

Urban Farms

by Susannah Edelbaum



Many people wrongly think that cities don't have farms and that fruits and vegetables are only grown in the country. Believe it or not, there are more and more urban farms popping up in cities all over the world.

Alexandra Sullivan, a food systems researcher in New York City, studies urban agriculture. Urban agriculture is another name for farming and gardening in a city environment. Ms. Sullivan studies everything from tiny gardens in empty lots between buildings to bigger fields that have been planted and cultivated. According to Ms. Sullivan, "Urban agriculture has existed since cities have, across the world."

The number of humans living in urban areas, or cities, is increasing. The amount of people who want to garden in urban areas is also rising. Ms. Sullivan says, "In small gardens, on rooftops and indoors, city residents grow fruits, vegetables, grains, and herbs, and raise animals to produce dairy, eggs, honey, and meat. City residents use these foods as supplements [additions] to food produced by rural agriculture." Even though some people who live in urban areas grow crops, urban residents still need

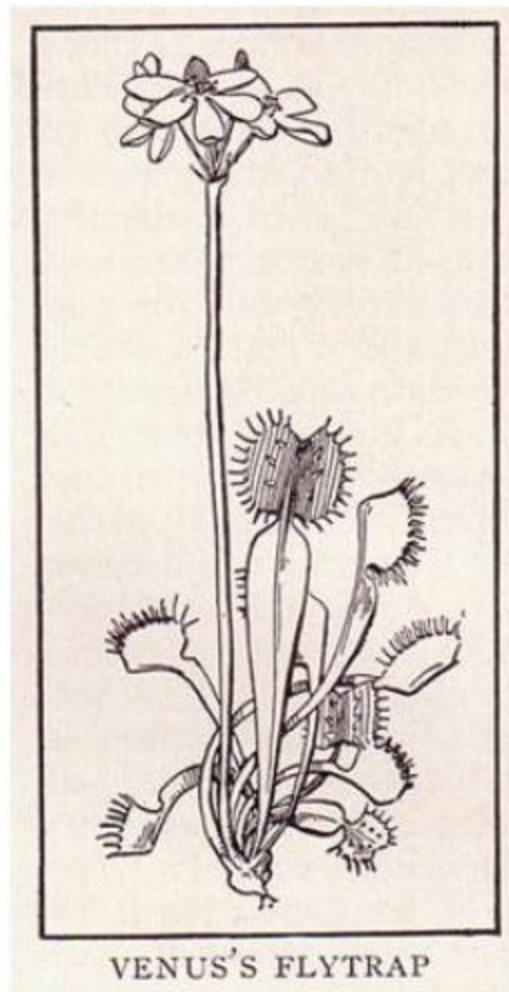
to rely on food grown in rural areas. This is because a city doesn't have enough space to grow enough food for everyone living in it.

In New York City, urban farmers have come up with many different ways to grow their own produce, even though there isn't a lot of room. For example, Brooklyn Grange is a farming operation that has two rooftop vegetable farms in New York City. All together, the farms are made up of 2.5 acres of rooftop space. This makes Brooklyn Grange one of the largest rooftop farming operations in the world.

Brooklyn Grange grows tomatoes, lettuce, peppers, kale, chard, herbs, carrots, radishes, and beans. The farming company sells its vegetables to local residents and restaurants. And because the farms are on rooftops, they are specially adapted to their urban location. They use available space that is not needed for anything else. As more urban farmers find ways to grow food in cities, urban residents will be better able to get fresher ingredients for their meals.

The Venus Flytrap

by ReadWorks



The Venus flytrap is an insect-eating plant that lives mostly on the East Coast. Found primarily in swampy parts of the United States, like North and South Carolina, the Venus flytrap has colorful pink and green hues. Like most other plants, Venus flytraps get some nutrients from the soil, but since swampy areas tend to have soil that is nutrient-poor, it is hard for the plant to get nutrients from there. As a result, the flytrap has evolved to not only rely on the soil to survive. The Venus flytrap is a carnivorous plant because it catches insects and eats them to get the nutrients that it can't get from the soil.

The Venus flytrap has leaves that open to catch prey and then snap shut once it's ready to eat. On the inside of each leaf there are short, stiff hairs called trigger hairs. When an insect touches one of the three trigger hairs on either side of the leaf twice in a row, it signals to the flytrap that dinner is here. The leaves then snap shut, trapping the insect inside. Of course, some insects are able to escape, but many don't. And if they try and struggle to get out, the trap closes even tighter! The trap doesn't close all the way, though. It stays open for a few seconds, so smaller insects that might be trapped inside with the main meal can crawl out. Venus flytraps don't like to eat small insects because they don't provide a lot of nutritional value. If it's not an insect that is trapped, rather a nut or a stone, the trap will open after about 12 hours and spit it out. The inside of a flytrap has fingerlike tentacles

that help keep the insect from escaping. If you fold your hands together and lace your fingers on the inside, you'll get an idea of what the trap looks like.

In order to digest or eat the insect, the flytrap must squeeze its prey very tightly, as digestive juices dissolve the inside of the insect. At the end of this process, which takes anywhere from 5 to 12 days, the trap opens up again, and either rain or wind will carry the insect's remaining exoskeleton away. If the flytrap has caught an insect that is too big, and, say, the legs of the bug are sticking out of the trap, the digestion process might not happen the way it should. The trap will grow mold and once that happens, it will continue to get sicker and sicker, with the trap eventually turning black and falling off.

The exact amount of time it takes for the trap to open back up again depends on a variety of factors. These factors include the size of the insect, temperature, how old the trap is, and how many times the plant has gone through this process. In fact, the trap can only catch about three of its prey before it turns black, dies, and falls off. The trap can only open and close about seven times; that is why it is important to not go around touching the trap in order to get them to close. So if you ever see one, don't tease it!

Rhubarb Grows in the Dark

by ReadWorks



Marco Pierre White was England's first celebrity chef. He was the first Briton to win three Michelin stars. He was the first chef to make British cooking stylish.

In 2008, White filmed a four-part television program about British food. In the first episode he stops at a Yorkshire Rhubarb farm. White grew up in Leeds, so he knows Yorkshire County well. On the drive to the farm, White remarks that he remembered a time when every home in Yorkshire had a rhubarb patch.

White was nostalgic for a particularly British culinary tradition. Yorkshire, England has long been known for its early season rhubarb. White was on his way to see Janet Oldroyd Hulme, a woman who has become known as the "High Priestess of Rhubarb." Hulme runs E. Oldroyd and Sons, a fifth generation farm in Carlton, England. E. Oldroyd and Sons specializes in early rhubarb. The farm is near the Rhubarb Triangle, a 9-square-mile area that has been awarded a Protected Designation of Origin status for its role in British culinary and agricultural history. At one time there were over 200 growers in the area and they produced 90 percent of the world's winter rhubarb.

Rhubarb is a vegetable, although it is considered a fruit in the United States for legal reasons. It is

native to Siberia and arrived in Britain in the 13th century. Valued for its medicinal applications, only the rhubarb root was used for centuries. The plant's red stalks and dark green leaves were bitter and considered inedible. (The leaves contain a high amount of oxalic acid, which can be poisonous.)

These days the rhubarb stalk is used in pies, puddings and sauces. It's sweet, but not too sweet. To make rhubarb pie filling, you cut the rhubarb into inch-long pieces and simmer it with some water, sugar and jam.

Rhubarb has become an ingredient of traditional British food. For his television program, Chef White visited Hulme to talk about rhubarb's transformation. He arrived at her farm and surprised her in a packing room where she was boxing up bright red stalks of rhubarb for shipment. After they introduced themselves, Hulme took White into one of her wooden rhubarb sheds. She opened a low door, and the two of them ducked under the lintel and through a plastic screen. Holding a flashlight and leading the way, Hulme said, "Step into my secret world."

Inside the shed were rows and rows of rhubarb stalks growing out of potting boxes. Everywhere bright red stalks topped with small yellow leaves were reaching for the ceiling. The room was dark except for the light of a few candles. It was also quiet. White likened the space to a church. Of course, Hulme's shed is hardly a church. But it is full of a vital energy. Perhaps this is why Hulme is described as a priestess.

The word priestess also implies Hulme has a special power. Indeed, Hulme uses the shed to produce rhubarb using a classic English technique called *forcing*. Forcing means inducing the plant to grow according to the grower's schedule. Forcing was widely used in England during the 19th century. Gardeners covered plants with large terra cotta pots, called forcing pots, or brought plants into dark cellars. The process was applied to flowering plants and vegetables.

It was a happy accident that extended this process to rhubarb. At the beginning of the 19th century, rhubarb was cultivated at the Chelsea Physic Garden in London. The stalk and leaves were not used at all. Legend has it that in 1817, workmen accidentally covered rhubarb roots with soil. Weeks later, the soil was removed and someone noticed delicate pink shoots of rhubarb stalks growing from the roots. These stalks were discovered to be much less astringent than the typical rhubarb stalks.

Horticulturalists took note of this development and began experimenting with alternative methods of growing rhubarb plants. *The Royal Horticultural Society of Great Britain's Quarterly Journal of Art, Science and Literature* records an account of forced rhubarb cultivation in its 23rd Volume, dated 1827. On March 6th it states:

A paper from the Society's gardener was read, upon the best method of forcing rhubarb for tarts and fine specimen of the leaves, forced in this manner, were placed upon the table. The method was simply this: The seed is sown in a rich border, in the first week of April; the young plants are kept thin and clean during the summer, and before the growing season is fully over, they are taken up, put into common forcing pots, three in each, and placed in a shaded border till they are wanted. In January or February they are put in the forcing-house and submitted to a very gentle heat. This is the most simple, effectual, and certain method of forcing rhubarb yet known.

The English quickly developed an appetite for rhubarb. Thanks to forcing, it became one of the only fresh foods available at the beginning of spring. It soon became one of the most popular vegetables available. Yorkshire was an ideal location for large-scale cultivation. Local coal mines provided an

energy source for heating the forcing sheds. Farmers used the local wool industry's wool waste, an excellent source of nitrogen, to fertilize their fields. By the end of the 19th century Yorkshire rhubarb was big business. There was a special express train run from Yorkshire to London between Christmas and Easter.

Not much has changed at the surviving Yorkshire forcing sheds since the 1820s. In today's rhubarb farms, like those owned by Hulme, the plants spend two years out in the open, absorbing sunshine and storing energy. The energy is stored as carbohydrates in the plants' roots. After two years, the plants are moved into the forcing shed.

The rhubarb sheds are kept warm and very dark. This tricks the rhubarb roots into growing to full size within a few weeks. These conditions trick the rhubarb plants into acting like seeds. Seeds start in the same conditions - it's warm and dark in the earth - and use their stored sugars as energy to grow out of the ground and towards the sun. The rhubarb plants in the forcing sheds "think" they are back in the ground. They grow upwards, trying to get to the sun, and put the energy that would normally be used for growing leaves into growing tall. Visitors to the forcing sheds of Yorkshire say they can hear the sound of popping as the rhubarb stalks emerge from the bud. Weeks later, the rhubarb is harvested by hand. Harvesters work in the candlelight, prying the arm-length rhubarb stalks from their roots. By the end of the harvest, usually in March, the root stock is spent and used as compost.

Forcing a plant deprives it of photosynthesis and weakens the plant. In the case of rhubarb, however, the effects of forcing have positive outcomes for culinary uses. The rhubarb plants grown in the dark, relying on stored energy, put their energy to use growing stalks, not leaves. (The leaves they grow are a pale yellow and atrophied in comparison to rhubarb grown outdoors.) If there were sunlight present, the plants would grow leaves to absorb sunlight. Since there is not any light present in the forcing shed, the rhubarb puts its energy to use growing longer stalks. As a result, the stalks are sweeter.

Chef White got his rhubarb from Hulme that day. He seems to have liked it. In 2011 Marco Pierre White was serving rhubarb crumble in his Dublin restaurant. The ingredients for the dessert were rhubarb, flour, butter, sugar, and almonds. It's served with ice cream.

Top Crops

Rooftop gardens are blossoming across the country.

Most kids would say "No way!" to attending school during summer vacation. But the students at the Ernestine C. Reems Academy of Technology and Arts in Oakland, Calif., do it-and they love it. They spend the time pursuing higher education-tending the school's rooftop garden.



David Hanks

Students from the Ernestine C. Reems Academy and people from the local community gathered for a photo after building planters and planting vegetables on the academy's roof.

For three years now, Reems students and teachers have grown flowers and vegetables on the roof. This year, they added eight more garden beds. "It's continuing to grow and flourish," says the school's principal, Lisa Blair.

In addition to learning **horticulture** (the science of caring for gardens), the students have had lessons in cooking their freshly grown vegetables. And they've learned about "the relationship between Earth and man," says Blair.

Keeping Cool

Green roofs (rooftop gardens) are becoming very popular. There are thousands of them in the United States. They do more than yield flowers, herbs, and vegetables. They help keep buildings cool. In the summer, rooftop temperatures can reach a scorching 80 degrees Celsius (176 degrees Fahrenheit). A green roof can cut that temperature in half. That saves energy that would otherwise be used to air-condition the building.

Green roofs reduce pollution too. Normally, rainwater spills off buildings onto roads and other

concrete surfaces. The water then picks up dirt and chemicals and flushes them into rivers and lakes. That unclean water, called **storm water runoff**, is a major source of water pollution. Rooftop gardens soak up rainwater, reducing runoff.

In cities, where green space may be limited, rooftop gardens also give people a place to connect with nature. And they provide homes for bugs, birds, and other wildlife.

Dirty Job

Rooftop gardens can be planted with grasses, cacti, shrubs, trees, and more. The Reems students are focusing on vegetables-corn, broccoli, kale, and squash. Every year, they harvest about 32 kilograms (70 pounds) of veggies. This spring, they hope to grow enough to sell some produce at local farmers markets, Blair says.

Tending a garden is hard work. You have to water the plants, pull weeds, and tend the soil. "The biggest challenge is moving the dirt and the wood up to the top floor, because there's no elevator," Blair says.

Though the Reems students are getting their hands dirty, it's worth every minute, says Blair. "It has been a success," she adds, "and the students love it."

Secrets of Survival: The Ancient Utah Juniper

by Mimi Jorling



Utah Juniper range map

Junipers are trees and shrubs in the genus *Juniperus*. They are in a class of trees called conifers, which means they have needle or scale-like leaves and their seeds and pollen are grown in cones. Other conifers are yews, spruce, and pine. They are mostly evergreen, meaning they do not lose their leaves, but stay green all year. Conifers you might be familiar with are the pines and spruces that are commonly used as Christmas trees. Different types of junipers grow all over the world. Humans have admired them and used their wood and berries for thousands of years.

The Utah Juniper (*Juniperus osteosperma*) is one of many types of junipers that grow in the western part of the United States, from Montana and Idaho through Nevada, California, Utah, and Colorado, and down to Arizona and New Mexico. Utah Junipers grow in very arid (dry) environments. They live on rocky slopes where there is not much rain. Strong winds blow, which can dry them out even more. The wind also sweeps away, or erodes, soil and pushes relentlessly against the juniper's trunk. Intense sunlight burns down on them as well, and reflects off surrounding rock. Despite all these challenges, juniper trees can grow to be very old! Their average lifespan is 400-750 years, and some get even older. For a plant to live such a long time, it must be very strong and well adapted to its

environment.

Adaptations of Utah Juniper

In order to protect themselves from hot sun and drying wind, junipers have developed a waxy coating on their leaves and berries. This holds moisture in and keeps sunlight from scorching the leaves. (Juniper "berries" are grayish-blue and are actually fleshy cones.)

Juniper roots are also specialized to fit their environment. Junipers grow one root straight down. This is called a tap root. (A carrot is also a tap root-one that we eat.) The juniper's tap root can grow 40 feet straight down, and can push through crevices and rocks. This creates a strong anchor and allows the juniper to find water deep in the earth. The juniper also puts out lateral roots that grow just under the surface of the ground away from the tree. Lateral roots can grow up to 100 feet away from the tree. They also grab onto the soil, holding the tree in its place, and absorb shallow water from short rainfalls. These two different root systems provide insurance that should one system be damaged, the other will continue to grow.

The juniper also has the ability to shut down certain branches and route all nutrients to a few branches in order to keep growing. This is crucial in times of stress, such as drought, when there isn't enough water for the entire tree to survive.

The gnarled and twisting habit (the word "habit" used when talking about plants refers to their shape) of Utah Junipers gives an indication of their age. It is a result of wind pushing on them. The trunk continuously twists very, very slowly over time. Indeed, the tightly twisted trunks look ancient.

As difficult as these conditions sound, and as tough as junipers are, they do not live in these harsh environments by themselves. Many other plants and animals have found different ways to adapt as well. Shrubs, trees, flowers, and grasses, as well as birds and animals, live together in communities, supporting each other with food and shelter.

Valley Nuts

by Michael Stahl



If you have ever eaten an almond in your life, you may be aware that it is one of the heartiest nuts available. Almonds are some of the healthiest nuts a person can bite into, and fortunately, they are also among the cheaper nuts one can buy. There are a few things you may not know about almonds, though. For example, you may not realize that almonds are not really nuts at all! In fact, they come from the fruits of almond trees. Almonds are in the pits of those fruits, which actually makes them seeds. To get at them, the stone-like pit has to be broken open. What is inside those pits is what we usually call the almond nut. Another thing you might not know is where almonds come from. Chances are if you are eating (and enjoying!) an almond at this moment, it was grown in California, USA. Almonds were not always grown there, though, and the story of how those seeds were made possible is quite incredible.

When the Spanish first settled in California, they actually shipped almond trees there. For some time, the Spanish took care of those trees and grew almonds to be eaten. When these Spanish settlers left, though, the almond trees were not looked after. Then, in the mid-1800s, almond trees were brought to America again, but this time, to the Northeast. Local farmers knew that California would be a better place for the trees because it was warmer there throughout the year. At that time, California's population was growing fast because of the discovery of gold. So, the almond trees were moved again and planted in California's Central Valley where there were plenty of new settlers to watch over them.

The Central Valley runs in the middle of the very long state. It is a 450-mile stretch of flatland that has

become very important to the United States because of the many farms that now exist. Over 230 different types of crops are grown in that area, including tomatoes, grapes, cotton, apricots, and, of course, almonds. Six thousand different almond growers live in California's Central Valley alone. They provide about 70 percent of the world's almond supply.

In 1933, the United States began the Central Valley Project with the goal of directing water from sources in the northern parts of the state-where there was a lot of rainfall and flooding from time to time-to the Central Valley, which, in certain parts, was even considered a desert and didn't have enough water for agriculture. Water would be brought in from other states like Colorado, home to the lengthy Colorado River. A tremendous series of aqueducts, canals and pump plants were built. Manmade reservoirs as big as large lakes were constructed; new rivers were dug too. This project went on through six different decades. All of this water now helps to irrigate over 3 million acres of farmland.

So, even though a large portion of the state is warm, sunny and dry almost all year, the manmade water system of the Central Valley Project helped to make California one of the biggest providers of food to the country and the world. Next time you bite into an almond, think about all of the hard work and thoughtfulness that went into making that nut. And then, remember it's not a nut, but a seed.

Homo Sapiens

by Jesse Kohn



It was about four months after I graduated from college that I finally got a job working at the zoo. The pay wasn't bad: all the chicken nuggets I could stomach and my own room in the cage where they kept the human beings.

I've always been a little nervous starting anything new, but I remember that first day being particularly unnerving, waiting for the zoo to open. I asked Joseph, who had been there for years, if there was anything I could help set up. He told me just to relax, maybe go down the slide a few times.

"Nothing like the slide to clear your mind," he said.

Emily and Cindy were waiting in line to go down the slide.

"You look a little green," Emily said.

"First day," I replied.

"First day, huh?" said Cindy. "I remember my first day. I spent the whole day hiding in the laundry closet."

"Listen," said Emily. "There's nothing to be nervous about. We just do our thing, and the people come and watch and sometimes ask us to do a trick."

When I got to the top of the ladder, a blow horn resounded through the park announcing that the gates were opening. My heart did a somersault, and I slid down the slide.

Sure, the job had little to do with what I had studied in college, but after having spent four months looking for work, I was desperate. It wasn't so bad at the zoo, either. I liked our habitat. It reminded me a lot of home. The part of our habitat that faced the visitors was kind of like a backyard. Behind the backyard was the fake house where we each had our own little room; we could always go nap there when we got tired. There was a pond-sized bathtub we were encouraged to swim in, and there was always music playing in case we felt like dancing.

Rainy days were best because there weren't many visitors. The zookeepers had hired a wonderful bunch of human beings, and it was a pleasure getting to know them all. It turned out every single one of them had something special they could do-Joseph composed music, Emily wrote poetry, Cindy read Tarot

cards-but even more impressive than what they could do, was who they all were. Sometimes I wondered if the zookeepers-or even the wide-eyed and fascinated visitors-had any idea just how special we all were.

On sunny days, the visitors crammed around our cage and hollered and cooed at us. Our trainers entered every hour and had us perform tricks in exchange for chunks of cookie dough, which, of course, none of us could refuse. My tricks usually had to do with dancing. One of our trainers spotted me dancing one evening and realized quickly that I had formidable moves. Of course the visitors ate it up. Many nights I'd go to sleep with my toes painfully calloused from fancy footwork and my limbs aching from my shaking legs. Joseph did mostly magic tricks, and Emily rode her bicycle in circles.

Once I recited a poem I'd memorized in French, but by the time I'd reached the third stanza, no one was listening.

On the third Sunday of every month, our trainers would leash us up and take us for a leisurely walk about the park. Without the glass between us and them, the visitors were much more respectful. They even seemed a little frightened.

One time a little girl dropped her doll, and Cindy picked it up and handed it to her. Her father suddenly pulled her away from Cindy.

"Don't touch it, Amanda!" he shouted. "That's a wild animal!"

Cindy was so angry the trainer had to wrestle the girl's doll away from her.

But working in the zoo had its perks, too. And eventually I'd been there so long that many of visitors started to remember me.

"It's Jesse!" the children would shout. "Do the dance! Dance for us!" And they'd dance with me on the other side of the glass.

There was even an old woman who came now and then and asked me to recite French poetry to her.

One time I slipped out of the cage late at night and sneaked into the "Oceans of the World" exhibit. The lights were out, but glowing jellyfish illuminated the walkways. I followed those drifting pillows of light through tunnels of artificial coral, past walls of water flashing with silver schools of tuna, and the circular tank with the circling sharks. Finally, I found what I was looking for: an immense cylindrical tank in the very center of the exhibit. In the dark, I could just barely read the plaque: *ARCHITEUTHIS, Giant Squid*. It was murky in the tank, and I stared at that black abyss for a long time, seeing only my own reflection trying to peer in through the glass. And I started thinking about who I was and about the other human beings, and I thought about what we were all doing in that zoo. And then, all at once, I realized that I had been looking into the eye of the squid. And in a flash of twisting tentacles and a cloud of ink even darker than the water, it disappeared into the shadows.

"And who are you really?" I whispered, staring into the tank.

Se Ri Pak, Champion Golfer

by Caitlyn Meagher



Keith Allison (CC BY-SA 2.0)

Se Ri Pak in 2009

Se Ri Pak wasn't always a golfer. Growing up in South Korea, her sport of choice was track and field. But at age 14, her father recognized her talent and strength, and began to train her in golf, instead. Within several years, she became a successful pro-golfer.

Pak's dedication to golf separated her from most players. Her motto was practice, practice, practice. Every day, Pak ran up and down the 15 flights of stairs in her apartment building in South Korea. There was even a time she ran down the stairs backwards! One of the key components in golf is strong legs. Having strong legs gives golfers stability and power. Pak was determined to become the best golfer possible, and her training reflected those goals.

At the age of 19, Pak left her home in South Korea to pursue her dream of playing with the best golfers in the world. She came to the United States, where she was the only Korean player in the women's league. Her incredible first season inspired many other Korean people to play golf.

In 1998, Pak won four events. They include the LPGA Championship and the US Women's Open, two

of the largest golf tournaments in the world. She was the youngest woman to have ever won the US Women's Open. This tournament held a number of nail-biting moments for Pak. At one point, she hit the ball close to a water feature on the course. She had to stand knee-deep in water in order to putt the ball close to the hole. But she was able to make the shot! On top of that, Pak had to play 20 holes to break a tie with another player - two more holes than a typical game of golf. It was the longest tournament ever in professional women's golf, but she won it!

Since 1998, Se Ri Pak won 21 events. In 2003, she competed in a men's professional event on the Korean Tour. She finished tenth, becoming the first woman to qualify for a men's event since 1945. In 2007, she was inducted into the World Golf Hall of Fame. She was only 29 years old, making her the youngest player to ever be inducted.

Over the course of her record-breaking career, Se Ri Pak has become a national hero in her home country. There are even children's books written about her! And perhaps most importantly, she has inspired thousands of Korean people, especially Korean women, to begin playing golf. She says, "I've given them the confidence to come out here. I think of them as my sisters."

Olympic Legend, Jackie Joyner-Kersey

by Caitlyn Meagher



Jackie Joyner-Kersey at the 1988 US Olympic Trials

Jackie Joyner-Kersey was no regular track and field athlete. She had an extremely impressive athletic record! In fact, she was named the Greatest Female Athlete of the 20th Century by *Sports Illustrated for Women*. Born on March 3, 1962, Joyner-Kersey grew up to be one of the greatest track and field athletes of all time.

Joyner-Kersey's success story started early. As a teen, Joyner-Kersey won many track, basketball, and volleyball championships. She went to the University of California, Los Angeles, to pursue her athletic goals, and at age 19 began training for the Olympics.

She worked to be the best in the seven-part track and field event called the heptathlon. The heptathlon tests many skills that include running, throwing, and jumping. Athletes earn points for each event, and the player with the most combined points wins the heptathlon. One of Joyner-Kersey's specialties was the long jump. The long jump combines speed, strength, and skill. A long jump athlete runs up to a line called the foul line and then leaps as far as possible into a sand pit. The athlete who leaps the farthest wins, but the athlete must jump before running past the foul line.

Jackie Joyner-Kersey experienced many successes at the Olympics. At her first Olympic Games, in 1984, she won a silver medal in the heptathlon. She was just warming up, it seemed. At her second Olympic games, in 1988, Joyner-Kersey broke the world record in the heptathlon by earning 7,291 points. At the same Olympics, she became the first American woman to win a gold medal in the long jump. In 1992, she broke another record by winning two Olympic heptathlons in a row, and gained a bronze medal in the long jump. In 1996, at the Olympic games in Atlanta, Georgia, Joyner-Kersey took home yet another bronze medal in the long jump. This was the last Olympics she competed in.

Decades have passed since Jackie Joyner-Kersey set the world record in the heptathlon at her second Olympic Games. Many athletes have competed in heptathlons, but no other athlete has beaten her heptathlon record.

While Jackie Joyner-Kersey was training and competing in the Olympics, she also created her own foundation to encourage children to play sports and contribute to their own communities. Since her last Olympic games, she has continued in using her athletic fame to inspire and change her community. Joyner-Kersey has dedicated her life after competing in track and field to supporting important causes. She has helped provide resources for children to reach their academic and athletic goals. She also has helped provide resources to many families. One of these resources is internet access. More than four million Americans have gained internet access because of her help. Joyner-Kersey also goes around the United States to speak about the importance of children's education, racial equality, and women's rights.

The Serena Slam

by Caitlyn Meagher



Serena Williams's serve is considered one of the best in tennis.

You have probably heard the name Serena Williams, and you might know that she is a famous tennis player. But what is it that sets her apart? Plenty! She has been ranked Number 1 in the world many times. She has also won many Olympic gold medals and more important tournaments than you could count on all your fingers and toes. Many people consider her one of the most influential tennis players in the world.

Williams, who picked up a racket at the age of three, grew up playing tennis with her older sister Venus. Coached by both their mother and father, the Williams sisters were homeschooled. They both had a talent for the sport. Both sisters had incredible athletic ability and used this power on the court. Venus and Serena supported each other constantly, whether they were playing as partners or competing against each other.

In 1995, Serena began playing tennis professionally, a year after her sister did the same. A few years later, in the finals of the 1999 US Open, Serena beat the top player in women's tennis at the time. This was Serena's first Grand Slam title. What is a Grand Slam? In professional tennis, the Grand

Slam tournaments are the four big tournaments that take place in the same order each year: the Australian Open, the French Open, Wimbledon in England, and the US Open. Also known as the Majors, they are the most prestigious events in pro tennis. Serena's first Grand Slam win kicked off a long string of successes. From 1999 to 2018, Williams won a total of 23 Grand Slam singles titles on her own, plus numerous doubles tournaments with a tennis partner. From 2002 to 2003, she completed her first "Serena Slam," meaning that she won all four Grand Slams in a row. She held all four Grand Slam titles at the same time, but not within the same calendar year. Only a handful of tennis players have accomplished this achievement.

In addition to winning Grand Slam tournaments, she also has won gold at the Olympics. She has three Olympic gold medals for doubles tennis, tournaments she played with her sister as a partner. On top of those wins, she took home a gold medal for singles tennis at the 2012 Olympics in London.

So how did Serena Williams manage to pull off all those wins? She dominates the court with her strength and agility. Her serve is considered one of the best serves in women's tennis history. She serves with power and places the ball with accuracy, making it difficult for her competitors to hit the ball back to her. She often hits many aces during tennis matches. An ace occurs when a player serves the ball into the correct area of the opponent's court and the opponent is unable to touch the ball, let alone return it. At Wimbledon in 2012, Williams not only won the tournament, but she broke the tournament's record when she served 102 aces throughout her matches in the tournament!

Williams also uses her mental strength and resilience to win tennis matches. In numerous tournaments throughout her career, Williams has made incredible comebacks. In the 2012 US Open Final, she was trailing her opponent towards the end of the game. She was two points away from losing the whole match. But Williams did not give up. She managed to make a comeback and win, taking home the championship! Her comebacks in high-pressure tournaments illustrate her remarkable focus and determination.

Serena Williams continues to play professional tennis and also runs her own businesses. In 2015, she became the first Black female athlete to have a picture by herself on the cover of *Vogue*. She has also created her own charitable organization that provides educational opportunities for underprivileged youth around the world. Serena Williams reminds young people that they can accomplish their dreams through hard work and dedication.

The Dinka Dunker

by Caitlyn Meagher



Born and raised in Sudan, Manute Bol was passionate about helping people in his home country, even donating most of the money he earned from his time in the NBA.

You could say that Manute Bol was made for basketball. At about seven and a half feet tall, his head was only about two feet from the hoop, and he could easily rest his hands on the rim! People called him the "Dinka Dunker," a name that combines his Sudanese tribe and his ability to stand on his toes and dunk the ball into the 10-foot hoop. Before he gained fame for his basketball skills, though, Bol was just a regular kid from a village in Sudan.

Manute Bol grew up in a small village and tended to his family's cattle. He was a member of the Sudanese ethnic group the Dinka. Bol's father gave him the name Manute, which means "special blessing" in a Dinka dialect. The Dinka are among the tallest populations in the world.

At age 15, Bol began playing basketball. A US college coach discovered him when Bol was playing in Khartoum, the capital of Sudan. Bol came to the United States not knowing how to speak English, but he studied hard. Within three short years, he was drafted to play basketball for the Washington Bullets, in Washington, D.C. The team is now known as the Washington Wizards. After three seasons

with the Washington Bullets, he moved to the Golden State Warriors, then played for the Philadelphia 76ers, and eventually finished his career with the Golden State Warriors.

Maybe you are guessing that he really racked up the points on the courts. Actually, that wasn't the case—he was known instead for his defensive game. When he spread out his arms, his wingspan measured a whopping eight feet, six inches from fingertip to fingertip. His wingspan helped him block almost any shot that came his way. Bol used his tremendous height and quick reflexes to become a great defensive basketball player, and he is the only player in NBA history to have more blocked shots than points scored. But his skills also went beyond basketball. He became a political activist and created many programs that helped people in Sudan.

Bol always had a passion for helping his home country of Sudan. While he was playing basketball in the US, Sudan was experiencing its second civil war. Bol donated most of his NBA money to support Sudanese people who were suffering. When his NBA career ended in 1995, Bol created the Ring True Foundation. This foundation provides medicine, food, and housing to the Sudanese people. He returned home many times to campaign for peace in Sudan. He also raised money to build schools in southern Sudan. Manute Bol died in 2010, but his legacy of charity and generosity lives on.

The Swim of a Lifetime

by Caitlyn Meagher



Gage Skidmore (CC BY-SA 2.0)

Diana Nyad speaking at a conference in 2016

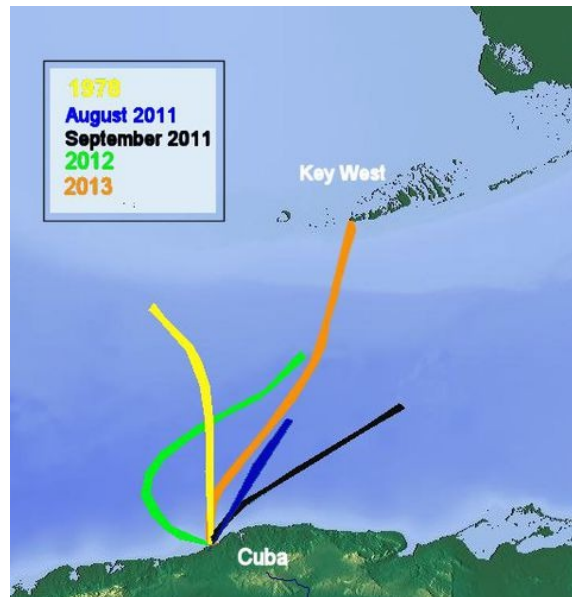
Diana Nyad liked to try the impossible. When she was in fifth grade, she decided she wanted to be a great athlete. She spent her young life in Florida waking up at 4:30 a.m. to swim for two hours. She would then run for an hour during lunchtime and swim again after school. Years later, she spent her days training to be a great marathon swimmer. Marathon swimmers swim long distances in open water. Water currents, wind, and waves are all obstacles that marathon swimmers deal with during long swims. When she reached her twenties, Nyad began completing long-distance swims that few people had attempted before her.

In 1975, Diana Nyad decided to swim around the island of Manhattan. After eight hours of non-stop swimming, she was pulled out of the water before she could achieve her goal. She had gotten a virus from the unclean water and had to recover for 10 days. But that didn't stop her. She tried again and made it around Manhattan in 7 hours and 57 minutes, breaking the record by nearly an hour.

This accomplishment was the first of many long-distance swims for Nyad. She made headlines by swimming from the Bahamian island of Bimini to Florida without a shark cage (an underwater cage that protects swimmers from sharks). She swam 102 miles in 27.5 hours, setting a world record. When she was 29 years old, she attempted to swim from Florida to Cuba, but was unable to make it, due to high waves that threw her against her shark cage. In 2010, after three decades away from marathon swimming, Diana Nyad began training again. She wanted to be the first person to swim from Cuba to Florida non-stop without a shark cage.

Swimming from Cuba to Florida required a lot of planning. This swim would take three or four days to complete. She would be swimming 110 miles. Nyad began brainstorming ways to make her swim

possible. She spoke with meteorologists about winds and currents. Even a slight change in winds could cause her to go off-course. She thought of ways to avoid shark attacks and jellyfish stings. She trained her body to get used to cold water for long periods of time. She swam 12 or 14 hours a day and eventually worked her way up to swimming 24 hours non-stop. Her first attempts to swim this route after 2010 failed, due to many different factors. In one instance, Nyad got stung multiple times by a box jellyfish, one of the most dangerous venomous marine creatures. Another time, Diana suffered an asthma attack that lasted for hours.



Froggerlaura (CC BY 3.0)

Diana Nyad's fifth attempt at swimming from Cuba to Florida was a success.

After the failed attempts over the years, Nyad began her fifth try in 2013. On the second night of the swim, there was a storm. Nyad had to stop swimming and tread water for two hours, making her very cold. She continued on, however. There was a strong ocean current that helped her along, so even with the rough seas, she made good time. Just before sunset on the third day, Diana Nyad reached Key West, Florida. She was 64 years old when she completed this swim. Exhausted and stumbling, Nyad managed to say to her fans on the shore, "You're never too old to chase your dream."

Jim Abbott on the Mound

by Caitlyn Meagher



Jim Abbott congratulating a child athlete with a disability on a good game

Jim Abbott used skill, dedication, and ingenuity to become a great baseball pitcher. He was born without a right hand, but this disability did not stop him from becoming a celebrated athlete and champion.

Abbott was born in Flint, Michigan, on September 19, 1967. From an early age, Abbott loved sports. All of the kids in his neighborhood played baseball, and he decided he wanted to join them. He just had to figure out a way to catch and throw a ball with only one hand. Abbott spent hours throwing a rubber ball at a wall and catching it with the same hand. Over time, he moved closer and closer to the wall, throwing and catching more and more quickly. This helped him develop incredible hand-eye coordination, a necessity for any great baseball pitcher. He also developed a technique to quickly put on his glove after pitching so that he could catch the ball. In a move later called the "Abbott Switch," he would balance the glove on his right wrist where his arm ended and rapidly switch the glove to his left hand. Still, some coaches did not believe in his talent. They did not think he could make it as a professional baseball player. He would soon prove them wrong.

While playing baseball at the University of Michigan, Abbott became more confident in his remarkable baseball abilities. He participated in the Pan American Games, a major summer sporting event where non-professional athletes compete. At the Games, Abbott pitched for Team USA. The team won silver, with Cuba winning the championship. Several weeks later, Abbott and Team USA played against Cuba again. This time they played in Cuba. Team USA beat Cuba, and Abbott became the first American pitcher in 25 years to beat the Cuban team in Cuba! He also ended up pitching for the US Olympic Team, and the team won first place in the tournament. After this Olympic victory, he decided to try to make it in the Major Leagues.

Jim Abbott joined the California Angels and became one of their pitchers. Many of his opponents would try and bunt the ball to him. Bunting a ball means hitting it softly without swinging at it, so the pitcher has to quickly throw the ball to the bases. His opponents thought he would not be fast enough to take his glove off and throw the ball with his one hand. He proved them wrong many times! His many years of practice paid off.

Abbott experienced many ups and downs during his Major League Baseball career. During some baseball seasons, Abbott lost almost as many games as he won. Like many athletes, Abbott experienced both big successes and big failures. But he continues to be an inspiration to many baseball fans and those with disabilities, even off the field. Since the end of his Major League career, Jim Abbott has devoted his time to working with children with disabilities, and he speaks throughout the United States about his experiences as an athlete with a disability.

At the Office

by W.M. Akers



"Wait here, sweetheart," said Albert's mother, "and I'll be done in a minute. Just hang out and have some fun." With that, she was gone.

There was a lot wrong with those two sentences. For one thing, Albert was too old for his mother to be calling him "sweetheart," especially in public. For another, he knew it would take a lot longer than a minute for his mom to take care of the work she had to finish that night. It would take more than fifteen minutes. It could take as long as sixty or seventy of them. But most importantly, there was simply no way he would have fun. Not for sixty minutes. Not alone in mom's office.

It was after six o'clock, and the whole building was empty, save for the security guard on the first floor. The floor where Mom worked was a long expanse of cubicles—tiny rooms with no ceilings, no doors, and walls made out of something that looked like carpet. It wasn't a stretch to say that Albert felt like a mouse in a maze. The difference was that a mouse gets cheese once it makes it way through the maze. Albert didn't have anything to look forward to but homework.

A few years earlier, he had relished these late-night trips to his mom's office. The empty cubicles were like tiny forts, with crevices he could squeeze himself into while he read or drew pictures. He could recline in people's chairs, pretend to talk on their phones, and leave silly notes on sticky paper for Mom's coworkers. The empty office was a sprawling gray kingdom, and he was the king.

But those days were long gone. Now, Albert looked at the cubicles and just saw cubicles. The chairs were just chairs; the phones were phones. And the empty hallways, lit by flickering fluorescent light, were far from being secret passages. If he was honest with himself—and this was a hard thing to admit—the quiet office made him a little bit scared.

It didn't help that he could hear a monster.

Again, this was something Albert was too old for. He knew there were no monsters in the office, just as there were no ghosts, zombies, or mad scientists. And yet-what else could be making that sound?

It came from far off. A deep-throated *whoosh*, mixed with an occasional grinding noise. He couldn't help picturing some kind of ogre, with a big, round body and stubby little legs and a mouth the size of his mom's compact car.

"And one eye," he said to himself.

Definitely just one eye.

It was probably standing guard in front of the elevator, clomping back and forth to make sure that Albert and his mom never escaped the office. They could take the stairs, sure, but the monster probably had friends in there-vampire bats with pointy little teeth, or gnomes who would hang upside down from the stairs and throw rocks at your head. And then they'd jump down on you and pull on your hair and-

"Little gnomes?" said Albert, interrupting his own train of thought. "Are you nuts?"

He needed to get a grip, and soon. The noise was getting closer.

He stood on the chair of the cubicle where he had been hiding. The cubicle walls stretched into the darkness. He climbed back down, not sure if he should hide, do some homework, or go searching for the noise. A rumble in his stomach made his decision for him. He couldn't sit still-he was hungry.

Sneaking one foot in front of the other, Albert crept down the line of cubicles, his heart in his throat. And just as he was nearing the corner at the end of the hallway-the corner that turned into the darkest part of the office-the *whoosh* stopped. Albert flattened himself against a filing cabinet. If there was a monster, it had gone silent.

He ducked under a desk, palms sweaty and heart racing. What had started as a sort of game had turned into real fear. He closed his eyes for what could have been a few seconds, or maybe ten minutes. He could hear his heart beating in his ears. He was too hungry to stay here all night. His stomach wouldn't let him. Finally, he peered out from under the desk. There was nothing there. Albert stood, his legs sore, and began walking again. And then he heard the sound coming from behind him.

"That's it!" he shouted. "This is unfair. You're sneaking around, and I don't like it. Just come and face me."

The sound stopped.

"Yeah! I know you're out there. Just step into the light and face me like a grown-up monster. I'm not scared."

He heard a little cough.

"Hello? Is there someone there?"

The monster was a woman.

"Yeah. My name is Albert. My mom works here!"

The monster stepped into the light: a middle-aged woman with a graying ponytail, wearing a sandy-colored uniform. "I work here, too," she said. "My name is Karen. Did you say something about a monster?"

"I was just goofing off."

"Maybe this was what you heard?" She reached into the shadows and pulled out a crazy-looking machine, with a long handle and big furry wheels. "It's a floor buffer. It polishes the floors."

"Oh. I figured that's what the sound was."

"Where's your mom?"

"In her office doing work."

"You bored?"

"Kinda."

"Hungry?" Albert nodded. Karen jerked her head, as if to say: "Come with me." So Albert did. They walked down the half-lit hallways, still creepy even though he was no longer alone, until they came to a big heavy door. Karen pulled out a huge ring of keys and unlocked the door. Inside was a kitchen. She took one key off her ring and handed it to him. "This'll unlock the cabinets," she said. "Eat up, kid."

Karen left, and Albert opened the cabinets. Inside were all kinds of snacks: peanut butter crackers, jelly beans, apples, and cereal. He gorged himself, making a feast out of the office food. It was still dark in the hallway, but he found that it was impossible to be frightened and full at the same time.

What's This? Seeing in all Directions

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



Photo Courtesy of D.Blackwood/USGS

Sea scallops may seem like they're in their own little world - but these shellfish are keeping a close eye on the world around them. Up to 100 eyes, that is! The scallop's mantle - the thin body part that sticks out of the shell - is ringed with up to 100 tiny eyes.

Like our eyes, each one has a retina and lens to detect and focus light. Scallops can see in all directions, helping them guard against predators and scout places for food and safety.

What's This? Speaking with Scent

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



Photo by Eframgoldberg (CC BY-SA 3.0 license)

Animals rely on their sense of smell for many reasons - to find food, avoid danger, and find their way. Some, like the **orchid bee**, use scents to communicate.

When male orchid bees sip nectar from flowers, they collect fragrant ingredients and store them in pockets in their back legs. This mixture becomes a custom "perfume" that the bee spreads to attract females in a mating display.

At the same time, the bee collects and spreads the flower's pollen. Specific species of orchids produce scents that attract specific orchid bees.

What's This? Sawfish

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

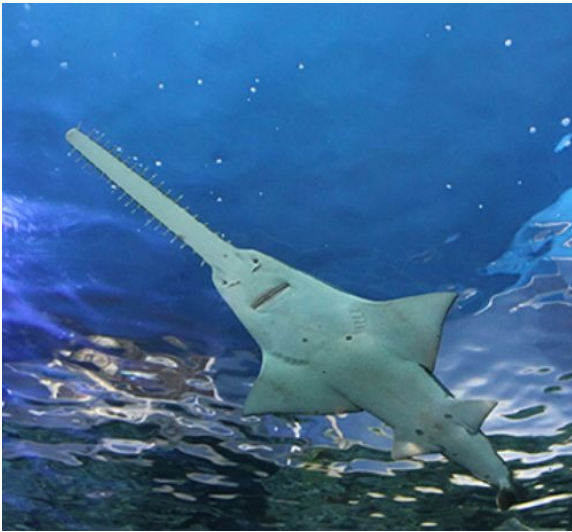


Photo by Holiday Point (CC BY-NC-SA 2.0 license)

This is the snout of a sawfish!

It's easy to see how this fish got its name: its long, flat, snout is rimmed with sharp points, like the end of a chain saw.

But this "blade" does more than cut - it also helps the **sawfish** track prey in murky waters. Its snout is covered with tiny sensors that detect electric fields produced by the fish's prey. As the sawfish swims, it waves its snout, scanning the water for shifts in electricity.

This ability, called electroreception, is found in a few other marine animals like electric eels and hammerhead sharks.



The body of a sawfish may look like a fish, but its long, flat snout sets it apart. Rimmed with razor-sharp points, this "saw" is a dangerous weapon for hunting prey and defending from predators. It can also be used to dig in sand looking for shellfish to eat. The sawfish's snout is covered with special sensory organs that detect electric signals produced by other animals. This ability, called electroreception, is like a "sixth sense" that helps the sawfish track prey, even in dark, muddy rivers and lagoons.

What's This? Seeing with Sound

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



Photo by Lip Kee (CC BY-SA 2.0 license)

During the day, **swiftlets** hunt insects in the forests and fields across Southeast Asia. But at night, they nest inside pitch-black caves.

How do they fly in complete darkness? Like bats, these birds have the ability to echolocate - to "see" with sound. To find their way in the dark, they make two clicks and listen for the echo. They can tell how far away something is by how long it takes the sound to bounce back.

Other animals that can echolocate include dolphins, toothed whales, and shrews.

What's This? Life in the Dark

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



Photo by J.McGuire/AmphibiaWeb/CalPhoos

If you've ever tried to find your way in complete darkness, then you know that without light, eyes are useless. And it makes no difference what color things are, since you can't see them. That's why most animals that spend their lives in the dark, like this **olm**, are blind.

This long, thin salamander swims in underground streams. It relies on other senses to find its way: it has a sharp sense of smell, keen hearing, and can even detect electricity from other animals. It can also sense pressure changes caused by other animals moving in the water. Food is scarce here, so olms are able to go without food for many years at a time.

What's This? Expert Ears

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



Photo by Mdf (CC BY-SA 3.0 license)

On a moonless night, an owl relies on its sharp hearing to track its prey. It can hear the faint rustling sounds of a mouse nibbling seeds or tunneling in the snow.

At first glance, you wouldn't think an owl has such excellent hearing; its ears are hidden under feathers on the sides of its head. In many species, like the boreal owl pictured, one ear sits higher than the other, so sounds arrive at each ear at a slightly different time and intensity. This helps the owl pinpoint where the sound is coming from, so it can hunt in complete darkness.

Jumping Bodies

by ReadWorks



This is the story of how I convinced my best friend I could jump bodies.

The first time it happened, I was sitting in Ms. Perry's sixth grade English class. We were reading a story about a man who had died but still believed he was alive. It was supposed to be a metaphor for something or other. Ms. Perry was going on and on about the differences between metaphors and similes and how to look for them in books, but I stopped paying attention the moment I heard her say, "The key to finding a metaphor is..."

It wasn't that I was incapable of focusing, but I had noticed a small crack in the window next to my desk. The crack ran the length of the window, and right in the center, it splintered into a giant spider's web of shattered glass. I was wondering how it had happened. We were on the fourth floor, and it seemed unlikely that any sixth or seventh grader could throw a rock that high and actually hit the window. After all, we weren't known for our athletic abilities at this school. I was thinking about all of the various possibilities -a bird, or maybe a freak accident-when suddenly I was staring at my classmates with my back against the chalkboard.

"I wonder if I left the stove on," I heard a small voice question from within my head. Then I saw a kitchen with a black and white tiled floor. I saw a hand reach out and switch the oven off. I didn't recognize the kitchen, and it certainly wasn't my hand. The fingernails were painted a dark cranberry color and the veins bulged out from underneath thin, brittle skin.

"Is everything alright, Ms. Perry?" I heard Charlotte ask. She was looking right at me. I felt cold and weak, like my knees might give.

Then, that was it. I was back in my body, sitting at my desk with a pencil in my hand. I was so surprised I almost fell out of my chair. Sammy, my best friend, nudged me. "Charles, you OK?" he whispered. "You look like you've seen a ghost."

"Yeah," I muttered. "I'm fine."

It didn't happen again for another two weeks. This time, I was in gym class. I was jogging around the track talking to Sammy. I didn't particularly want to be running. It was cold outside. A flock of seagulls was overhead, squawking loudly. I watched them soar above us. Flying was something I always wanted to do.

And then, suddenly, I was looking down at a bunch of red-uniformed bodies running in a circle. And I was immensely hungry. All I could think about was food, and getting more of it.

And then, just as suddenly, I was back in my own body.

"Sammy," I said excitedly. "What just happened the past five minutes?"

"What do you mean?" he asked.

"I mean, did I do anything differently? Did I seem normal?"

He paused for a moment. "You were just really quiet. I thought you didn't want to talk to me."

"Sammy," I said, "I just became a seagull."

He looked at me like I was crazy. "Quit it, Charles. I'm sick of hearing you lie."

I admit it: in elementary school I had been known to stretch the truth. I didn't consider it lying, *per se*, just extreme exaggeration. But this was the truth. I had just watched my classmates running around the track like hamsters on a wheel. And two weeks ago, I had stared at them out of Ms. Perry's eyes.

I placed my hands on his shoulders. "Sammy, I'm serious."

He looked at me skeptically. "Then show me," he said. "Turn into a bird."

"It doesn't work like that," I said. "I don't know how to control it. It just happens. When I'm bored. Or something. I don't know why it happens."

He snickered. "Sure, Charles. Whatever." He walked away. This wasn't going to be easy.

The next day, I got on the bus and plopped down next to Sammy.

"Turn into any birds lately?" he teased gently. Sammy was a sweet kid, the type of kid who stuck up for other kids and didn't even mind if it meant he was going to get bullied.

I stared out the window. I wasn't in the mood to explain it to him. There was another crack in this window and I wondered how it had happened. All of the windows around me seemed to be splintering.

And then, suddenly, I felt it. I knew it was coming. I was going to jump bodies again. This time I was prepared. I grabbed Sammy's hand. "Ready?" I said into his surprised face.

"What are you talking..." Sammy muttered. He didn't finish his sentence, because then we were driving the bus. I could feel Sammy in the bus driver's head with me. I could sense his panic.

I watched our hands—that is, the bus driver's hands—holding the wheel. This was incredible.

And that's when things began to get really weird. We were stuck.