A Bright Surprise

Lan had been charting the cycles of the moon for her science project. She drew sketches of the moon's different positions, and she took notes on its different patterns as it rotated around Earth. Astronomy was a new subject for Lan, and she found much in the sky that interested her.

Lan was looking forward to visiting her uncle that night. He lived far from the bright lights of the city, so Lan would get a clear view of the night sky. As Lan's mom drove, Lan watched the sun set. She was amazed by how bright the moon became as the sky darkened.

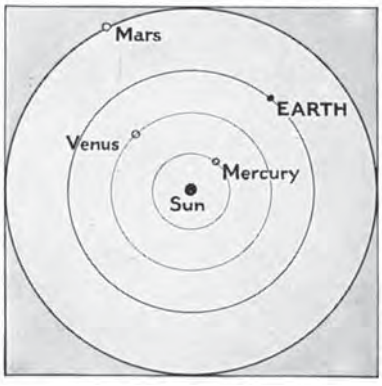
Uncle Jing greeted them with a hug. "You've come on a perfect night."

As Lan took out her sketching pads, her uncle stopped her and whispered, "Follow me!"

Lan followed her uncle up three flights of stairs. At the top Uncle Jing opened a door. There before her stood the biggest telescope she had ever seen.

"Tell me what you think about the moon now," he said with a smile.

Nicolas Copernicus



Today, we know that the sun is the center of the universe. But hundreds of years ago scientists believed that Earth was the center. It took an astronomer named Nicolas Copernicus to discover the truth.

Copernicus was born in Poland in 1473. At first, he studied law, mathematics, and medicine. Then he began to help an astronomer make and record observations of outer space. His interest in astronomy grew, but he did not have a job as an astronomer. Copernicus often had to work and make observations from his own house. These observations were based on the idea that the sun is the center of the universe.

Copernicus kept careful records of his observations. He used these records to introduce his theory to the world. He published everything in his book *On the Revolutions of the Heavenly Spheres*. But Copernicus was afraid people wouldn't react well to his new theory. He didn't publish his book until just before he died. Copernicus' theory transformed the way people studied astronomy!

Journey to a New Land

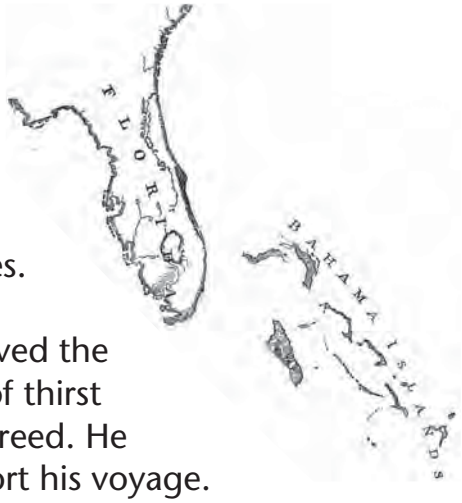
October 13, 1492

At first, I was hesitant to leave my wife and our young son, but Christopher Columbus convinced me to join him on the journey. He wanted to reach the Far East by sailing west. There we'd find great riches, such as spices, gold, and silk.

The journey across the sea was difficult. The swaying ship often made me feel sick. On days that we encountered rough, choppy waves due to storms, we were forced to eat food such as sea biscuits and pickled meat from the barrels below deck. On days when the sky was blue and the sun reflected off of the water, we fished and then cooked our catch.

After two months into the journey, the crew grew anxious. Just as we began to demand that we turn around and sail back to Europe, we saw tree branches floating in the water. We then knew that land was not far away. On October 12, 1942, we touched land. I felt much pride and relief. I now look forward to exploring this land.

A Mistaken Journey



Centuries ago, European countries traded with countries such as Japan, China, and India in the Far East. In the 1400s, land and water paths to get to these countries were often blocked. European traders had to find new routes.

Christopher Columbus decided to travel west across the Atlantic Ocean. Most Europeans believed the voyage would be too far, and sailors would die of thirst or starvation before reaching it. Columbus disagreed. He convinced the king and queen of Spain to support his voyage. On August 3, 1492, Columbus left with 90 men and three ships. The voyage was rough for the crew. The deck was crowded with cargo and always wet. Sailors were lucky to find a coil of rope to sleep on.

On October 12, 1492, instead of landing in the Far East, Columbus spotted the land now known as the Bahamas. On March 15, 1493, Columbus returned to Spain. He reported reaching Asia and a Chinese island. He told of wide rivers, magnificent hills and mountains, and rich, fertile land. But it wasn't the Far East.

Up Close with Polar Bears

Lucas thought polar bears were fascinating. He read that their paws were bigger than his head. The research he had been doing at the library for his science project warned him that they were large animals. Seeing them in person on this class trip to the zoo made them seem even bigger.

"Can you believe how huge they are?" Lucas asked his friend Cho.

"I knew they were big, but these guys are enormous!" Cho said.

"Polar bears are one of the largest animals in the world," their teacher said. "You researched polar bears, Lucas. What can you tell us about them?"

Lucas thought and replied, "I learned that polar bears need our help. Pollution is making the earth warmer, and the ice where they live is slowly melting. They need that ice to raise their cubs and hunt for food."

"You're right," said the teacher. "Here comes our guide. Let's hear what he has to tell us that might help you with your project."

Disappearing Polar Bears

Polar bears are one of the largest animals on Earth. Males can grow to be over 10 feet tall and weigh over 1,000 pounds! There is no wild animal that can hunt a polar bear. Yet, polar bears are in danger.

Polar bears live near the North Pole. Although they are big, they are great swimmers. They are also experts at walking on ice. Their large, webbed paws help them paddle when they swim and grip the ice when they walk.

Seals are the main diet of polar bears. They wait patiently on icy banks or on chunks of floating ice for a seal to emerge from the ocean for air.

The icy landscape that polar bears inhabit is slowly melting. The earth's temperature is getting warmer due to pollution. Without the ice, it is difficult for polar bears to hunt seals. Without seals, polar bears may starve.

Another threat to polar bears is businesses that are moving closer to their habitat to dig for oil. Oil spills sometimes occur, which make the bears sick.

Today, organizations are working hard to keep polar bears from extinction. More people are becoming aware of their plight.

Flying in Darkness

"We're finally here," I said to my sister. It was a smooth trip up from Mexico to our spring and summer home. We've already made ourselves cozy under the hard, cave-like structure. I heard the tourists that watch us at night call it a bridge. We bats call it home.

"The other night as we flew out at sundown to get dinner, I heard a tourist wanting to know how it is that we fly at night," I told my sister.

"What some humans don't know," she replied, "is that we use echolocation. Humans can't hear the small sounds that we make. They don't know that we listen for any echoes that return to us."

"That's right," I said. "Our two ears work together to detect how long it takes the echo to come back and how loud it is when it comes back. This tells us a lot about where we are and what surrounds us."

The sun has finally set for the evening. My sister and I send off small sounds. The echoes return and tell us that the tourists aren't far away. "This way," I call out. We zip past the humans and begin our nighttime search for food.

What Is Sound?

Most people and animals use the ability to hear every day. Sound is used in communication and to help navigate through the world. It plays an important role in our lives, but just what is sound?

Sound is made by vibrations that travel through the air like waves. Humans detect these waves through our ears and our sense of hearing.

Our ears consist of three main parts. The outer ear collects sound, the middle ear turns the sound into vibrations and waves that the inner ear can understand, and the inner ear transforms the waves into messages that are sent to the brain.

Not all sounds can be heard by humans. The human ear can hear a certain range of sounds. Sounds that are too high or too low cannot be detected. Other animals, such as dogs, can hear some sounds that we cannot. Sound can indicate where an animal's enemies are or where its next meal might be. People and animals can learn much about their surroundings through sound.

Medieval Tapestries

My seventh grade class arrived at the Metropolitan Museum of Art in New York City. Soon it would be time for me to give my presentation. Everyone had been given an exhibit to research. We would explain it to the class today. My exhibit was the tapestries from medieval Europe.

We finally got to my exhibit. My damp palms made my notes stick together. Everyone looked at the tapestries for a minute. Then I started my presentation. I explained that tapestries are heavy cloths woven using materials such as wool, silk, and silver. They were hung on castle walls to help keep the castles warm. They also provided decoration.

"They all have very different scenes," a classmate pointed out.

"These tapestries were also used to tell stories," I replied. "There's much that can be learned about European history by studying them."

Everyone seemed to be enjoying the tapestries. I felt proud when my teacher came over to congratulate me on my presentation.

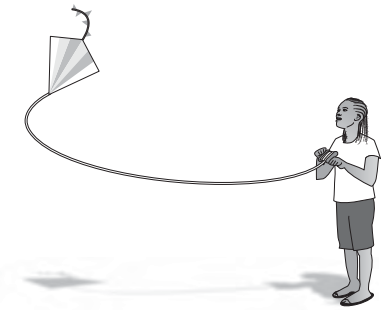
Woven History

A tapestry is a heavy cloth with designs or pictures woven into it. Tapestries were hung in castles during medieval times (400 C.E. to 1500 C.E.). They were hung for decoration and to help keep castles warm.

Making a tapestry was not easy. Much of the work had to be done by hand. Threads had to be stretched and weaved together, either horizontally or vertically. Many different materials, such as wool, silk, linen, and sometimes gold, were used. Weavers worked from behind the tapestry. They used a mirror to see their work. Some of the best tapestries look almost the same from both the front and back!

Similar to paintings, tapestries were a way to tell stories. They told about history, religion, mythology, or daily life. One famous tapestry is the Bayeux (by-YOO) Tapestry from England. It tells the story of an important battle of William the Conqueror. Today, historians study tapestries to learn about the past.

The Kite Competition



Jada was entering another kite-flying competition. She had been flying kites for years, so she was an expert at handling one. This competition was different, though. Only kites made by the kite fliers themselves could be entered.

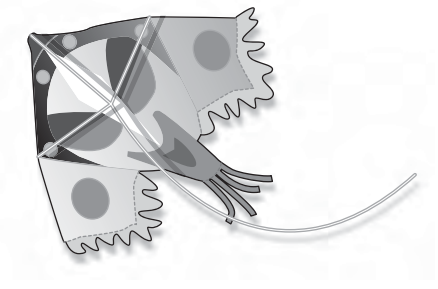
Jada spent all weekend thinking about designs for a kite. Her mother gave her several pieces of wood and cloth to use. Jada made and tested a few designs. She tried a box kite, but it was hard to handle. The diamond kite was a solid kite, but Jada wanted something different. She decided to build a kite that looked like a bat. She used wood for the frame and pulled a thin cloth tightly around the wood for the body. Then she painted finishing touches and carefully placed the kite on a table to let the paint dry.

"Your kite looks wonderful and sturdy," commented Jada's mother as they drove to the park on the day of the competition.

"Thanks for the materials," said Jada. "The time I spent planning, making, and testing different kites will pay off today," she said confidently.

QUESTION

Kites



People have been flying kites for thousands of years. The first kites were made in China with materials such as bamboo and silk. One story tells that the very first kite was flown by a man who tied a string to his hat to keep it from blowing away.

Traders who traveled to China brought the idea of flying kites back with them to other parts of Asia, Europe, and then America. At first, flying kites was considered recreational. Later, people learned just how important kites could be.

Kites have allowed people to make many advances in science. Benjamin Franklin flew a kite to learn more about electricity. The Wright Brothers used kites to help them develop the first airplane. Kites have also been flown to gather information about weather. Today, kites are still used as an inexpensive way to learn about weather. Thousands of years after their invention, kites continue to be used and enjoyed.

High Hopes

"Hello Mrs. Johnson!" Jackie Cochran greeted the older woman with a hug as she stepped out of the Model T. The two women walked into the New York City beauty parlor.

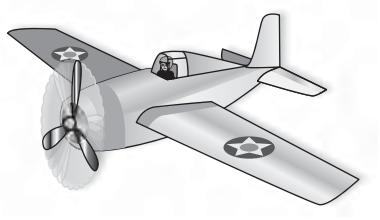
"I've got great news for you, Jackie," said Mrs. Johnson. "I'd finally like to get a permanent wave. Sure, it's been around for 10 years, but I just didn't have the nerve to try the new look earlier. I wish I had just one ounce of your spirit of adventure."

"Thanks for the compliment," replied Jackie. "I've got news for you, too. This may be the last haircut I give you." Jackie saw the shock in the older woman's eyes. "I've enrolled in flight school. My first lesson is in two weeks," continued Jackie.

"That sounds exciting, but what would a woman do with a pilot's license?" asked Mrs. Johnson, sensitively. "Will you fly in air shows?"

"Women have been flying for some time now and not just for show. Women pilots are breaking records, and they're also helping our country. I'm not sure which direction I'll take, but I'm determined to do something extraordinary!" said Jackie with a wink.

Women Airforce Service Pilots



Women Airforce Service Pilots, or WASPs, were women pilots in World War II. However, they were not thought to be part of the United States military.

During World War II, women were not given equal rights in the military. Men were the only pilots allowed to fly in battle. But pilots were still needed for other purposes, including flying planes from factories to military bases and flying supplies from base to base.

Women in WASP flew these non-combat missions. There were over a 1,000 women pilots. They completed months of training by the U.S. Army. These women, including Jacqueline (Jackie) Cochran and Nancy Harkness Love, became the first women to pilot American, military aircraft.

Thirty-eight WASP members lost their lives during World War II. However, WASP members were not considered part of the military. They did not receive military honors. Finally, in 1977, President Jimmy Carter signed a bill that honored all WASP members with full military status.

A Meeting at Home

Tyrell heard the rumors, but he didn't think they were true. At the start of every season it was the same story. People would tell about a team who was practicing baseball on this very field when out of nowhere, Jackie Robinson showed up. He hit fly balls to the outfielders, ground balls to the infielders, and let the pitchers try to strike him out without success.

"I don't believe it for a second!" Tyrell said to his friend, as they threw a baseball back and forth. Tyrell was a pitcher, and he was warming up his arm.

"I don't know," his friend said, shrugging his shoulders. "It could be true."

"He did so many important things after baseball. I doubt he had time for kids like us," Tyrell replied.

"Don't be so sure," a voice from behind him said. Tyrell spun around and in front of him was Jackie Robinson. He was standing at home plate holding a bat. Tyrell's jaw dropped. He couldn't believe his eyes.

"Practicing your pitching is important. Working for what you believe in is, too. Now, I hear you're a pitcher, and I'm standing here holding a bat. Let's play!"

Baseball and Equal Rights

Jackie Robinson was the first African American to join a major league baseball team, the Brooklyn Dodgers, in 1945. At a time when African Americans were not treated equally, he faced challenges and won many awards, such as Rookie of the Year, Most Valuable Player, and the World Series.

Robinson worked for equal rights after baseball. His goal was to help improve the lives of all African Americans. He worked with many important leaders and groups, including Martin Luther King, Jr. and the National Association for the Advancement of Colored People (NAACP). Robinson often sent letters to political leaders, such as Presidents Eisenhower, Kennedy, Nixon, and Johnson, about important equal rights issues.

Jackie Robinson made his mark in our country's history as a great baseball player and as a fighter for equal rights. After his death, Robinson's wife wanted his civil rights work to continue. She started the Jackie Robinson Foundation to help minority students pay for college.

Dinner with Friends

Mark was at his friend Sahil's house so they could study together for their math test. It was getting late, so Sahil asked Mark if he wanted to stay for dinner.

"I'd love to, but I'll have to check with my dad," Mark said.

"Great! My mom wants to know if you like your food really spicy, a little spicy, or not spicy at all," Sahil asked.

"I'm not sure. Probably not too spicy. What are we having?" Mark asked.

"Saag paneer. It's awesome. I could eat it every day. It's a dish with spinach, spices, onions, homemade cheese, rice, and bread."

Spinach wasn't Mark's favorite food, but he had to admit the smell of onions cooking in the kitchen was making him hungry. When they sat down for dinner, Mark looked at the food in front of him. It looked like nothing he had eaten before. Sahil enthusiastically took a big bite, so Mark closed his eyes and did the same. First, the spinach melted in his mouth. Then he tasted the sweet cheese. Finally, he bit into the tender rice. "Wow!" Mark said smiling, "This is delicious!"

Sweet, Sour, Bitter, and Salty

The weakest of our five senses is our sense of taste. However, don't be fooled by this fact. Our ability to taste is still powerful.

Taste is divided into four different categories—sweet, sour, bitter, and salty. Everything we taste is a combination of these four categories. A human tongue has numerous, tiny bumps on it. Within these bumps are about 10,000 taste buds. The taste buds have receptor cells which record what a person eats. New receptor cells grow about every 10 days.

The job of receptor cells is to send the information to the brain where it is interpreted. For example, if you taste a lemon, the receptor cells tell your brain that you are eating something sour. Your brain interprets this information and determines that the sour taste is that of a lemon.

When a person has a cold, he or she can't taste as well. That's because the sense of smell works closely with the ability to taste. The brain uses signals from both senses to enhance the ability to taste.