs and flip them over (if the whole omelet comes apart, simply pat it into place with the spatula).
3. When the omelet has cooked, slide it out of the pan and onto a plate, and cut it into strips. Set aside.
4. Meanwhile, fry the garlic and onion until transparent over medium heat in oil in a heavy-bottomed frying pan. Add the cabbage and cook for 2 minutes.
5. Add the rice and chicken and increase the heat slightly while stirring quickly. Cook for about a minute or until heated through.
6. Place the rice mixture in a serving dish and garnish with the omelet strips. Serve with chopped onions, cucumbers, and tomatoes.

From Vietnam: Fruit with Rice Dumplings in Ginger Syrup

Preparation time: 2 hours (to chill the fruit and syrup)

Cooking time: about 1/2 hour for reducing the liquid, 5 minutes for cooking the dumplings

Serves 4

1 11-ounce can mandarin orange slices

1 8-ounce can pineapple chunks

6 cups water

2/3 cup sugar

1 tablespoon thinly sliced ginger root

1/3 cup glutinous rice flour

3 tablespoons warm water

1 teaspoon toasted sesame seeds

1. Chill the cans of fruit.
2. Combine 3 cups water with the sugar and ginger root in a large saucepan. Bring to a boil, then reduce the heat. Continue to simmer until the liquid is reduced to 2 cups.
3. Cool, then cover and refrigerate until chilled, leaving the ginger root in the syrup.
4. In a small bowl, blend the rice flour with warm water to make a soft dough. Add more water if needed. Divide the dough into 16 pieces. Roll each piece into a ball.
5. Bring 3 cups of water to a boil in a 1-quart saucepan. Add the rice flour balls. Simmer at medium heat until the dumplings rise to the surface. Cook 1 more minute. Lift the dumplings from the water with a slotted spoon and rinse them with cold water.
6. Just before serving, drain the canned fruits, discarding the liquid. Strain the syrup to remove the ginger root, and divide the syrup among four dessert bowls. Divide the fruit among the bowls and place four dumplings in each bowl with the fruit. Sprinkle each serving with 1/4 teaspoon sesame seeds.

From Malaysia: Coconut Rice

Cooking time: 25 minutes

Serves 8

2 cups rice
2½ cups water
1 cup coconut milk
cucumber slices
dry-roasted peanuts
hard-boiled eggs, sliced

1. In a heavy saucepan, combine the rice, water, coconut milk, and a pinch of salt.
2. Bring the mixture to a boil over medium-high heat, then lower the heat to a simmer. Cover the pan with a lid.
3. Cook until all the liquid is absorbed. Garnish the rice with the cucumber slices, peanuts, and hard-boiled egg slices, and serve.

From Italy: Risotto

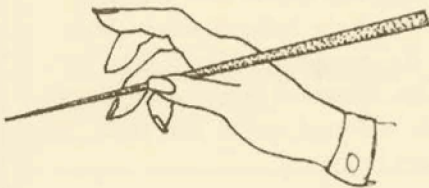
Cooking time: 1 hour

Serves 6

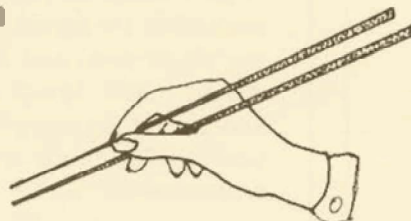
1 16-ounce can chicken broth
4 cups water
3 tablespoons butter
1½ cups arborio rice
½ cup freshly grated Parmesan cheese
salt and pepper to taste

1. Combine the chicken broth and water in a saucepan. Bring to a boil over medium heat.
2. Meanwhile, melt the butter in a heavy skillet over medium heat. Stir in the rice and cook until the rice begins to brown.
3. Add ½ cup of the broth mixture to the rice. Reduce the heat to low and stir until the liquid is absorbed.
4. Continue stirring in the broth in this manner, adding only ½ cup at a time, until all the liquid is absorbed and the rice is tender, about 25 minutes. Stir in the cheese and add a dash of salt and pepper. Serve right away.

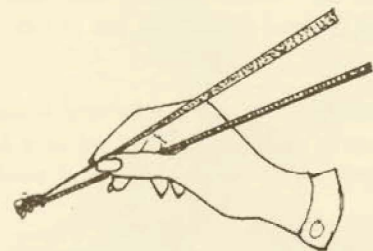
A Way to Use Chopsticks



Hold first stick between thumb and ring finger.



Place second stick between tip of thumb and forefinger. Move this stick up and down to pinch food.



Practice picking up chunks of food by pinching two sticks together.

Winter 1975

Hebei Province, North China

Dear friend,

How are you? It is very cold here now. A pipe from the cookstove runs under our beds, so we feel very warm while we are sleeping. Rice harvest passed quickly, and now all the channels are frozen. We can ice-skate all the way to school. There are so many rice fields that you can find a river just about anywhere and make it all the way to school with few crossings over land.

This is a peaceful time. At home we are mending the nets, doing needlework, and making tools and toys. My father and grandfather have come home from fishing. They tell a lot of stories of the sea. They tell other stories too. Once when I was little, I asked my grandfather, "Who lives on the other side of the sea?" He told me, "People with red eyes and green hair." I was so scared! Now I understand that Grandfather must have been telling me about your celebration called Halloween!

We carve the stories in wood on the walls inside the house. Our whole family history is written there! The older children tell the same stories to the younger children, and we all know them well. But I always love to hear the new stories.

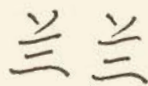
What can I tell you about rice? I have finished telling you about how to grow it. Have I told you that we eat it every day along with the many things that go with it? Each morning around 6:15 we all meet for a bowl of rice soup and tofu. At lunchtime we have rice cooked with a stir fry, sometimes with a little egg or seafood. Every night we have freshly made rice noodles—my mother's are so good! These are made with rice flour. We do not eat desserts or sweets except at very special celebrations. (I understand that Americans enjoy sweets quite a bit!) What food do you eat every day?

Have I told you about the other things we make with rice? We make all our cardboard boxes and paper out of rice. In the winter we make decorative pictures with it. Rice stems make a very fast-cooking fire. Outside, we use rice stems to cook wild animals—you call it a barbecue. Delicious!

I would like to see your country sometime. I will bring you a bag of rice seed that our family grew. We always bring rice when we visit our friends.

Write to me when you can. I always look for your letters, especially during winter!

Your friend,



Lanlan

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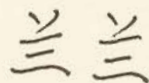
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Lanlan

Rice in Celebration

In the United States during wedding ceremonies, rice is thrown at the bride and groom after vows have been exchanged. This symbolic act is supposed to bring the couple good luck, and it conveys the wish for a fruitful marriage.

In Asia, magical beliefs that surround the growing and eating of rice can be seen in many rituals. On the Indonesian island of Java, the legendary goddess of the rice harvest is called Dewi Sri, and images of her are found throughout the region. She often is pictured with her male companion, and together they bring blessings of prosperity into a home.

In celebration of the rice harvest, ceremonies honor and thank Dewi Sri as guardian of the people's rice culture. One ceremony—the "first fruits

ritual"—takes place just before the harvest to honor the rice goddess. Rice stalks are cut and tied together by villagers to form dolls that symbolize Dewi Sri and her partner. The dolls are taken to a home or rice granary to ensure a bountiful future.

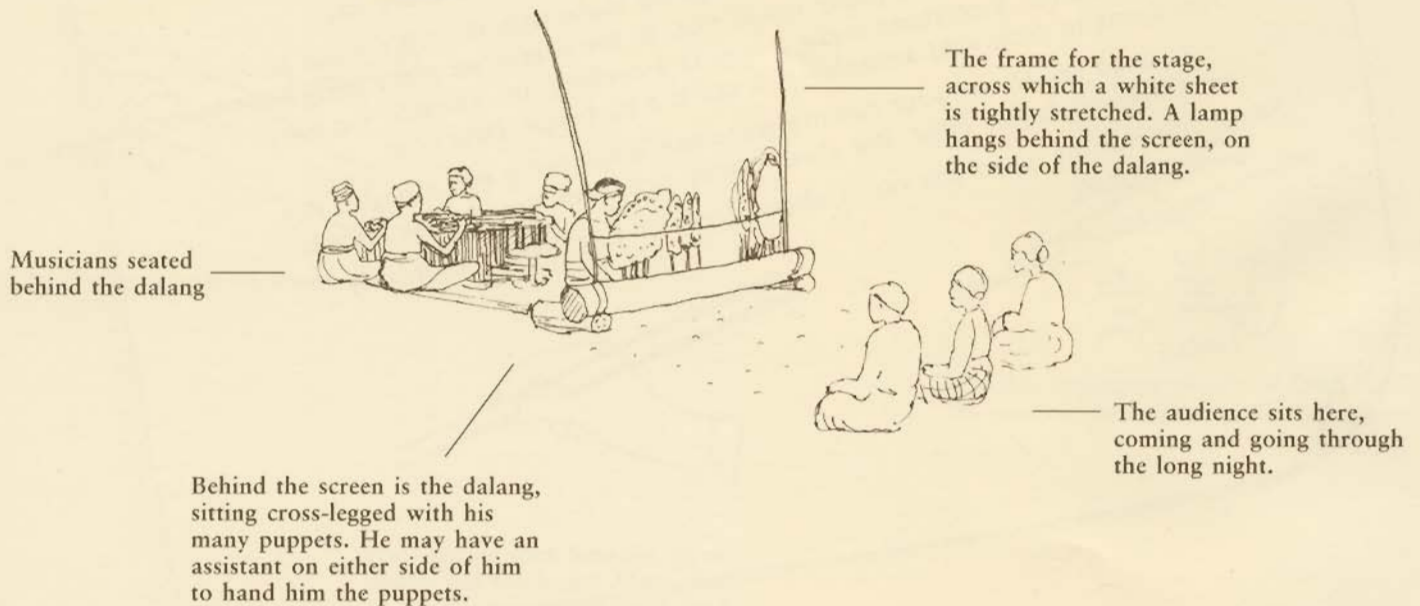
An aspect of this celebration often features a performance of a shadow play. The shadow play, *wayang kulit* (why-AHNG COO-lit), is one of the most recognized and important performing arts in Indonesia and in many other Asian countries as well. The stories retold in a shadow play range from great epics to shorter tales. They are paid for by sponsors, such as a family, a community, or an organization. It is believed that honor is bestowed upon the sponsor of a *wayang kulit*, which in turn benefits the whole society.

Shadow plays are performed using puppets made out of flat pieces of animal hide. They are painted and punched with elaborate designs and delicate patterns. This tradition has been handed down through generations of puppeteers. The characters portrayed in shadow plays are easily recognized by those who have viewed a *wayang kulit* many times. They represent ogres, clowns, gods, goddesses, and heroes.

The puppeteer, or *dalang* (da-LONG), mounts each shadow puppet on a handle made of horn. Many have moving arms or mouths, which are controlled by long, narrow rods. Not only does the *dalang* perform the shadow puppet play through the mastery of movement,

shadow, sound, and dramatics, but people believe that the puppeteer acts as a medium between the world of humans and the world of the spirits. Through trances, the puppeteer makes offerings to appease the spirits, and through his performance, he entertains the audience.

Shadow play performances are traditionally conducted after sundown, and they often last throughout the night. The *dalang* sits behind a screen. An oil lamp next to him projects the puppets' shadows. The audience sits in front of the screen. The audience can't see the surface design on the puppet, but it is important to the puppeteer.



Activity: Making Shadow Puppets

Some Questions to Explore

- Have you ever seen a shadow play? Are there people in your community with Southeast Asian roots? You might want to ask them to share their shadow play experiences with you.

- Imagine yourself as the dalang. What story would you like to perform? Who are the characters?

- Picture your favorite cartoon characters. Which are the easiest to remember? Why? Are the ones you have seen many, many times the easiest to remember?

- Think of the stories you have heard over and over again since you were very young. Are some of them alike? Is there often a hero? A very wise person? A bad person? A beautiful princess? Does good win over evil? Some of these themes are common in shadow plays too.

In this country, shadow games were popular parlor games during the early part of the nineteenth century. People used their hands instead of puppets to make shadow shapes on the wall. You can combine the traditions of Southeast Asia and the United States to create your own puppets and shadow play.

You may want to cut out familiar silhouettes, such as a scarecrow, a princess, or a witch, and create a play from a fairy tale that you already know.

Or, you could create your own play about living on a rice farm. Imagine that your family farms the land and harvest time is near. What celebrations would you like to have? Also, what threatening and suspenseful situations could occur? They add excitement to your play.

You also may want to create a puppet similar to a traditional Indonesian silhouette. For this, you can choose from the three templates that are included.

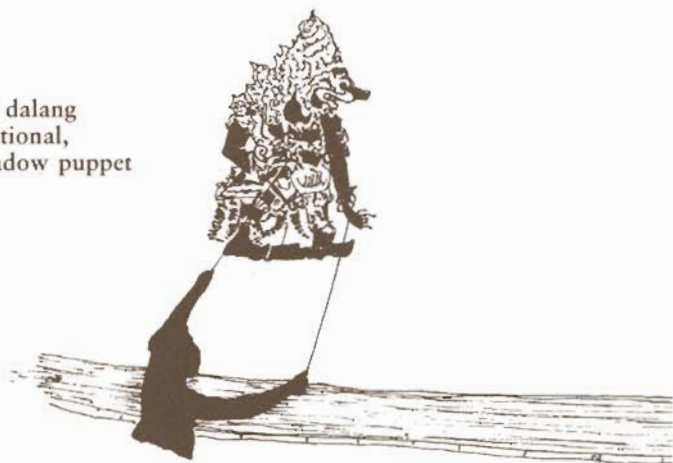
Supplies Needed

- Heavy paper
- Scissors
- Hole punch
- Brass paper fasteners
- 1/8-inch dowels or barbecue skewers

To make a simplified version of the traditional puppets, follow these instructions:

1. Photocopy a template (on pages 27, 28, 29), and cut out the pieces.
2. Lay the template pieces on a sheet of poster board, card stock, or other very heavy paper. Draw the outline of the template. Cut out the figure.
3. Wherever there is a small circle, square, or triangle on the template, you will need to punch a small hole on the figure with a hole punch. Where there are small circles, punch the holes and attach the arm parts with very small brass paper fasteners. The arms will move at the shoulder joints.

Silhouette of dalang holding traditional, elaborate shadow puppet



4. At the locations marked with a triangle, punch holes and fasten dowels or skewers with #3 brass paper fasteners. They will allow you to hold the puppet upright.

5. At the locations marked with a square, fasten another dowel or skewer to each moving part. Hold the dowel that supports the puppet while moving the dowels that move the arms.

Use this same procedure to construct puppets created with your own designs.

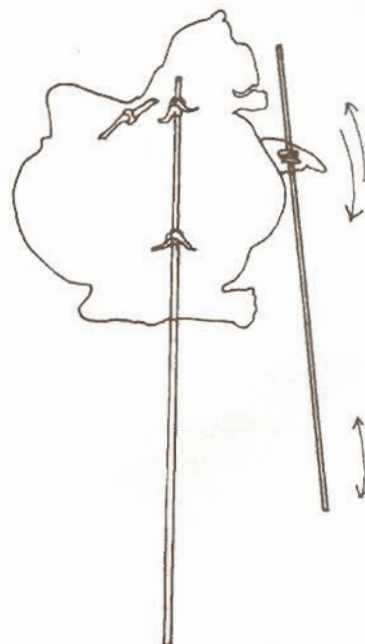
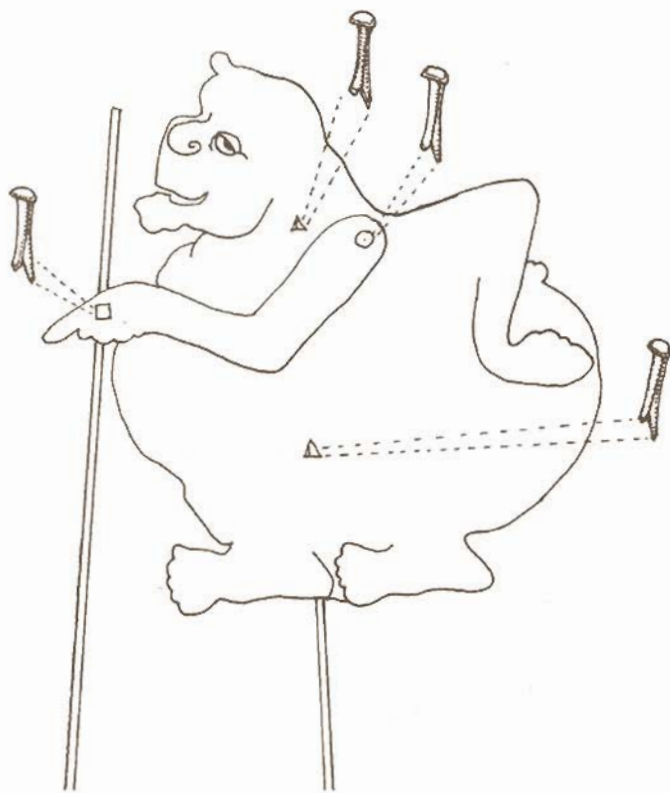
Remember that your audience will see only the shadow, or silhouette, of the puppet, not the surface, because a screen will be between them and you. Traditional puppets also have decorative cut-outs in them. Light passes through these cut-out areas, adding a fanciful and dramatic quality to the shadow characters the puppets represent.

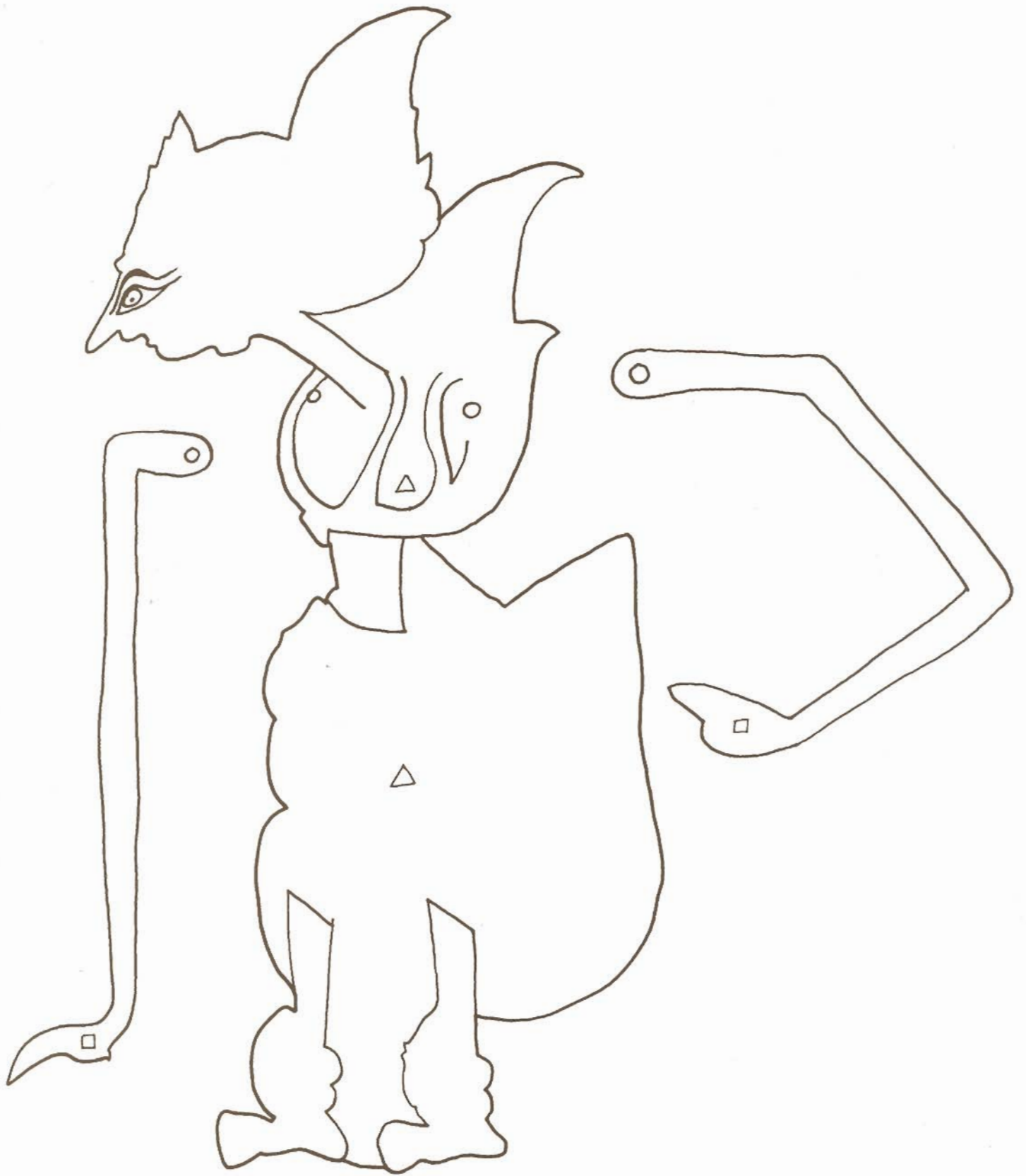
You can make a screen with any light-colored fabric. How you hang the fabric will depend on where you stage your play. You can make a screen by attaching a piece of fabric to a wide doorway, or you can suspend the fabric from the ceiling. If you're in a large room, you can stretch a piece of fabric tightly over a frame large enough to accommodate one or two puppeteers.

Wherever you stage your play, it will need to be very dark so that a light shown from behind the puppets will pick up their detail. Experiment with different methods to see which is best.

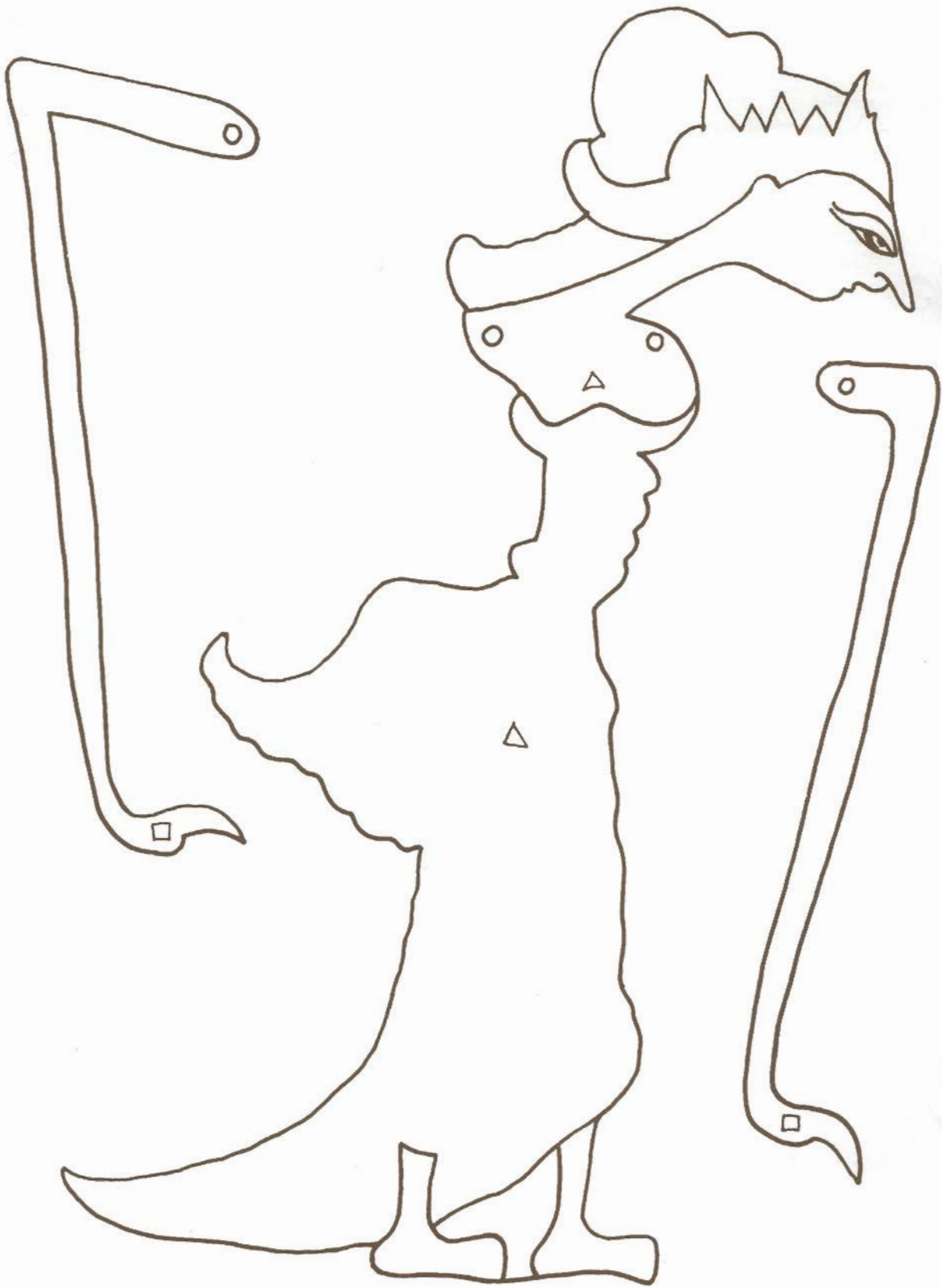
When you are ready to show your play, position your audience so that they sit on one side of the screen. You will sit on the other side, working the puppets. Place a bright light behind the puppets so that your audience can see only their shadows. Or have a friend hold a flashlight.

Music from an area of Southeast Asia could really set the mood. See if you can find some!

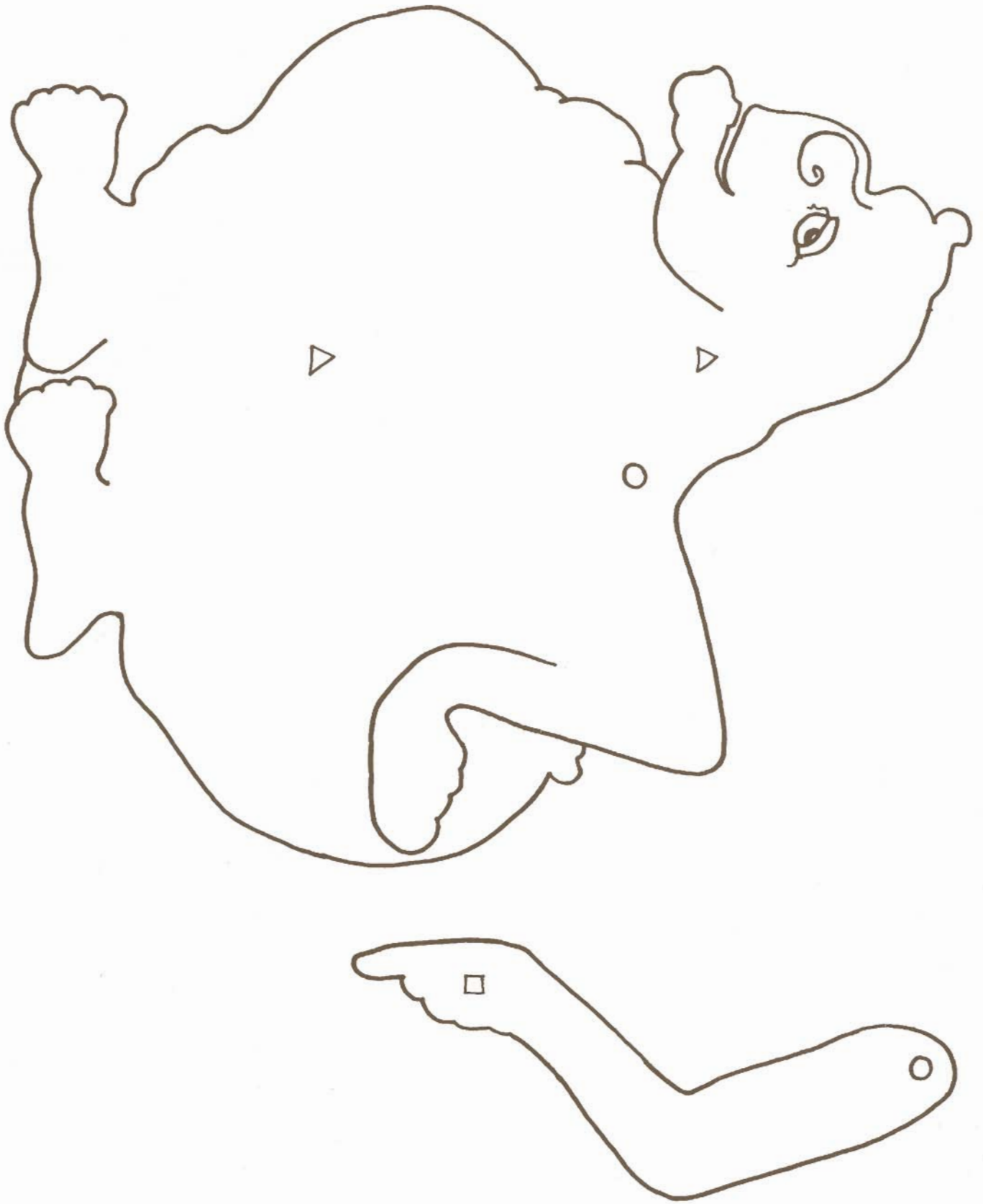




Salyā—young, handsome, and virtuous



Satyāwati—beautiful bride of Salya, daughter of a monstrous giant



Kjai Lurah Semar—a much-loved clown who also is wise and powerful

Other Uses for Rice

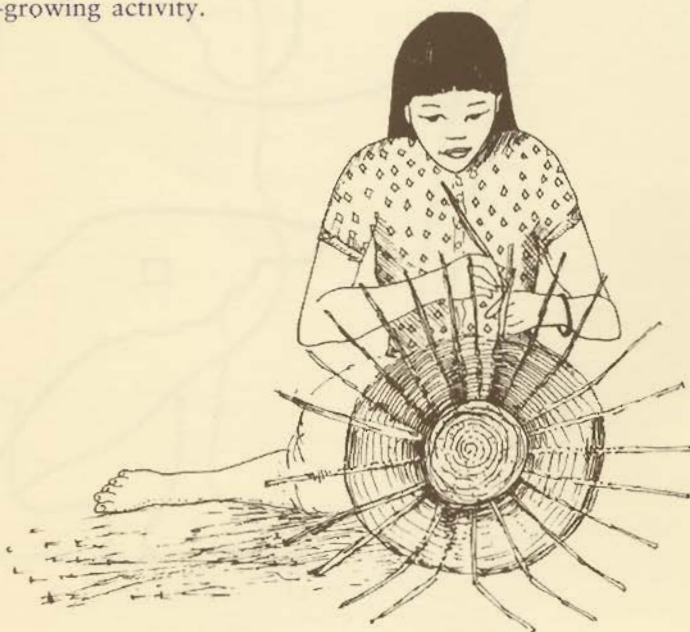
Many cultures use crop plants for more than just food. Native Americans have used corn plants to make everything from baskets to mattresses, dolls, and moccasins. Gourds have been used to carry water. Have you ever seen beautiful ornaments and wall hangings made from shafts of wheat? This tradition originated in Europe.

Likewise, people from the rice-growing regions of Southeast Asia have found many uses for the rice plant. Seeds are saved for planting the next season. The rice grain is used to make wine for ceremonies. The oil from the rice bran is used in cooking, and rice paste is used as face paint during certain celebrations. In Southeast Asian cultures that consider wasting things to be a bad practice, the people have many uses for rice straw—the stalks and other parts of the rice plant that are left over and not eaten. Rice straw is

used as fuel, to mulch other crops, and to make hats, mats, rain gear, and even sandals. In some countries, such as Japan, these articles are beautiful as well as functional.

Other people in Southeast Asia, particularly in China and in the Philippines, have created another interesting use for rice straw. They produce a thin, light-colored paper that they use to create cards, stationery, boxes, dolls, and art paper. (This paper is not to be confused with manufactured rice paper, which is made from the spongy pith of the rice-paper plant and is mostly used for watercolor and in the production of artificial flowers.)

You can make paper from the rice stalks, stems, and leaves left over from your rice-growing activity.



Activity: Making Paper with Rice Straw

The process of making true rice straw paper involves the use of some very corrosive materials, including sodium hydroxide, or caustic soda. The following activity “cheats” a bit and uses cotton paper pulp and rice straw as a decorative filler. The rice parts will appear as pretty flecks of green and tan in your paper.

Making paper is not difficult, but it does involve several steps, which are grouped loosely into two main activities. The first is “pulping,” which involves breaking down the fibers—cotton and chopped up rice straw—into a pulpy mass. After the pulp is

prepared, the second activity is to form the sheet of paper. Other optional steps include dyeing the pulp to give it a color, or adding bits of silk, flowers, grass—you name it!—to provide interest.

There are many paper-making recipes. The one that follows uses cotton linter paper as the base for the pulp and yields a truly beautiful product. The nice thing about making paper is that the process is very flexible. Amounts don't have to be precise to produce a good-looking paper, so relax and enjoy the process! Experiment with recycled paper or other materials to create different products.

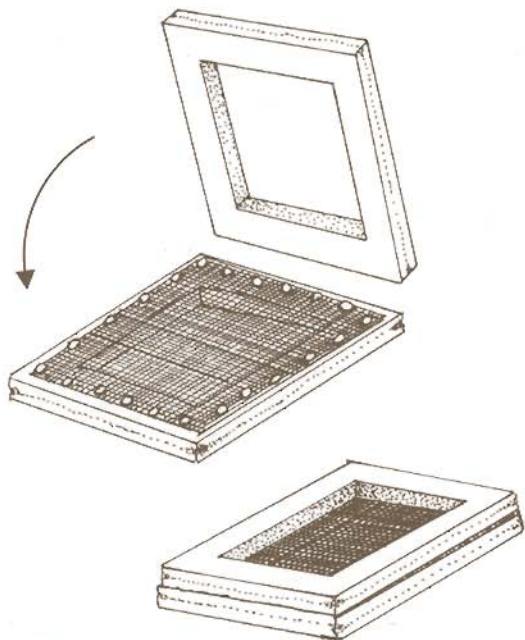
If you wish to carry out this activity before you actually have rice straw, you may substitute the leaves of another grass plant.

Supplies Needed

- Two matching softwood picture frames (a 5-inch x 7-inch opening works well)
 - A piece of fine metal or plastic screening, slightly larger than the opening of the picture frames. Window screening is suitable, or you can purchase nylon screening at an art supply store.
 - Tacks
 - In paper making, the frame with the accompanying screen is referred to as a *deckle*. A deckle also can be made from two wooden stretcher bars that are used to stretch and hold canvas. You can find these at an art supply store.
 - Several pieces of felt, muslin, or old bed sheets; each piece needs to be slightly larger than the frames.
 - Cotton towels
 - One large (30-inch x 28-inch) sheet of cotton linter. You can purchase this inexpensive material from an art supply or stationery store, and the price goes down even more if you buy it in bulk. For the activity, you'll need roughly a 14-inch x 15-inch sheet, which you can tear from the larger sheet.
 - A large bowl
 - A measuring cup
 - Roughly 1 tablespoon of clean stems and leaves of rice plants, cut into fine (1/4-inch to 1/2-inch) strands (add more or less to achieve different effects). You can use fresh green stems and leaves or dried brown ones to create different effects.
 - Optional: sizing (such as for treating walls) can be purchased by the packet and used according to directions. It will make the paper easier to write on if a surface suitable for writing is your intention.
 - An electric blender
 - A rectangular dishpan that is a little larger than the frames
 - A rolling pin
 - A sponge
- If you do this activity as a group, plan on having enough screens and frames to provide at least one deckle for every three people. Having one for each person is ideal, but sharing will save money. Just remember that it will take a little longer for everyone to have a turn.

Before you begin:

You will need to prepare your deckle using the frames and the screen. To do this, lay the screen over one of the frames and tack it along the edge. If the screen is metal, always tape the edges of the screen to prevent cuts to hands and fingers. Lay the other frame, face side down, on top.



The deckle

To make paper:

1. Work on a surface that you don't mind making a mess of! If it's a nice table, you might want to cover it with a sheet of plastic to protect it. Get ready by laying several thick towels on the table. Cover the towels with a piece of felt, sheet, or muslin. (You will be pressing the slurry that is held in the deckle—what will eventually be your sheet of paper—directly onto the felt. The towels will absorb the water, and the felt, or other smooth-surfaced material on top of the towels, will allow the paper to be peeled off without sticking.)

2. Begin by tearing a 14-inch x 15-inch piece of cotton linter paper into small (1-inch x 1-inch) pieces. Put the pieces into a large bowl and cover them with water until they are thoroughly soaked—10 to 15 minutes.

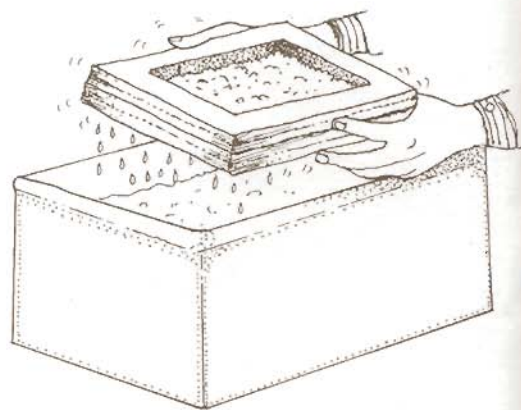
3. To prepare one batch of paper pulp, add the following ingredients to your blender. You may not be able to fit all the ingredients into the blender at once, so simply blend small amounts of the cotton linter with part of the water, and continue until you've blended all the ingredients:

- 1 cup, packed full, of the soaked cotton linter pieces
- 10 to 12 cups of water
- 1 tablespoon of prepared rice straw
- sizing (optional)

4. Blend the pulp until you can no longer identify individual bits of paper. If you are using sizing, add to the blender the amount recommended on the package. The consistency of the mixture, or slurry, will resemble a watery soup. You may wonder at this point how paper can be made from such a mess. This is normal! As you finish each blenderful, pour it into the dishpan.

• Optional materials to be added to the slurry after blending: small bits of silk, fabric, flowers

5. You will need enough of the pulp mixture to fully cover your screen. After you have made the first batch, dip the deckle into the slurry, screen side facing up, to see if it generously covers the screen. If the amount seems skimpy and barely covers the screen, repeat these steps to get more slurry.



Dipping the deckle into the slurry

6. When you have plenty of slurry, hold your deckle so that the screen tacked to the bottom frame is facing up, and place the face of the other frame on top of it. Holding these together tightly, dip the screen sidewise into the pulp mixture and move it around until the screen is completely and evenly coated with pulp. (You can cheat a little and lift some pulp with your hands and lay it on the screen to thicken it up.) When the screen is evenly coated with slurry, lift the deckle carefully out of the slurry. Hold it level and let it drain for a minute or two.

7. After the water is no longer dripping steadily from the deckle, you're ready for the fun part—pressing your paper.

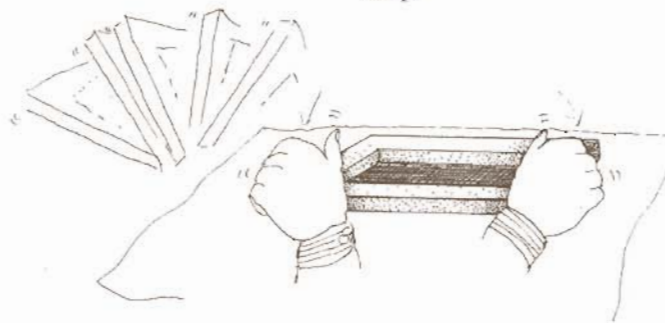
8. Gently remove the top frame. You will see that the top frame has shaped the pulp on the lower frame into a neat square.

9. Carefully and quickly flip the screen, pulp side down, onto the felt. Sponge the back side of the screen—which now is on top—to remove excess water. Then gently press down and rock the deckle back and forth to press out water into the towels. This step is called couching (pronounced KOOCH-ing).

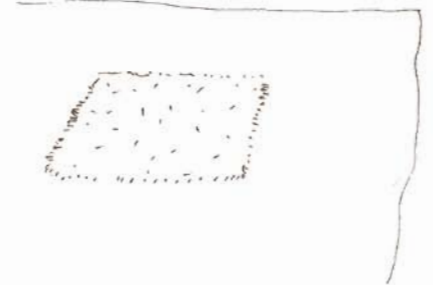
10. After you've couched for a minute or so, slowly and carefully lift the deckle, from one side to the other, away from the pulp. The wet paper will stay on the felt fabric. Remove the deckle and admire your handiwork. Use the rolling pin to squeeze out more water by gently rolling across the top of the paper a few times. If the paper begins to buckle or shift at all, stop.

11. If there is a lot of water under the felt, gently lift the felt along with the paper and place it on a fresh towel to dry thoroughly (which can take one to several days, depending on the thickness of the paper). If you're in a hurry, you may iron the paper beneath a layer of muslin until it is dry.

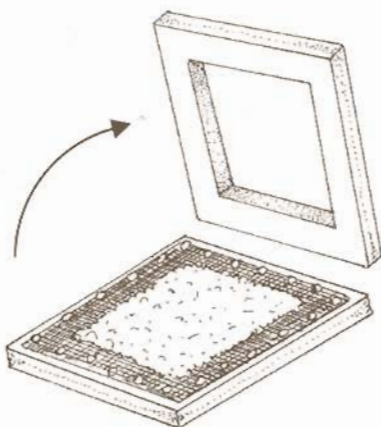
12. You now have a piece of paper! This unusual rice plant product is your own unique creation. Use it for stationery, as a unique background for a pressed flower picture, to paint on, or as pages of a beautiful journal.



Flipping the screen, and couching



The finished rice paper



Lifting the top frame

Rice in the United States

You may be surprised to learn that the United States produces a lot of rice. In fact, our country is the number two exporter of rice in the world.

Rice growing began in the colony of South Carolina in the 1600s. The conditions there were just right for growing rice. Africans brought to America the knowledge and skills to raise rice that they'd gained from experience in Africa. Sadly, they provided the labor as slaves for what came to be a huge rice industry.

As millions of bushels of rice were produced in the Carolinas, people in Georgia and Louisiana began to grow the crop.

The Civil War moved rice growing westward because it ended the plantation era. World War I contributed to the expansion of the rice industry into the Southwest and California. Today, California, Arkansas, Texas, Louisiana, and Mississippi are leading rice-producing states. Rice is mainly seeded by airplanes and is intensively managed with specialized equipment.



In Nagsaag, when the moon peered over the high Carabello Mountain while we were eating, Mother would get up from the table, spade her fingers into the smoking rice, scoop out a handful, then run to the open window and hurl the cereal toward the moon, saying under her breath, "We'll eat ahead of you."

This was a ritual which Mother always performed every night after the full moon, in the belief that an offering to the moon brought good luck, which Father scoffed at, but I myself tended to believe, because after the rice was thrown, the moon would usually shine with more luster, bringing us children out into the bright night to laugh and play.

—From: Diaz, Manuel S., *Rice for the Moon and Other Stories* (Quezon City, Philippines: New Day Publishers, 1985, page 47)

See if you can find out:

- How have technological developments influenced rice farmers?
- What is the impact of the development of different varieties of rice?
- Are Southeast Asians eating more rice varieties now than they did previously?
- Are Southeast Asians more willing to eat imported rice than in past years?

Epilogue: 1995 Beijing

Hello, dear friend,

I know that I haven't written in many years. How have you been? How is your family?

So much of my life has changed that I don't know where to begin. I really need to fill you in! I am sure you have heard about some of the changes in China. Certainly many of them are positive. I have studied in a university and have learned of many new options in my life. There seem to be more alternatives for women now. There are certainly many new business opportunities here, and I have to admit that I'm making a fair amount of money these days. It seems as if everyone is seeking to make a little money!

Most of the people in our village have left rice farming. Our family has not planted rice in recent years, but of course, I always hear what is going on. I've heard that there is a new kind of threshing machine, so harvesting is surely easier. The farmers also use some new chemicals to kill the weeds, so the back-breaking summer labor is gone. There also is something to spray to kill the diseases that harmed the rice. It must make the farmers happy not to work so hard! My grandmother always told me not to kill, not to upset the balance. I can't help but wonder—does that include weeds and diseases of rice as well?

We buy our shoes now. Come to think of it, it seems as if we buy just about everything. This is new to me, but not to you. By the way, when you buy everything, what do you do with the waste? Everywhere I look I see garbage. When we made everything, we never threw things away, they had a use. What do you do, my friend?

As you can see, I am wrestling with these changes, so excuse me if this letter is getting sour! I will be visiting your country soon on business and will be near where you live. Let's try to get together. We can talk more then. Enclosed is a picture of my children!

Your friend,

兰兰

Lanlan



Lois Chaplin

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P.O. Box 740123
Houston, Texas 77274
Tel.: (713) 270-6699
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- Virmani, Inderjeet K. 1991. *Home Chefs of the World: Rice and Rice-Based Recipes*. Laguna, Philippines: International Rice Research Institute (IRRI) and Suhay International Women's Organization.

To Order Rice Seed

- Rice seed is available for \$2 a packet from Kathleen Howard, Cornell University, Department of Soil, Crop, and Atmospheric Sciences, Emerson Hall, Ithaca, NY 14853.

Marcia Eames-Sheavly is an extension support specialist, Department of Fruit and Vegetable Science, Cornell University.

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Illustrations by Marcia Eames-Sheavly

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