

# Iranian Food

by ReadWorks



Photo Credit: Miansari66, CC0

*Photograph of chelo kebab*

**Chelo-kebab** is the national dish of Iran, which comes as no surprise. Not only is this dish extremely popular throughout Iran, but also its flavors are absolutely delicious. Chelo kabab is made up of tender meat, saffron rice, and juicy grilled tomatoes. There are many variations of this dish. One variation is called koobideh, which is a kebab of ground meat with onion and spices. Another variation is joojeh, which is a kebab of marinated chicken. In Tehran, there are hundreds of restaurants that serve these variations of chelo-kebab. Is there a specific variation you would like to try?



Photo Credit: Stephen Howard, CC BY-SA 2.0

*Photograph of Tahdig rice dish*

Another famous dish in Iran is **tahdig**. This dish refers to a type of rice preparation. Relative to the traditional preparation of rice, which simply requires boiling the rice in water, preparing tahdig is very time-consuming. Before cooking the rice, the chef needs to let it sit in water for one hour. Soaking the rice guarantees that the individual grains of rice will be separate. This separation is required for a good tahdig. After soaking, the rice is cooked in a pot. If the tahdig rice is prepared correctly, then the rice should be crispy and golden at the bottom of the pot.



Photo Credit: AilinParsa, CC BY-SA 3.0

*Photograph of Ashe e Reshteh*

In addition to being delicious, some types of Iranian food serve as symbols. **Ash e Reshteh** is a noodle and bean soup that signifies good luck. The noodles in this soup represent the different paths a person can take in life. The reason it holds this meaning is that the noodles were initially transported along a path from China to Iran. This soup is often served before a person leaves the country or goes off on a journey. Ash e Reshteh is also served during the Persian new year.

# The Roots of Southern Food

by ReadWorks



A plate of food at Martha Lou's restaurant in Charleston, South Carolina, is a beautiful sight to behold. Vibrant, brightly colored vegetables sit side by side on a white plate. Stewed okra, turnip greens, fried chicken, and cornbread are on the plate. Sweet iced tea is in a glass, and for dessert there is banana pudding.

The food Martha Lou cooks is called "Southern food" or "soul food." Southern food people eat today originated in the American South, but it can now be found all over the United States. Southern food is the result of hundreds of years of trade across oceans. It is mostly the result of cultural exchange between Africans, Native Americans, and Europeans.

Before the first Europeans arrived in North America, the Native Americans living in various parts of the continent had different diets, depending on the plants and animals in their region.

Some of the crops Native Americans ate included corn, squash, and beans. Generations of Native Americans improved the crops by selecting seeds for the next harvest from the tastiest crops. They also hunted animals such as squirrels and bison. Each tribe had its own cuisine and cooking habits, but they shared many of these common ingredients.

When the Europeans first arrived in North America, they had never tasted American plants before. The first European settlers brought their own seeds with them. Spinach, turnips, and radishes are all vegetables that came from Europe. In time the Europeans began to eat the American plants as well. Because corn and squash were originally from America, they were sometimes easier to grow in America than the European vegetables. Over time a new "American" diet evolved with dishes that used produce from both Europe and America.

But Southern food doesn't only come from European and Native American cultures. Many of the vegetables, fruits, and grains eaten in the South today came from Africa. In the 1600s, the first Africans arrived on the shores of North America. They came against their will and were sold into slavery. These Africans brought their own food with them across the Atlantic Ocean. Lots of delicious vegetables, legumes, fruits, and grains grew in Africa. Yams, black-eyed peas, watermelon, and some kinds of rice all came from Africa. As more and more Africans were brought to North America as slaves, African produce took root in American soil. Most of the slaves in the United States were in the South. So rice fields covered the wet marshlands along the coast of South Carolina. Black-eyed peas sprung up across the Deep South, from Georgia to Alabama.

Slavery in the United States lasted until 1865, when the 13th Amendment abolished slavery. After the end of slavery, many African Americans continued to live in the Southern states. Over time, the food culture of African Americans and European Americans in the South grew closer, and became what we now call "Southern food."

In time, the produce from Europe, Africa, and America were grown side by side in gardens and fields. The different produce also found their way onto the dinner plate together. Think about what was on that plate of food at Martha Lou's Southern food restaurant: stewed okra, turnip greens, fried chicken, and cornbread. Each produce item came from a different place. Okra came from Africa. Turnip greens came from Northern Europe. And cornbread? Native Americans were making something like cornbread long before European settlers arrived in North America, and the European settlers made their own version of European breads using corn instead of the wheat they had used on their home continent.

Southern food spread throughout the United States when African Americans from the South moved to major cities across the country. From 1900 to 1970, more than 6 million African Americans moved to big American cities in the North, Midwest, and West. They left the South

to seek fair treatment and more opportunities. They brought with them the foods and traditions of their past home.

Southern food traditions are still changing today. As new immigrants from other parts of the world move to the United States, they bring their own food traditions. There are now Asian-Southern restaurants in Atlanta and Caribbean soul restaurants in New York City. New patterns of migration and trade will change the foods that we eat and create new cuisines.



# From City to Farm

by Samantha Gross



Jason Detzel was bored with his work as a psychologist for the United States Air Force, and he was tired of spending all day in an office. Many people enjoy working in an office environment with computers, but Dr. Detzel felt that in the city he was losing touch with something important. So the Richmond, Virginia, resident quit his job and started a farm.

He and his business partner found 80 acres of available land in a small town called Claverack, N.Y., and signed a 10-year lease. They bought hammers, crowbars, nails, and wood. While some farms used a lot of machinery, they decided they wanted to do as much as possible with their own hands. They built a corral for the cows so that the cows would stay inside the pasture where they could move around and graze. They built pig shelters where the pigs could be protected from the weather in the winter. They built a house for the chickens where the hens could lay eggs and Dr. Detzel could collect them.

After almost a year and a half, Diamond Hills Farm had grown to include 10 pigs and 20 cows, including a baby calf that Dr. Detzel was feeding with a bottle. The farm was also home to 100 laying hens, which provided eggs, and 100 other chickens that would be used for their meat. After many months of growth, Dr. Detzel felt like he'd already made something important-both for himself and for the land he and his partner owned.

"I'm definitely happier being out in the fields with my animals. Even if there are bad days, I'm still happy," Dr. Detzel said. "When you're inside all day, you don't get to see nature working."

After starting the farm, Dr. Detzel began seeing many aspects of nature at work. Instead of driving around the farm, he usually walked, and he could feel the texture of the earth beneath his boots. In the winter, the

farm became a blinding sea of white. In the summer, it turned into a lush sea of green. Dr. Detzel's work didn't bore him anymore.

"The job is different every day on the farm. It's amazing," he said. "You're a farmer. You're a veterinarian. You're a plumber. You're definitely a carpenter a lot. With animal husbandry, all that stuff is different every day on the farm. You're a jack of all trades, master of none. That's what I like about it."

As a farmer focusing on raising animals, one of Dr. Detzel's most important tasks was to grow a lot of healthy grass for the animals to eat. Each morning, he rang a bell to let the cows know it was time to move to another section of the corral in another part of the pasture where there was plenty to eat. The droppings, left by the cows and chickens that followed behind them, helped grow more green grass to replace what the cows had eaten.

Learning how to manage the animals had been one of the biggest challenges of starting the farm, Dr. Detzel said. He learned that it was important to stick to a routine. That's why he rang the same bell and called to the cows in the same way each day. The routine helped keep the cows calm and cooperative.

"They weigh much more than I do, and they could push through much, much bigger things than I could ever build," he said of his animals. "So it's a matter of keeping them where you want them by keeping them happy."

The cows were most happy, he knew, if they were someplace with lots of good water and plenty of healthy grass. If they weren't satisfied with the amount of grass in a pasture, they always let him know with their loud mooing.

It wasn't easy for Dr. Detzel to be accepted by the other farmers in his community. With all his tattoos, he looked very different. When he started the farm he was in his early 30s, while most other farmers were older. There weren't many young people starting farms, because it had become harder and harder for small family farms to make much income.

Dr. Detzel said that had begun to change when more people became locavores. A locavore is someone who tries to eat food grown and raised nearby. By shopping at their local farmers market, many locavores hope to reduce the amount of energy used to ship food long distances. Many locavores like knowing where their food comes from and being able to talk to the farmers about what chemicals were used and how the animals were treated. Some locavores say food that travels less and spends less time in storage tastes much better.

Dr. Detzel likes his new job, but it's much harder to make money. As of July 2013, he was working two jobs -40 hours a week at a local deli and 35 hours or so each week on the farm. But he says it's worth it. "I'm much happier," he said.

# Farmers Farm

by ReadWorks



Business people do business, musicians make music, teachers teach, and farmers farm. Right? Yes, but there have been times when a farmer's right to farm has come under attack. You might be thinking, "How can someone be prohibited from pursuing his or her occupation?"

Farmers generally sow seeds in rural land: land that is far from cities. They need the open space, as many farms are very large, spanning over 400 acres on average-that's over 300 football fields! And some cover even more ground; corn farms considered "large" must be over 500 acres!

Farms also come with their share of smells and sounds that aren't always pleasant. Drive past a dairy farm or a pig farm on a hot summer day, and you'll understand! Farming in rural areas typically means farming near fewer people, so neighbors don't have to worry about waking up to tractors coughing and roosters crowing right next door.

There is a current trend of people looking for a break from the noise and other troubles of cities, which sometimes means moving to the country; however, they may face different kinds



of noise and troubles in rural communities. For example, big feedlots, where hundreds of cattle and thousands of chickens are raised, are noisy, smelly, dirty operations. Farm equipment can also be noisy. Wide croplands can mean lots of dust and pollen in drier times, which can aggravate sensitive lungs.

Some people get angry about these things and sue farmers based on public or private nuisance laws. A nuisance is someone or something that infringes on a person's ability to enjoy his or her property, or that threatens the health and safety of a community.

Farm practices that are unregulated or dangerous and cause harm to the public-contamination of water supplies, for example-are definitely taken seriously in court. However, farmers often find themselves under attack for things that are simply facts of life on a farm. These "nuisance" lawsuits became so prevalent across the United States that farmers were beginning to suffer. Being forced to change standard practices or relocate feedlots or fields can hurt a farmer's business.

So, lawmakers began to create protective measures in favor of farmers. These are called "right to farm" laws, and they are now enacted in every state. Essentially, they are what they sound like: laws that protect a farmer's right to conduct his or her business. How do they do that?

Right to farm laws start by informing residents about the presence of a farm and its farming methods. The right to farm laws let the public know that farms do affect surrounding areas and that, to some degree, these effects must be accepted by people living near a farm. The laws also inform residents about the limitations of local nuisance ordinances, letting people know what is or is not considered a reasonable complaint.

Right to farm laws do not completely shield farms from lawsuits. Before action can be taken against a farmer, however, a court must ask some important questions: What is the degree of harm being caused? Does the activity in question threaten health, or is it just inconvenient? Are effects of the purportedly damaging activity lasting or temporary? How long has the farm been practicing its methods without coming under criticism?

These are important factors upon which a court evaluates a case. If a farmer has been contaminating water supplies and causing excess pollution, thereby harming the community, that farmer may indeed have to change his or her ways.

But if the farmer's techniques have done nothing but keep a neighbor from a backyard barbecue because of the smell of manure or noise of machines, then the neighbor might just have to get used to living in the country!

# Sticky Fingers, Helping Hands

by ReadWorks



Who doesn't enjoy a chocolate bar?

Okay, maybe not everyone loves chocolate, but a lot of people do. No matter the vehicle-ice cream, cake, as a beverage, or simply in a candy bar-chocolate is enjoyed by millions of Americans. It's readily available, too; all you have to do for a taste is visit a corner market or a drug store, and you'll find a shelf of various chocolate bars waiting.

A lot goes into a chocolate bar, though, and ultimately, its origins trace back further than the grocery store checkout line. Your favorite Halloween candy has roots even deeper than the company that manufactured it. The next time you get to indulge, take a look at the candy wrapper. What's the most important ingredient in a chocolate bar, the one that makes chocolate...well, chocolaty? It's cocoa.

The origins of that corner-store chocolate bar start in fields along the Equator, in countries in South America, Africa, and South Asia. Cocoa comes from the seeds of cacao trees, which thrive in hot, humid climates. This is why most of the world's supply comes from places like Ghana or Nigeria in West Africa. Some cocoa is harvested in countries like Brazil, near the cacao tree's original habitat.

Chocolate farming may sound like a dream job, but unfortunately, the reality of life on a cocoa

farm is less than idyllic. Cocoa farms are usually located in small villages in remote areas of countries that are still developing a lot of the luxuries taken for granted by people who live in first world countries: running water, reliable electricity, accessible education, and so on.

The demand for chocolate throughout the world is high, so farmers work extremely hard to pick cocoa pods. The average workday hours an American may be used to do not apply on these farms-workers don't get scheduled breaks or eight-hour shifts. Laws restricting child labor don't apply here, either. Some cocoa farms use slave labor, buying and selling people as young as children to work long days in dangerous conditions.

Additionally, many of these cocoa farmers aren't making much money, even though the world population loves its chocolate! Sometimes, greedy middlemen-a term for the marketers and salespeople who buy cocoa pods from farmers and sell them to chocolate makers around the world-buy for very little and sell for a much higher price. This means the traders are the ones making money, instead of the farmers.

As people involved in the global trade of cocoa began to find out about the slavery, child exploitation, and unsafe conditions on cocoa farms, they started to demand change. National and international regulations emerged to help regulate the labor and trade of other crops, such as coffee and tea. Cocoa joined the list of commodities that could be "fair trade."

Fair trade is a term that applies to anything farmed or made and traded, usually from small communities in developing countries to bigger communities with first world economies. The fair trade movement aims to fix the ugly scenarios on places like cocoa farms: lots of hard work, no access to medicine, not enough food, and definitely no fair pay.

To be certified as a fair trade product, a farm must adhere to some important rules. First of all, farming practices must be earth-friendly. Sustainability is a big issue for farmers worldwide, and fair trade organizations take it seriously. If a farm can't treat the land well, will it also treat its workers poorly?

Then, the concept of fair trade requires living and work conditions for laborers that are safe and clean. Fair trade certified operations promise better lives for the people doing the work. Fair trade organizations also prohibit the use of child labor and fight back against slave trafficking.

Finally (and this is where the "fair" part of fair trade really comes in), fairly traded products typically sell at higher prices to consumers so that the producers-the cocoa farmers-are getting paid a fair amount, often designated by the country's minimum wage.

Becoming fair trade certified is a process, and certification is sometimes expensive. However,

once an operation is fair trade certified, the farmers start to earn more money, as their products sell at a higher price. With increased profits, working conditions will also improve.

How can you tell the difference between fair trade chocolate and something that isn't? Look at the label on the candy you're about to enjoy. If there's a symbol on it that reads "Fair Trade Certified," you'll know that the cocoa in your chocolate bar didn't come from a farm that hurts its workers-and that's definitely something sweet.



# Healthy Eating, Healthy Planet

by ReadWorks



## BEING HUMAN

Humans are unlike any other animal on Earth. Our unique brains and bodies allow us to use the world's resources in ways no other animal can. No other animal can claim it's been to the bottom of the deepest ocean, to the top of the tallest mountain, *and* even up and out of Earth to the moon. On a simpler level, do you know of any animal that can build a two-story, single-family brick home with an attached garage?

Or just make one of the toilets in the house?

While exercising our profound abilities (like making toilet bowls), we have fundamentally changed our planet and, in many ways, we've made it *our* planet. We've cut down entire

forests to construct towns and cities. We've replaced the trees and plants with buildings, and paved over the forest floor with roads. These activities help us live, but they also create pollution that affects the air we breathe and the water we drink.

## **EATING FOR A HEALTHIER PLANET**

Luckily, we can reduce the impact our activities have on the planet. One such activity is growing food. Think of all the land, equipment and work that go into a potato farm, an apple orchard or a cattle operation. By eating the right foods grown in the right way, we can limit the effects our farms and ranches have on the environment and eat our way to a healthier planet!

### **EAT LIKE SQUIRRELS**

A great way to limit your impact on the planet is to follow other animals' way of eating. Squirrels, for instance, eat nuts found close to their tree house. Elephants eat the trees and bushes that grow around them. Killer whales eat the fish swimming with (and away!) from them. What these animals are doing is eating in-season and locally. We can do the same.

### **EAT IN-SEASON**

Most of our favorite fruits and vegetables don't grow year-round and have their own natural season. Modern farming techniques have changed that, and we can have almost anything any time of the year. But when this produce is grown during its natural off-season, it may not taste the same. If we eat with our foods' natural seasons, we are eating in sync with nature.

### **EAT LOCALLY**

Eating locally means consuming produce that is grown close to your home. It will definitely limit your choices, but it will ultimately lower the impact you and your eating habits have on the environment. An easy way to get local produce is to shop at a nearby farmer's market.

Love to eat grapes? Well, you can eat them in-season and locally...if you moved around the world a lot to follow the seasons! Grapes are a summer fruit so during the winter, many northern American supermarkets buy them from farmers in Chile, which is more than 4,000 miles away!

### **GROW YOUR OWN**

One of the best things you can do to be a lower-impact animal is grow your own food. It may seem like a lot of work but people and communities all over the country grow some or all of their own food. There are many benefits to growing your own food.

One benefit is just learning about where your food comes from. Most produce found in your grocery store has stickers or signs that tell you where it was grown. Let's say you pick up a tomato and learn the tomato was grown hundreds of miles away before getting into your hand. If you grew a tomato in your backyard, school or local community garden, not only would you save a trip to the grocery store, you would save that tomato a long trip, and the planet a lot of resources.

Another benefit of growing your own food is that your food is fresher. It can take weeks for produce to get from the farm to your supermarket. By growing your own food, those weeks become just days, hours or even seconds. Now that's fresh!

## **COMMUNITY**

When you buy food that is grown locally, you're also supporting your own community. The money you spend goes toward your neighbors' jobs and businesses and keeps your community strong and unique.

## **HEALTHY EATING, HEALTHY PLANET**

Although human activities alter the planet, there are many things we can do to limit our impact. The impact of growing and raising our food on the planet is high but by eating locally, in-season, and even growing our own food, we can make the planet a better place while eating great food!

# Bring in the Beavers!

by ReadWorks



It was the fifth straight day of heavy rain in the town of Leith. If it kept on pouring for much longer, the river would swell with rainwater and flood the town. All the citizens of Leith would have to flee their homes and find safety on higher ground. Anna and her parents stayed glued to the television set, nervously listening to the weather reports.

For now, the weatherman said, the situation was still safe, but helicopters were ready to lift people away at any moment if the rain did not stop soon. Anna felt her palms grow sweaty as she saw the frightened expressions on her parents' faces. Her parents never looked scared. They were used to the rain, since Leith was located in the rainy country of Scotland, but it had never, ever poured like this before. The town had cancelled school in case of a sudden emergency, so all Anna could do was try to read her favorite detective stories and hope for the rain to stop. Luckily, it did. When she awoke the next morning the skies were sunny and clear. It was a miracle. They had been spared from a terrible natural disaster.

Everybody in Leith breathed a great sigh of relief, but they knew they had to take action. Nobody wanted to face this flooding danger again. The day after the downpour stopped, the Mayor of Leith called a town meeting. Anna went along with her parents to find out more. She really did not want all her books and toys, and her pet dog Noodles, to get washed away in a flood.

At the meeting, the Mayor presented three experts who had different ideas about solving the problem. One man suggested they build a concrete dam upstream to block the river's path. With such a big dam,



the river would never overflow into Leith, even in heavy rain. Another lady suggested building a different structure, a high stone wall all around Leith to stop floodwater from getting in. The last speaker, a small, slender man with a heavy Scottish accent, had what seemed to be the craziest idea of all.

"You see," he said, "if we just bring some beavers back into our landscape, we might be able to kiss our problem goodbye. About 400 years ago, there were thousands of beavers roaming around the Scottish countryside. Our ancestors killed most of them off because they enjoyed hunting them for their warm fur. What our ancestors didn't realize was that we need to keep beavers alive for our own safety. The beaver builds dams in the rivers out of sticks, mud, and leaves. These dams are strong enough to stop a river from flooding in heavy rain. If we bring the beavers back, we can solve our problem by working with nature."

After the three experts spoke, the Mayor asked the citizens of the town to think for a week and then vote for the best plan. Anna's father said, "That last guy is crazy. He thinks he can solve the flooding problem with beavers? Really, how silly."

Anna's mother looked very thoughtful. "You know, Fred," she said. "It's worth a try. What harm can it do? If workmen build just one concrete dam or a stone wall, it won't be as useful as several dams built by the beavers. And besides, beavers are very cute, and they build beautiful dams out of things they find in the forest. Concrete dams are not nearly as beautiful."

There was much whispering and discussing all over town until the final vote was cast. Anna secretly hoped that the beaver plan would win. She had always wanted to see a beaver in real life. Since Leith was in the countryside, and everyone in town loved nature and animals, Anna suspected that the rest of the town might be on her side. When the vote finally came in, Anna was proven right. They would bring in the beavers!

Over the next two years, scientists brought beavers in from other parts of Scotland, and set them free upstream and in the countryside around Leith. Everyone noticed a difference. It rained and rained, but the river did not even come close to overflowing because of three dams the busy beavers had already made. For her fourth grade field trip, Anna's teacher brought her class into the countryside to see the beavers at work. They watched in awe as the furry creatures hurried back and forth from the dam carrying twigs and bark in their claws.

Beavers almost seemed like furry, cute little people. Before they left, Anna and her classmates shouted out a loud "thank you" to their animal friends for saving their town.

# What's This? One Big Bite

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



© AMNH/R.Mickens

Food can be hard to find in the deep sea, where there's too little sunlight for plants to grow. Some hungry predators lurk and wait - then swallow their prey whole.

The **black swallower** can gulp down prey 10 times its own weight, bones and all. The swallower's rows of large, pointed teeth fold back to make room in its mouth and throat. Once inside, the prey is trapped in the swallower's elastic stomach, where it's slowly digested.

# What's This? One Terrific Tongue

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



Photo by Dori (CC BY-SA 3.0 license)

Your tongue is an amazing feature. You depend on this bundle of muscles to take in, taste, and swallow food.

Some animals, like the **giant anteater**, use their tongues to hunt. Anteaters raid anthills and termite mounds with their nozzle-shaped snouts. Their long, sticky tongues extend nearly two feet (61 centimeters) beyond the tip of the snout to pick up insects. With such a long snout and tongue, the anteater can feed while standing back from a nest and avoid getting bitten or stung.

# What's This? Super-Sized Appetite

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



Photo Courtesy of L.Herman/NOAA

*The blue whale is the largest animal ever to have lived on Earth. It's even bigger than the enormous dinosaurs that lived over 65 million years ago! Blue whales migrate long distances, traveling alone or in small groups called pods. These colossal creatures breed in warm southern waters during the winter and feed in polar seas during the spring and summer.*

It's no surprise that the world's largest animal has an enormous appetite. The **blue whale** needs about 8,000 pounds of food a day during its summer feeding season.

But this giant's diet is made up of the some of the ocean's tiniest creatures: shrimp-like animals called krill. To feed, the whale gulps down huge amounts of water, then filters out the krill using its fine, comb-like baleen plates. It takes about 40 million krill a day to satisfy the blue whale's appetite!



# What's This? Packs a Punch

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



Photo by Silke Baron (CC BY 2.0 license)

In order to eat, predators must first strike, bite, or poison their prey. And no other animal strikes faster than the **mantis shrimp**.

This tropical shellfish punches prey with a pair of limbs it keeps folded under its body. When released, these spring-loaded weapons swing at speeds up to 50 miles (80 kilometers) per hour. The force is strong enough to shatter shells and sometimes even aquarium glass. Some mantis shrimp arms are tipped with spines for lightning-quick stabbing.

# What's This? Iron Grip

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



Photo by Jonathan Wilkins (CC BY-SA 3.0 license)

The **harpy eagle** is one of the world's largest birds of prey. With claws as long as a grizzly bear's, this eagle hunts sloths, monkeys and other mammals.

It uses its powerful talons to pluck prey from rainforest branches, puncturing the animal's organs as it flies to the top of a tree. Then, pinning the prey with its feet, it tears away bits of flesh with its beak to eat or feed its young. Its grip is strong enough to catch and carry an animal close to its own body-weight - up to 20 pounds (nine kilograms)!

# What's This? Rafflesia Plant

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



Photo by Rendra Regen Rais (CC BY-SA 3.0 license)

This is the flower of a *Rafflesia* plant.

The brilliant, red bloom of the *Rafflesia* plant is the largest flower in the world, growing up to three feet across.

And yet this rare rainforest plant doesn't have any leaves, stems, or roots. That's because it's a parasite: it feeds off its host, a type of grape vine. It attaches itself to the vine and draws all the nutrients and water it needs to survive. It also smells like rotting flesh, which is why it's also called the "corpse flower."

# No Time for the Blues

by ReadWorks



Ellie was busy tuning her guitar when her older brother, Chris, knocked on her door. "You ready to go?" he mumbled. The house had been more quiet than usual, so she assumed that he had just gotten up from a nap. Chris couldn't stand silence, so when he was awake, his speakers were constantly blaring whatever he was in the mood for that day. She had woken up to hip hop that morning, classical the day before. Ellie picked up her guitar, placed it in her case-battered by years of use and covered in aging bumper stickers-and ran out after Chris.

Even though she was on her way to perform at her first concert in New York City, she could hardly muster up any excitement. All that was on her mind was her best friend, Dmitry. Just 24 hours prior, he had moved all the way to Santiago, Chile, as a result of his mother's job. She wanted to do research at the university there, and it would take her a few years. Ellie and Dmitry only had two more years of high school, but there was no way for him to stay in the United States. So the two were forced to say their good-byes, saving their tears for behind closed doors. Each had promised to stay in touch, to email the other at least once a week, providing the necessary details of their junior and senior years.

So as Ellie stepped on stage and arranged her fingers on the guitar strings, she didn't notice the piercing red lights that lit her and her bandmates. She barely heard the cheers coming from her friends and family in the crowd. She also paid little attention to the flash of Chris's camera as he snapped pictures of her band, Alphabet Soup. But as soon as Jordan, the drummer, signaled the beginning of the first song with the clicks of her drumsticks, Ellie was tugged back to the present. The first number was a piece that Dmitry had taught her years ago, when she had finally mastered the basic jazz chords. He was her first guitar teacher, and her favorite one. The "F" chord took her a while to learn, as it required tricky finger placement



-at least if you did it the "proper" way, as Dmitry would say. However, once she was able to add the chord to her repertoire, an entire new world of music opened to her. She chose to specialize in jazz because of Chris's love of the genre-he often was in the mood for swinging tempos and blaring horns, so that's what she usually heard in the hallway while growing up.

Soon, it was time for the band to take a five-minute break. Ellie hadn't even paid much attention to the songs they had just played-it all came to her as naturally as brushing her teeth. As her bandmates left the stage, they all high-fived each other, satisfied with their performance and the audience's applause.

Jackson, the lead singer, approached Ellie. He'd noticed something was off about her. "Everything okay?" he asked.

"Yeah, don't worry. I'm fine," she assured him.

His eyes expressed his concern, but he didn't have much time to talk to her. He figured it could wait until after the concert. Ellie pulled her phone out of her pocket, and to her surprise, she noticed a text message from Dmitry. "Wishing you the best of luck tonight! You better make me proud," it read.

She smiled at the screen. Ellie figured that Dmitry wouldn't want her to be sad during her first performance in New York City, so she stepped back on stage with a renewed energy. This time, she smiled at Chris's camera and waved to the audience, generating more cheers from strangers, friends, and family. She joined in when Jackson sang the chorus, and he turned back to look at her, surprised and pleased. The next time Dmitry was in town, she would play a concert just like this one and make him proud.

# The Bagpipe

by ReadWorks

The bagpipe is a popular wind instrument in European countries. Prior to the 15th century, bagpipes were used as folk instruments. They were later used in the court and on the battlefield. Although people debate the origin of the bagpipe, everyone agrees that the bagpipe is important to Scotland. In fact, the bagpipe is the national instrument of Scotland!

A bagpipe's structure is very unique. Rather than the instrument immediately using blown air to produce sound, the air is stored in a bag. Because the bagpipe uses the stored air to produce sound, it is able to produce a constant sound.

One part of the bagpipe is the blowstick or blow pipe. A player uses the blowstick to blow air into the instrument's bag. As the bagpipe uses the stored air, the player needs to continue blowing into the blowstick to replace the air that has been used.

After the bag has been filled with air, the player can start to play a song with the chanter, which is a pipe that produces different notes. Holes are drilled along the chanter, and the player uses these holes to control the notes produced by the bagpipe.



*photograph of a bagpipe player*

# The Cajon

by ReadWorks

The cajon is a percussive instrument that was developed by African slaves during the slave trade. When Africans were being forcefully transported from their home continent to South America, they wanted to be able to play the music of their homeland. By slapping the shipping crates on the boat, they could recreate a similar noise to that of West African drums. This transformation of available materials attests to their creativity, but also to their cunning. The masters of the ship did not allow the slaves to play music, but the drums could easily be stowed away and disguised as simple crates.

The cajon is now widespread, and there are many different versions of this instrument. Depending on the region, cajons can vary in size, shape, and material. For example, the Peruvian cajon is typically made with hardwood and it produces a resonant sound, while the Flamenco cajon is made with plywood and it produces a buzzing sound.

The methods of playing cajons also differ. Some cajons can be played standing, and others require the player to sit on top of them (as shown in the picture below). With the growing popularity of the cajon, the instrument is now made with cheaper, synthetic materials, like plastic and plexiglass.



Photo Credit: SLRB, CC BY 3.0

*Photograph of man playing cajon*

# The Sitar

by ReadWorks



Photo Credit: Musicalsindia, CC BY 3.0

*photograph of a sitar*

The sitar is very popular in Bangladesh, Pakistan, and India, and it is used most frequently in the classical music of northern India. The sitar is a type of lute, a stringed instrument that usually has a long neck. The average length of a sitar neck is four feet long, and along its neck run strings for plucking and 20 frets for tuning. While all of the sitar's strings are composed of metal, they differ in purpose. There are three types of strings: the melody string, the drone string, and the sympathetic string.

The melody string is, of course, in charge of the melody. Although there are variations among the types of sitar, there are typically four melody strings, and these strings can play between three and four octaves. An octave is a measuring unit for eight notes on a musical scale.

The second type of string, the drone string, essentially determines the base rhythm of the melody. With their capacity for low pitches, drone strings provide a foundation underneath the higher-pitched melody.

While there are only one or two drone strings on a sitar, the number of sympathetic strings can reach up to 13. These strings are located underneath the frets, which are thin metal strips that run horizontally across the neck. These frets can be tuned so that the sympathetic strings only play a certain musical scale, which is called a raga.

At the end of the neck, the gourd serves as the base of the instrument and helps to accentuate the resonance of the notes being played. The sitar can be heavy, so the gourd offsets the weight of the long neck.

# The Mbira

by ReadWorks

Native to Africa, the mbira is a type of lamellophone, an instrument constructed of metal and bamboo. As you can see in the picture, the instrument can be played by pressing down on the protruding tongues, known as the lamellae. The lamellae vary in size and are connected to a soundboard. Similar to playing guitar strings, the bamboo tongues must be plucked by the player. Every time a lamella is plucked, vibrations will be released into the soundboard. This will lead to greater resonance. There are between 22 to 28 lamellae on the instrument, with each lamellae producing a different sound depending on how they have been tuned.



Photo credit: Alex Weeks, GFDL, CC-BY-SA-3.0

*photograph of a mbira*

The mbira is a very important instrument in Zimbabwe, especially for the Shona people who live there. The religion practiced by the Shona relies heavily on the mbira during religious rituals and ceremonies. Not only is the mbira used as a tool for communicating with the dead, but this instrument is also used to drive away evil. In addition to its spiritual significance, the mbira was once played for the Shona royalty. To this day, the mbira is played to welcome prosperity and good luck.



# The Lyre

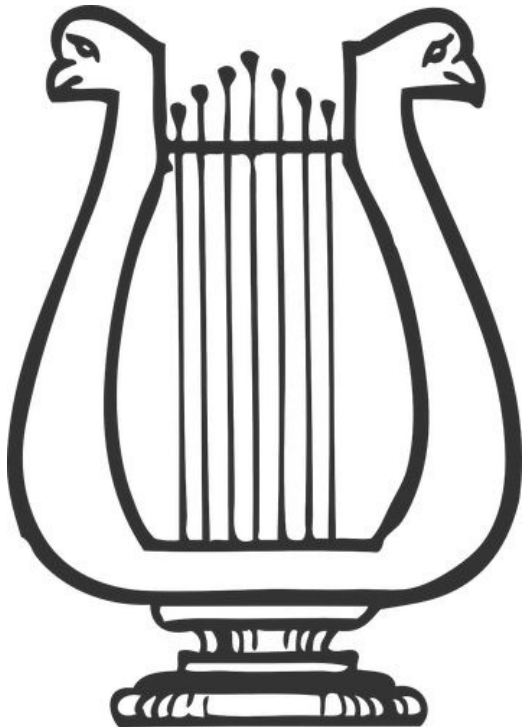
by ReadWorks

The lyre is a curved stringed instrument that is often played as accompaniment for a poetry recitation or to a solo singer. It was a very popular instrument in ancient Greece and was used in many contexts, ranging from grief-stricken funerals to wild festivals. The lyre was also used as a tool for educating the young. There are accounts of famous Greeks, like Plato, applauding the lyre as the best teaching instrument. There is also a famous tale of Achilles, a hero from Greek mythology, taking lyre lessons from a character named Cheiron.



*mosaic of a lyre player*

Another story in Greek mythology describes how the lyre was invented. According to Greek mythology, the lyre was invented by Hermes, the god whose responsibilities included travel, luck, and commerce. The origin story of the lyre recounts when Hermes used the shell and gut of a tortoise, as well as tall reeds, to create this instrument.



*illustration of a lyre*

Rather than using a tortoise, ancient Greeks were thought to have constructed their lyres out of wood, ivory, and bone, depending on the parts of the instrument. Instead of the reed strings of Hermes's lyre, most ancient Greek lyres had strings made of stretched sheep gut!

The body of the lyre is U-shaped, and multiple strings run between the bottom of the lyre and the top of the cross bar. In the pictures above and to the side, you can see what a lyre looks like. Does this instrument remind you of any others?

# The Ohe Hano Ihu

by ReadWorks

The ohe hano ihu, or hano for short, is an ancient Hawaiian nose flute made of bamboo. Can you guess what a nose flute is? If you guessed that it is an instrument you play with your nose, you were right! As opposed to the traditional flute, which plays notes with each controlled breath from the mouth, the nose flute plays notes with each blow from the nostril. (To put it bluntly, it would probably be wise to blow your nose before practicing this instrument.)

Blowing too hard into a nose flute produces an undesirable sound, while a gentler blow produces a beautiful, soft sound. In fact, it is such a pleasant noise that the hano was used during courtship in Hawaii.



GIRL PLAYING ON THE NOSE-FLUTE.

Photo credit: Thomas Williams

*illustration of a girl playing a nose flute*

The hano's length ranges from 10 to 20 inches. Its length depends on the personal preference of the player or the carver. There are three holes on the flute where the player should place his or her fingers. Each flute is handmade, and the holes are often drilled based on the player's hand size and hand placement. While the hano only plays four notes, there are many different techniques for producing unique sounds. Some of these techniques include players rolling the flute between their palms or placing one palm at the bottom of the flute to block air flow.

# The Phonograph

by Rachel Howard



Adam groaned and dropped his duffel bag and backpack heavily onto the floor of the small cabin he and his family had just entered. They would be here for almost two weeks-his dad's idea of "family bonding" and a good summer vacation. It had rained the entire five-hour drive to the cabin, and the dark gray clouds that hung low in the sky didn't seem to be drifting away. Outside was the heavily forested state park and just about nothing else-they hadn't even passed a ranger's hut for miles and miles. And there wasn't even Internet or cell service here.

"This is great!" Julia, Adam's twin sister, dropped her duffel bag onto the floor and flopped back on the old, creaky couch. She was a lot like their dad, and she couldn't think of anything more fun than hiding out in the middle of nowhere for two weeks, just spending time with family and hiking when the mood struck. She and Adam had so many differences in their personalities that he couldn't believe they had shared the same womb.

"Yeah...it's awesome," Adam said. He sat down on the couch next to her and noticed the old clunky television set on the wooden console table in front of them. His dreams of faking sick to watch daytime Major League Baseball while the rest of the family hiked around the mountains quickly died.

"Look at this!" Dad exclaimed, walking through the doorway. His hair was plastered with

water, and rain dripped down his face. "There's even a fireplace. Can't wait to get that all built up."

Mom shut the bathroom door behind her. "At least the toilets work," she muttered. Adam immediately felt a rush of goodwill and companionship toward his mom, with whom he usually fought over the TV's remote control and the family computer (the fact that he didn't have his own computer was a whole other issue).

"This is really going to be fabulous," his dad said. He swiped his hair back over his head so that it slicked back, and shook out his hands. He locked the door and got busy unpacking all of the groceries they had purchased at the mini-mart just outside the state park. Adam's mom rolled her eyes and sat between Adam and Julia on the couch.

Their mom had been kind of weird around their dad for a while now. Julia and Adam talked about it before they left. Mom seemed distant, always looking off in another direction whenever anyone asked her a question, washing clean dishes that were sitting in the drying rack...things like that.

Dad didn't want to talk about it; he just said that Mom had lots of things on her mind and that the twins should leave her alone. Adam hated when their dad brushed things under the rug like that, but Julia said it was his way of coping. She always seemed to have the answer to that sort of emotional thing.

"What's on TV?" Mom said, reaching towards the fat old-fashioned remote.

"Nuh-uh-uh!" Dad said, rushing over and pulling the remote out of her hands. "Let's just see how far we can go without watching TV, like we said, right?"

Mom leaned back on the couch and crossed her arms.

"I'm going to unpack," Julia said, standing up. She looked at Adam pointedly, and he followed her to the back of the house, where they would share the second room.

He closed the door behind him.

"Wow, there's a lot of tension in that room," she said, dropping her duffel onto the bed by the window.

"Yeah," Adam said. He liked to let Julia analyze certain situations before he formed an opinion about them. He supposed this was part of being a twin, but maybe he was just lazy.

"I just feel that Mom's been so distant lately, and Dad's been so weird about it. There has to

be something else going on, right?" Julia stood, half-looking at him across the room, with her hands on her hips. In the gloominess from the outside rain, she looked like a shorter version of their mom, but with light hair.

"Yeah," Adam said.

"What do you think it's all about?" She sat on the bed and looked at him intently.

"I don't know," Adam said truthfully. How was he supposed to try to understand his parents' world?

"Can't you contribute *anything*, Adam?" Julia hurled at him, and stomped out of the room.

Wow, Adam thought. We haven't even been here three hours, and everyone is already angry at each other. Adam fell back onto the bed and stared at the boring wooden ceiling.

He noticed a small metal door handle in the far left corner of the ceiling, obscured by a deep shadow. Adam was curious, so he pulled the bed over to the wall and reached high above to pull down on the door handle.

It opened up a wide rectangular trapdoor in the ceiling. There must be an attic up there. Adam listened hard for any noise from his family, but he heard nothing. He assumed they were all stewing in anger, his dad trying to make a remote vacation special, his mom crippled by boredom (like Adam was), and his sister annoyed that Adam had proven (once again) to be a terrible confidant and bosom buddy. He shrugged and pulled himself up, monkey-bars-style, into the attic.

It was a big square room, with two grimy windows looking north and south. The people who owned the cabin must have stored all of their personal stuff in the attic when they rented it out to people crazy enough to actually pay to stay here, Adam thought. There were cardboard boxes stacked up to the slanted ceiling and piles of old papers stacked up on old wooden tables and chairs. A mannequin with a black lacy dress huddled next to a large whitish wardrobe, and an old clock lay overturned by a few huge, ornate trunks with gold molding on the sides. Adam moved farther into the room, coughing against the dust that billowed up off the floor.

In the corner was a large machine that had an old-fashioned horn standing up out of it. Adam had seen pictures of this object before but had never seen a phonograph in real life. He walked toward it, drawn by the dusty brass horn and heavy box that held it up. He touched the scalloped edges of the horn, running his fingertip along its circumference. It was so different from sleek technology-his iPhone and flat screen TV and Wii game console-that he used



so often. This record player was not something you could just pick up and carry around in your pocket, listening to whatever music you wanted at whatever hour of the day.

Adam dusted the phonograph off with the hem of his sweatshirt, which immediately turned gray. Mom wouldn't be too happy about that. There was a brass knob on the side of the box, and Adam turned it to wind it up. Nothing happened. Adam thought it might be like a music box, and if he wound the knob the right way, it would release some kind of sound. But this didn't seem to be working. Adam stopped turning the knob and decided to try something he had only seen in cartoons: he put a sharp needle down on the black circle that had been placed on the top of the box. All of a sudden, faraway-sounding music began to play, reminding Adam of the old-time, black-and-white movies his mom used to like to watch with him and Julia when they were little. Adam sank to the old wooden floor of the attic and leaned against the wall, listening to the quiet music. He imagined people in grayscale, dancing together in circles to the music. He imagined bonnets and hoop skirts and suits. Sitting there, in the gloom and dust of the unloved attic, Adam felt transported back to another time.

After what was at least an hour, and when it finally stopped raining, Adam climbed back into the bedroom. Julia was calling for him from outside the door, her muffled voice sounding annoyed. He closed the trapdoor carefully and hoped Julia wouldn't notice it when she came in to go to sleep.

"Did you fall asleep?" Julia asked when Adam opened the door.

"No." Adam pushed past Julia to the kitchen, where his mom and dad were sitting at opposite ends of the table, waiting for the twins.

"Let's have a nice dinner," Mom said, noticing the annoyance on both of her children's faces.

They ate pasta and salad for dinner, with some chocolate cake for dessert afterwards. Everyone's moods seemed to have quieted down, and they were able to laugh with each other. Even Mom was engaged, joking around with Dad about the sad contents of the tiny mini-mart, and how she didn't know if they'd be able to survive off of canned foods and whatever they could forage from the state park.

After dinner, and after everyone else had fallen asleep, Adam thought about waking Julia up to tell her about the phonograph. After considering it for a few minutes, he decided not to. He would keep it his secret, his special place, reserved for the times his family let the tension build up and bubble around them. He would vacation in the attic with the lovely old music and drift away to another time when he needed to.