



Predicting

Level 4

A Collection of Readings

**Reading
Wings** 4th
Edition

The **Savvy
Reader**

This project was developed at the Success for All Foundation under the direction of Robert E. Slavin and Nancy A. Madden to utilize the power of cooperative learning, frequent assessment and feedback, and schoolwide collaboration proven in decades of research to increase student learning.

The Savvy Reader—Predicting, A Collection of Readings

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Prince Paul and the Pirates

Story by Darnell Parker

Illustration by Burgundy Beam





n most evenings, we could hear the waves lapping against the docks just below the village as we lay in bed. We could taste the salt from the water in the air. We could feel the moisture from the ocean mist. The days when the fishermen came back were the best. The whole village would run down to the piers to await their arrival. We'd watch the fishermen come back from their voyages. I loved the smell of the fish as the fishermen unpacked the holds of their vessels. I would sit on a rum cask and watch. The fishermen would sing sea chanties as they weighed their catches and swabbed the decks of the boats.

Waterford, and all who called it home, depended on the sea. The sea gave us our jobs, it brought us food, and it powered our machines. Everyone in Waterford respected and honored the power of the sea. My father, Richard Barton, owned and operated the stone mill in Waterford. As a young boy, I helped Father build the waterwheel, which pulled water from the sea, up the rocky cliffs, and into the mill. My best friend Jill's parents, Willard and Rebecca Killington, owned the fishmonger's shop. They bought the freshly caught fish from the fishermen and sold it to the villagers who lived and worked in Waterford.

The sea was our playground too. Everyone in Waterford learned to swim at a very young age. Joanna Dinsmoor, the swim instructor and lifeguard, had taught generations of Waterfordians to swim. On warm summer evenings, the entire village would come down to play in the water. Lady Dinsmoor would watch over all of us, her scrimshaw whistle hanging from her neck.

Those were good times. And as a young boy, I thought they might last forever. I was wrong.

One summer evening, after the workday was done, most of the village was down at the rocky shores. We, the children of the village, were playing in the surf. The grownups were there, too, sharing stories about the day. Lady Dinsmoor guarded us as ever with her keen, watchful eye. It was an evening like any other.

All of a sudden, the shrill sound of Lady Dinsmoor's whistle pierced the air. We'd been trained to get out of the water whenever we heard that whistle. Lady Dinsmoor would usually blow it when she spotted some dangerous sea creature, such as a shark or an orca. So when the whistle blew that night, we clambered out of the surf and onto the safety of the beach.

Lady Dinsmoor was standing on a dune, blowing her whistle and pointing out to sea. We followed her gaze. On the horizon, a few furlongs away, was a ship. I ran to my father. "Father," I asked, "what ship is that?"

My father looked out at the strange vessel. He scratched his chin and put his hand on my shoulder. "Jonathan," he said, "that is a pirate ship. And it cannot bring good fortune to our village. For wherever pirates are found, trouble follows."

I had heard stories of pirate ships. Legend told of pirates attacking poor villages. They would storm ashore in the dark of night and lay waste to the unsuspecting villages. They burned houses and tore down mills. They ransacked stores of food. They plundered the treasuries, stealing all of their gold. Then the pirates would depart, leaving wrack and ruin in their wake. That's what the stories said.

Frightened, I peered out at the sea. The ship was but a speck against the horizon. Most people in Waterford carried spyglasses with them wherever they went. Mine was with my jacket on the beach. I ran to find it and get a closer look at the pirate ship.

The ship was unlike any I'd ever seen. It was certainly unlike the fishing vessels docked at the village pier. It had black cannons pointing out from both sides of the vessel. Its masts had more sails than any other ship I'd seen, tall sails that seemed to reach the skies. But that was not all. Atop the tallest mast there flew a flag, the Jolly Roger, the standard sign of the pirate. The Jolly Roger was a black flag with a menacing skull in the center. Below the skull were crossbones, two bones in the shape of an X, bright white against the black of the flag.

"What shall we do, Father?" I asked. "I'm frightened."

My father looked down at me, his kind eyes peering out from under his wool cap. He scratched his thick, red beard in thought. "I'm not sure, Jonathan," he confessed. "The arrival of this pirate ship could indeed be bad news for our village."

I looked around at the people of Waterford. Families were huddled together. Most were watching the ghostly ship through their spyglasses. Lady Dinsmoor herself had ceased blowing her whistle. It hung around her neck from its leather strap. She, too, looked anxiously toward the sea. We all stood in silence, save for the sounds of sobbing among some of the younger boys and girls.

Suddenly, I heard the voice of Mr. Killington call across the sand. “People of Waterford,” he declared, “we must hasten to notify Prince Paul of the arrival of this ship.”

Murmurs from the huddled groups of people rose into the air. “Yes! We must tell Prince Paul! Prince Paul will know what to do. He shall save us.”

Mr. Killington sent his daughter Jill to run and tell the prince about the ship. As Jill clambered up the rocky hill to the village and toward the castle beyond, I breathed a sigh of relief. Indeed, Prince Paul would know what to do. He would save the day.

Prince Paul, Protector General of the Realm, was the ruler of Waterford and the surrounding villages. Prince Paul's father, King Philip, lived far away in the capital city of Valmora. Each of the king's sons and daughters ruled an area of the kingdom. As the king's eldest son, Prince Paul was responsible for the day-to-day affairs of Waterford and the other nearby villages. Prince Paul had the respect of all of Waterford, for he ruled with a fair hand. He collected taxes when he needed to, and he made sure that all of Waterford was cared for. He was kind, benevolent, and just. We trusted him with our lives.

On the beach, we awaited the prince's arrival. Soon the clarion call rang out, the trumpet blast that announced the prince was near. We turned our gaze from the sea toward the village.

First we saw Jill scamper down the hill. "He's coming! The prince is coming!" she called to us. Then the prince himself appeared. He was clad in the most beautiful purple and gold cloak. It was decorated with the Royal Lion, the sign of his father, King Philip. The young prince had beautiful dark curls that peeked out from under his royal crown. His boots were of the shiniest leather. At his side he carried his royal sword, sheathed in its intricate scabbard. Around his neck hung his own wooden and gold spyglass.

He stood at the top of the hill, his trumpet players and pages directly behind him. "People of Waterford," he called to us, his voice strong and bold, "I have heard of the pirate ship near our shores. I have come to learn more of this strange ship." Bringing his spyglass to his eye, he looked toward the distant vessel.

After a few moments, the prince strode down the hill to the shore. His pages and trumpet players followed. When they reached the shore, the prince again gazed through his spyglass at the ship. Then he closed his spyglass and cleared his throat.

He began to speak. “We have all heard the legends of pirate ships. So I can understand if you are frightened. However, we must not jump to any conclusions. I shall take a small crew of willing men and row out to the ship. We shall show this ship that we are a peaceful village that means no harm.”

Many in the crowd gasped, and others questioned the prince’s plan. However, the prince boldly continued. He said, “I need three willing volunteers to accompany me on this journey. I must warn you: I cannot guarantee the safety of those brave souls who shall join me. But you will earn the respect of your fellow villagers.”

There was silence in the crowd.

And then my father stepped forward.

“Father, no!” I cried, grabbing his hand.

My father turned to me. He knelt down and put his hands on my shoulders. “Jonathan, Waterford is a peaceful town. We have no police. If we did, we could send them. But we cannot. And, Prince Paul is right. We must find out more about this ship.”

I choked back a sob and retreated behind my mother, whose eyes brimmed with tears. Father turned to the prince. He bowed courteously and said, “Your Highness, I humbly ask if I may join you on this journey.”

The prince addressed my father. “Mr. Barton, the millwright, it is with great honor that I accept your offer. Please prepare a rowboat, so we may make our way to the ship.”

My father kissed my mother and tousled my hair. Proudly he walked toward the pier and untied our family’s boat. He began to attach the oars. The prince spoke to the crowd again. “Shall any other brave men join Mr. Barton and me?”

I held my mother’s hand. Across the crowd, my friend Jill began to cry. I saw her father step forward and bow to the prince. The prince said, “Mr. Killington, the fishmonger, it is with great honor that I accept your offer. Please assist Mr. Barton with the boat.” Mr. Killington kissed his wife and joined my father.

Then Mr. Harrison, the butcher, stepped forward. The prince accepted him as well and sent him to join the others at the rowboat. The prince had his three volunteers.

He turned once again to the crowd on the shore and spoke: “Mr. Killington, Mr. Barton, and Mr. Harrison have been brave enough to join me. I ask that you appreciate their offer and bid us a safe return from the pirate ship.”

The crowd wished the prince, my father, and the others a safe journey as heartily as they could. But in my mother's voice, I heard a slight edge of fear. I felt the same fear myself. Would my father be alright? Would the pirates hold him captive—or worse? Why had my father volunteered? These questions and many others ran through my mind as I watched the rowboat slip away from the dock into the open water and toward the ghostly ship.

“Good luck, Father,” I whispered as the rowboat grew smaller and smaller against the horizon.

“Indeed, good luck,” whispered my mother.

Through our spyglasses, we watched the tiny rowboat as it neared the pirate ship. I could hardly breathe. In the rowboat, my father and Mr. Killington were pulling at the oars, their strong muscles propelling the tiny boat through the choppy waves. In the back of the boat, Mr. Harrison waved a white flag he had taken from the village pier. He waved the flag as a sign to the pirates that the Waterford villagers were a peaceful group who meant no harm. Prince Paul stood proudly at the prow, his hand on his revolver in case any trouble arose. No one knew what awaited our brave fellow Waterfordians as they rowed closer and closer to the dark ship.

On the beach, I held tight to my mother's hand. "What shall we do now, Mother?" I asked, looking up at her. "Is there anything we can do to help Father?"

My mother looked upon me, her eyes wet with tears. "No, Jonathan, there is nothing we can do, save hope for the best and pray for a safe return."

As the rowboat neared the ship, a gasp went up from the crowd on the shore. The pirate ship was swiveling its cannons to face the tiny boat! My mother gripped my hand fiercely. Everyone knew that the rowboat could not withstand a blast from the mighty cannons of the pirate ship! Were the cannons to fire, it would spell certain doom for the brave souls in the boat.

Prince Paul must have seen the swiveling cannons, for he reached back and grabbed the white flag from Mr. Harrison. The prince waved it high above his head. I can little imagine what ideas must have been flowing through his head. I could tell that he was shouting something at the pirate ship. Perhaps he was yelling, "Stand down, sirs! Hold fast your cannons! We come in peace, and we mean you no harm!"



Whatever his words, they seemed to have had an effect, because the cannons did not fire. In fact, as I watched through my spyglass, I saw the pirates toss a rope to the rowboat. My father reached up, caught the rope, and tethered his boat to the mighty ship. Then the pirates dropped a rope ladder overboard. It seemed as though they were inviting Prince Paul, my father, and the others aboard! But why?

With the rowboat tethered to the bigger ship, I watched uneasily as the prince scaled the rope ladder up the side of the pirate ship and disappeared on board. My father, brave man, steadied the rowboat as Mr. Harrison and Mr. Killington also climbed the ladder. And then, with the other three already aboard, my father looked back at us, the crowd on the shore. He tugged the brim of his wool cap and raised his hand to us. In turn, I raised my hand to him, hoping that he'd seen me. And with that, my father scaled the ladder. Then he too disappeared over the side of the pirate ship.

The crowd on the shore watched for any sign of movement from the mighty ship, but there was none. The ship had grown still. Not a soul moved on its decks. I felt a strange mix of emotions. I was dreadfully afraid for my father's safety, yet I also held a great pride in my father. He had done something very brave. He had faced the unknown for the good of the village. I was proud to be his son.

My mother turned to me. She said, "Jonathan, there is nothing we can do now. We should go home and await news from your father and Prince Paul."

"Perhaps," I suggested, "we should see if Mrs. Killington and Jill would like to sit with us while we wait? For they are surely feeling our same fear as they long for news from Mr. Killington."

"Why, that's a wonderful idea, Jonathan," my mother said. "I'm sure I would enjoy the company as well." She told me to wait while she spoke with the Killingtons. Soon, she returned. It was decided: Mrs. Killington, Jill, my mother, and I would retire to our parlor and await further developments.

As we gathered our belongings, I whispered to my friend Jill, "Do you think our fathers shall be alright?"

Jill always looked on the bright side of things. She took my hand gently in hers. “Dear Jonathan,” she said kindly, “I do believe so. Your father is very brave and wise, as is mine. I have confidence in them. Also, let us not forget that His Highness the Prince is with them. The prince shall not let anything happen to our fathers. Come now, let us go to your home, for a slight rain is beginning to fall.”

It had grown cold since we had all been outside, and indeed I felt a few raindrops on my face. My mother and Mrs. Killington were waiting for us, talking to each other in hushed tones. I hoped that Mrs. Killington had made my mother feel better, just as Jill had done for me. Together, the four of us walked up the hill and through the cobblestone streets to our home.

When we arrived, my mother put on water to boil. “Children, would you like tea? Mrs. Killington, might I offer you some as well?” We all said yes. When the drinks were served, we sat and listened to the rain. The drops were falling harder now. We were glad to be dry inside. Yet we all thought about the men aboard the pirate ship. We knew we could only wait.

As we sipped our tea, our spirits warmed. Still, the time weighed heavily on us. Jill suggested that we play a parlor game to pass the time. “That’s a wonderful idea, Jill,” said Mrs. Killington. “Shall we play Old Maid?” We all agreed that would be a great idea. “Mrs. Barton,” Jill’s mother inquired, “have you any playing cards?”

“Why, yes,” my mother replied, and went to fetch the cards from our kitchen (for my father and I would often play cribbage at night at the kitchen table). We settled around the parlor table, the four of us, and my mother dealt the cards. She dealt seven cards to each of us, and we began the game. All of a sudden, there was a commotion in the street outside. My mother and Mrs. Killington leaped from the table and ran to the front door. Jill and I followed close behind. Out in the street, a young man was running through the rain. He shouted, “The men are returning! The men are returning!” I looked as the man drew closer. It was Wallace Harrison, the butcher’s son. “The men are returning! The rowboat draws near the shore!”

Without stopping even to put on our cloaks, we hustled out the door and down the cobblestone streets toward the hill and the rocky shore beyond. As we ran, the entire village seemed to gather in the streets. They hurried behind us to the shore.

As it had grown late, it was too dark to see much upon the sea. We could scarcely make out the ghostly silhouette of the pirate ship against the horizon, much less the tiny rowboat upon the waves. Still we peered into the blackness for any sign of the men.

“Wallace!” my mother said sharply. “How is it that you have come to know the men are returning? We can see nothing in this darkness.”

Wallace Harrison took off his hat and bowed to my mother. He cleared his throat and said, “Mrs. Barton, as you know, my father went in that rowboat with your husband and the prince. I have been sitting on the shore ever since their departure, even though you returned to your home. Only a few minutes ago, I saw a lamp burning against the sky. It grew closer and closer. Hark! There it is!” He pointed toward the darkness of the sea.

Indeed, a dim light bobbed and winked in the blackness: the rowboat returning from the ship! We ran to the dock to await its arrival. When the rowboat drew closer, a gasp went up from the crowd. For when it had departed, there were four men aboard. Now, there were only three.

Who had not returned? Was it the prince? Was it my father? Was it Mr.



Killington or Mr. Harrison?

I couldn't imagine what might have happened to the man who hadn't returned. Three shadowy shapes in the rowboat. Was my father among them?

The light from the lamp grew stronger. We heard the muffled sound of oars. At last, the faces of the men appeared.

Mr. Harrison and my father were rowing. Mr. Killington stood in the prow, holding the lamp.

But His Highness Prince Paul, our Protector General, was nowhere to be seen.

The three men tethered the boat to the pier. Each one approached his family. There were hugs and kisses all around. My father picked me up and swung me into the air. “Jonathan,” he cried, “it is wonderful to see you.”

“You, too, Father,” I declared. “We are so glad to have you back.” But it was impossible to celebrate, knowing the prince had not returned. Indeed, many in the crowd were murmuring. “Where’s the prince?” people asked. “Whatever has happened to Prince Paul? Where is His Highness? Where is our prince?”

My father turned to the crowd. He cleared his throat and began to speak. “Fellow Waterfordians, hear me! I have wonderful news about the pirate ship and our respected prince. However, let us all go in from the rain so I may share the tale. Let us all meet at Town Hall in five minutes, and I will tell you all about it. But worry not, for the prince is fine.”

“Yes, let us get out of the rain,” said Mr. Killington.

The crowd agreed, and we all walked up the hill to Town Hall, where the people of Waterford often met to discuss local business. It was a grand open building just down the street from Prince Paul’s castle. When the crowd arrived at Town Hall, we all filed in and found seats as best we could. Many people shook the rain out of their jackets and wondered aloud about the news.

My father took to the podium, the large stand at the head of the hall. Once everyone was seated, he held his hands up for quiet and began to speak.

“My fellow villagers, as I have said before, the prince is fine. The pirates have not taken him. In fact, there are no pirates in that ship.”

The crowd murmured, “What did he say? No pirates?! Tell us more, Mr. Barton! Tell us more.”

My father continued. “The ship just off our shores is manned by people from our own kingdom. The crew is from the Village of Avalon, not so very far from here. Let me explain.

“Weeks ago, the Avalon vessel was exploring the sea miles away. It was attacked by pirates—indeed, by pirates from the very same ship that I have just returned from. A great battle ensued. The vessel from Avalon was badly damaged, but its crew prevailed and won the battle. Then, with their own ship near to sinking, they overtook the pirate ship. They cast the pirates off in lifeboats.

“The crew from Avalon had a new ship—but alas, the pirate ship itself had been damaged. Thus the Avalonians knew they needed to find the nearest safe harbor. That turned out to be the village of Waterford. Being unsure whether they had found the right village, however, they aimed the cannons at our rowboat. They were not certain if we came in peace. Of course, once they recognized our prince they welcomed us immediately aboard. In short, all is well and the crew of the pirate ship is now having a joyous feast with our Prince Paul.”

A cheer went up from the crowd. My father held his hands up again for silence. “Tonight, Prince Paul will be staying with the crew from Avalon,” he said. “But tomorrow, we all have much work to do. We must work to rebuild the pirate ship, so that we may send the crew safely home to Avalon. I’m sure their families have been worried about them, just as you were worried about all of us. So please go home, sleep well, and meet here tomorrow morning when the cock crows.”

The next day was a joyous one, as the entire village came together to rebuild the pirate ship. Prince Paul oversaw the project. When he first came ashore that morning, the crowd roared in approval. “Hip hip hooray! Our prince is safe today!” cheered the crowd.

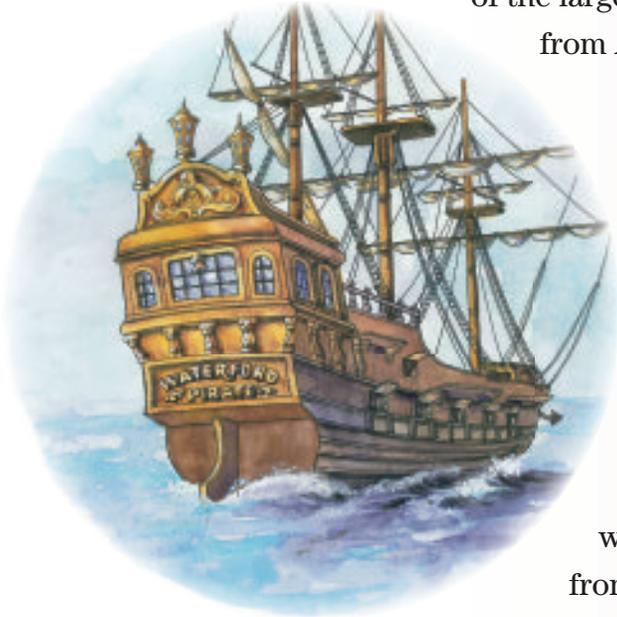
Men, women, and children all worked very hard. Lumber was cut to repair cannon blasts. New sails were sewn to replace the old ones. A tree from the nearby forest was felled to replace the shattered mast. After four days, the pirate ship was repaired. On the fourth night, Prince Paul declared that we were to have a feast in Town Hall, in honor of our friends from Avalon.

It was the grandest of all celebrations. We told stories of Waterford, and the crew from Avalon regaled us with tales from their village. Prince Paul and the Avalonian captain shared their own stories as they sat at the head of the largest table. At the end of the feast, the captain from Avalon stood up and called for silence.

“People of Waterford!” he boomed. “As a show of thanks for your kindness, and as the captain of my crew, I shall rename the pirate ship. From this day forth, let the old pirate ship be known as the *Waterford Pirate!*”

The crowd roared in approval. We were honored to have a ship named after our peaceful village. But more than that, we were pleased to have found new friends from the faraway village.

We danced and feasted into the night.



Outlaws & the Seas

Part 1. The Golden Age of Piracy

Part 2.

True or False:

Pirates Buried Their Treasure

Part 3.

The Most Fearsome Pirate
of All

Part 4.

Girls Could Be
Pirates Too



Outlaws of the Seas

Part 1.

The Golden Age of Piracy

Pirates are outlaws who rob ships at sea. There have been pirates the world over for thousands of years, but the Golden Age of Piracy only lasted about thirty years, from the late 1600s to the early 1700s. During that time, hundreds of pirates sailed the seas, attacking ships, stealing the cargo, and taking sailors and passengers prisoner. Pirates were especially active in the Caribbean Sea.



Many pirates sailed the Caribbean Sea and had hideouts on islands like Jamaica and the Bahamas.

Part 2.

True or False: Pirates Buried Their Treasure

Many of us learn about pirates from movies or television. But not all that we see is true. For example, pirates didn't really bury their treasure. They spent it all as soon as they got to shore!

Some stories are true though. Pirates did often pierce their ears and wear earrings. They believed it improved their eyesight!

Part 3. The Most Fearsome Pirate of All

The most feared and hated pirate of all time may have been William Teach. Known as "Blackbeard" because of the long black beard that covered much of his face, Teach was so



William Teach, known as "Blackbeard," was so fierce that even his crew was afraid of him!

frightening looking that most of his victims surrendered without a fight. Even his own crew feared him.

Blackbeard commanded a fleet of four pirate ships in the Caribbean. During his career, he captured more than forty ships and their cargo. To bury all that treasure, he would have needed a very big hole!

Part 4. Girls Could Be Pirates Too

When Anne Cormac of Charleston, South Carolina was sixteen years old, she fell in love with a sea captain named James Bonny. They married and moved to the Caribbean island of Nassau. It was there that Anne Bonny first encountered pirates. Longing for adventure and excitement, Anne disguised herself as a man and joined the crew of a pirate ship. It's said that she was such a good pirate that no one ever guessed she was a woman!



Did pirates really keep parrots? No, they were much too busy robbing ships to take care of pet birds!

Image courtesy of U.S. Fish & Wildlife Service

Sunken Treasures

Part 1. Watery Graveyards

Thousands of shipwrecked vessels have been found in North American waters: in the Pacific Ocean, the Gulf of Mexico, the Great Lakes, and in the so-called “Graveyard of the Atlantic” off the coast of North Carolina. These lost ships include historic warships, huge cargo and passenger vessels, and ordinary fishing boats. But they all have a story to tell. Some of them capsized in violent storms, some were sunk by enemy fire, some fell victim to human error, while some met an unknown fate.

Part 2. Lost and Found

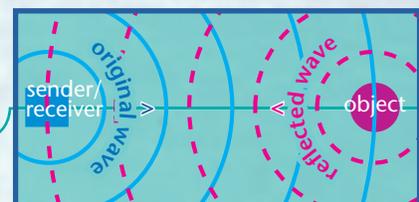
Some shipwrecks are found by accident, but most are found because underwater archaeologists go looking for them. Finding shipwrecks is not easy. There is nothing on the surface of the water to tell an underwater archaeologist where to look. So underwater archaeologists often begin by looking at historical documents, such as records of when a missing ship left port and where it was headed. Once the general location of the wreck is determined, archaeologists will scuba dive to search for it or try to locate it using sonar equipment.

Probably the most famous find was the wreck of the *RMS Titanic*, the passenger liner that hit an iceberg and sank during its first voyage from England to America in 1912. After years of searching, the remains of the *Titanic* were discovered off Nova Scotia in 1985.

Archaeologists recover and study objects from the past. Underwater archaeologists recover and study objects found in a body of water.



The “Graveyard of the Atlantic” lies off the coast of North Carolina.



Sonar equipment uses sound waves to locate objects under water. The sound waves bounce off the object and send a signal back to a screen on a boat. The signal shows where the object is, but not what it is. Divers have to find that out.

The Birth of Aviation

Part 1: The Toy That Changed History

One day in 1878, Bishop Milton Wright brought a toy helicopter home to his sons, Wilbur and Orville. It was not a helicopter as we know it today, just two wooden blades powered by a rubber-band. Nevertheless, the toy fascinated the boys: it showed them that something heavier than air could actually fly. The brothers began dreaming of inventing a machine that would allow man to fly.

Gliders depend on the wind to make them fly.

Part 2: The Wright Brothers Try, Try, and Eventually Fly!

The Wright brothers began by making gliders—heavier-than-air machines that could fly.

From 1900 to 1902, the brothers made and flew several gliders. But the gliders depended on the wind to keep them up in the air. The wind also determined the direction the glider would take and how long it stayed aloft. Wilbur and Orville were not satisfied. They wanted to power the glider with an engine so it did not depend on the wind.

In 1903, in Kitty Hawk, North Carolina, the Wright brothers' dream came true; they succeeded in building and flying the first engine-powered, heavier-than-air machine. Although it only stayed aloft for twelve seconds and traveled just 120 feet, the Wright brothers had invented the first true airplane.

Part 3: Relive the Birth of Aviation

Visit the Birth of Aviation exhibit and relive the Wright brothers' quest to build the first airplane. Learn about the brothers' inventive lives. Fly a toy like the rubber-band-powered one that inspired the brothers' dream; see exact replicas of their early flying machines; experience the thrill of flying a computer-simulated aircraft. It's not just an exhibit—it's an adventure!



The Wright brothers figured out how to put an engine on a glider to create the first airplane.

"First Flight" Photo (1903) attributed to Wilbur/Orville Wright, courtesy of Library of Congress

Outer Space Place

Learn about the amazing discoveries of the Hubble Space Telescope.

Part 1: Pictures from Space

The Hubble Space Telescope was launched in 1990 and ever since has been sending astronomers pictures of our galaxy and other far-off galaxies. From an orbit 375 miles above the earth, Hubble circles the earth about every ninety-seven minutes. Named for the American astronomer Edwin Hubble, it is the first telescope to operate from space.

Part 2: Exploring Planets Far, Far Away

Hubble has changed our understanding of the universe. It has taken pictures that prove the existence of black holes, recorded a comet colliding with Jupiter, and provided the best ever pictures of the fiery red planet Mars. But Hubble's most important discovery may be the existence of galaxies that are twice as old as our own. Astronomers believe that the existence of these older galaxies proves that the universe is still expanding.

Part 3: Need a repair? Call an astronaut!

Hubble was designed to be repaired by astronauts. Since 1990, three spacewalking astronauts have replaced worn out parts of the telescope. Each repair has made Hubble ten times more powerful than before.

Predicto predicts:

Part 1 will be about how the Hubble Space Telescope takes pictures of Earth from space.

Clues: The title, heading, illustration of Hubble in orbit and the caption, and the sidebar about astronomers

Part 2 will be about how Hubble has landed on different planets in the universe.

Clues: The heading (I don't think Hubble can explore planets without actually landing on them.)

Part 3 will be about how astronauts repair Hubble.

Clues: The heading



Roughly the size of a school bus, the Hubble Space Telescope orbits the earth about every ninety-seven minutes.

A black hole is an area of the universe where gravity is so strong that nothing, not even light, can be seen. Stars, and perhaps even planets, can disappear into black holes.

Astronomers are scientists who study celestial bodies such as planets, stars, comets, and asteroids. Astronomers use pictures from Hubble to learn more about the universe.



Images courtesy of Space Telescope Science Institute

USS Constellation

m u s e u m

Experience life aboard a 19th-century naval vessel.

PART 1. Welcome Aboard!

When you cross the gangway and step aboard the USS *Constellation*, you enter the unique world of a 19th-century naval vessel. Launched in 1854, the *Constellation* was the last all-sail wooden warship built by the United States Navy. The ship and her crew had many adventures at sea and took part in some of the most important events of the last two centuries, including the American Civil War and World War II. On board the *Constellation*, you'll find many things to see and do that will help you learn what life was like aboard this historic ship.

Starting at the Top

The *Constellation* has four levels, or **decks**. Step off the gangway and you're on the top, or **spar**, deck. Look up. The sails, three tall wooden masts with rope rigging, rise high above you. When the *Constellation* was built, engines didn't exist; the wind in her sails powered the ship across the sea. The captain plotted the ship's course on a nautical map, or **chart**. At the ship's wheel, or **helm**, an experienced sailor steered the *Constellation*. Using a compass, another sailor kept the ship on course. Take a turn at the wheel and imagine what it was like to steer this great ship across the sea.

Near the front of the ship, there is a bell that was rung to let sailors know when to report for work. Eight rings signaled the start of a new work shift, or **watch**. The sailors worked around the clock in four hour shifts—four hours of work followed by four hours of rest. Ring the bell, and imagine the sailors hurrying on deck to report for duty.

The *Constellation* was a warship, built for battle. To experience her fire power, go one deck below.

USS *Constellation* is the last all-sail warship built by the U.S. Navy. USS stands for United States ship.

Ready, Aim, Fire

Take the narrow ladder one flight down, and you'll find yourself on the **gun deck**. You'll see twenty guns, ten on each side of the ship.

It took fourteen men and one boy to fire each gun.

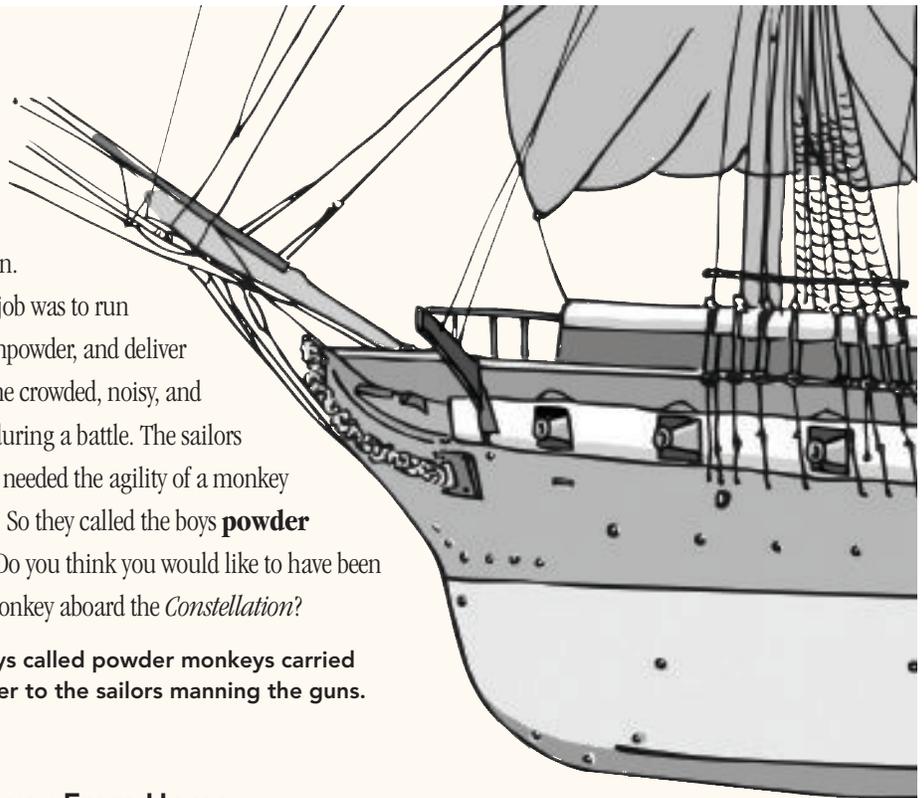
Some of the boys were as young as twelve. Their job was to run to the far end of the deck, pick up a supply of gunpowder, and deliver it to the gun crews. It became crowded, noisy, and smoky on this deck during a battle. The sailors

thought the boys needed the agility of a monkey

to do their job. So they called the boys **powder**

monkeys. Do you think you would like to have been a powder monkey aboard the *Constellation*?

Young boys called powder monkeys carried gunpowder to the sailors manning the guns.



Home Away From Home

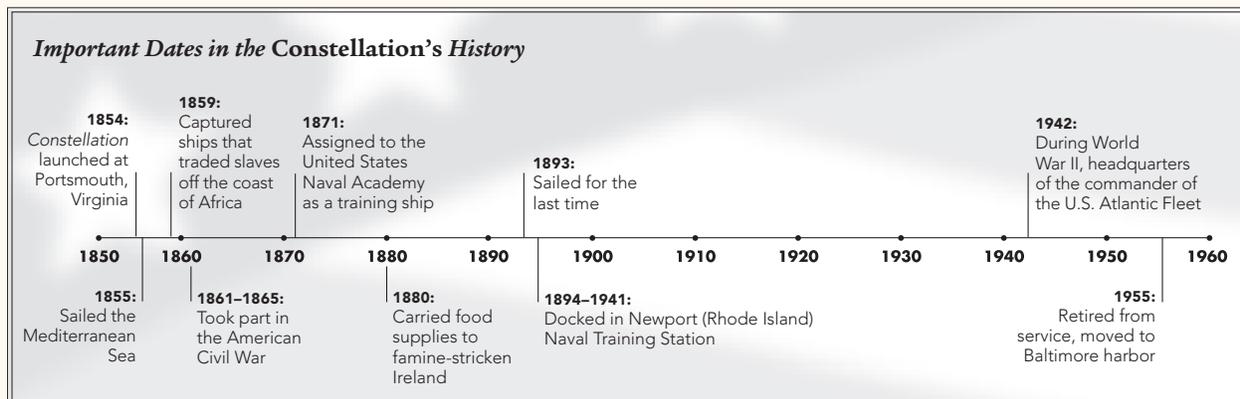
One deck below the gun deck is the **berth deck** where the sailors lived while on board.

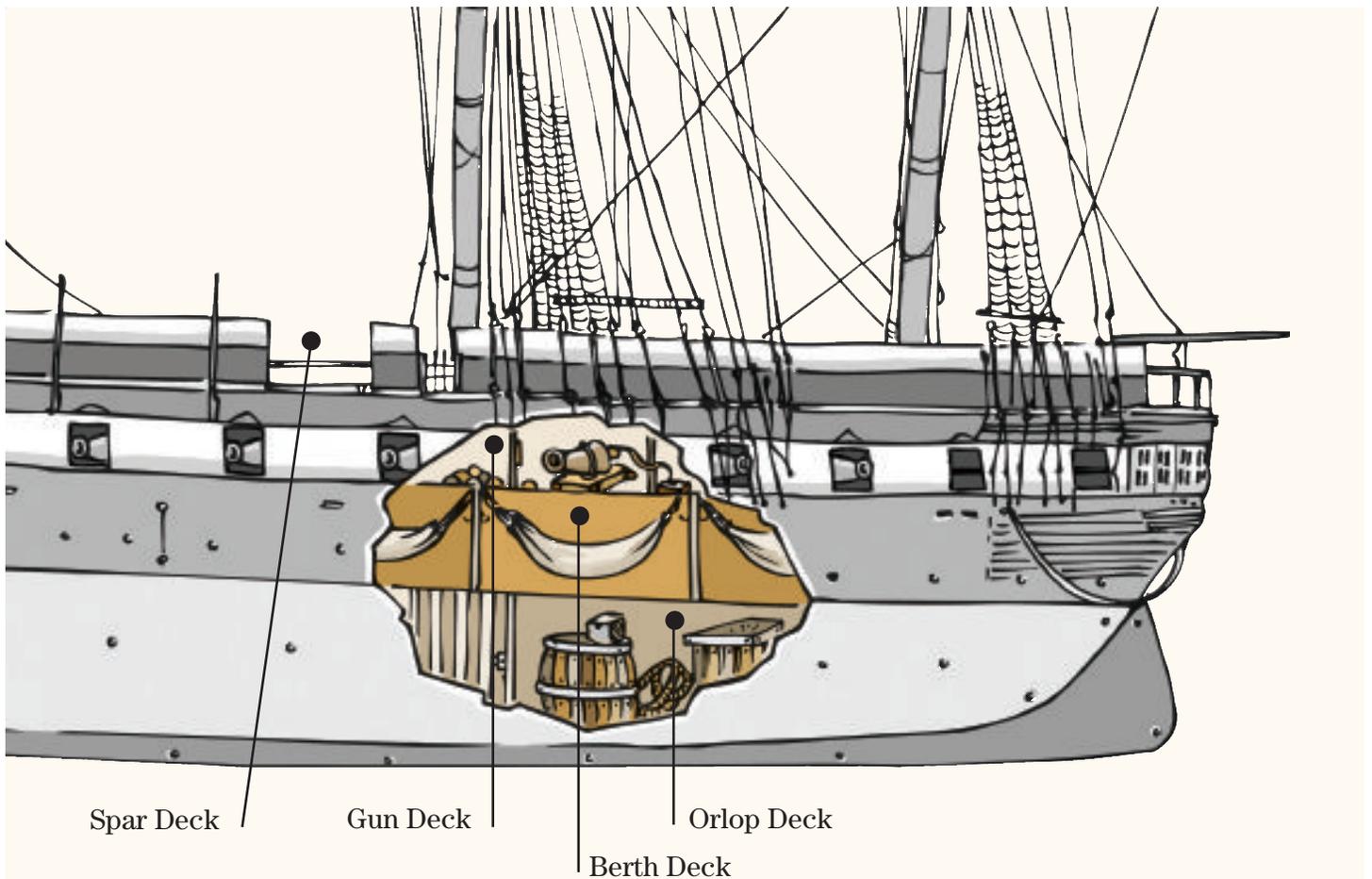
Between watches, about 150 off-duty sailors at a time ate, slept, and relaxed on this deck. Try out one of the sailor's canvas hammocks. Would you trade your bed for a hammock?

Down Below

On the bottom, or **orlop deck**, you'll find the hold, the place where the ship's supplies were kept. The *Constellation's* hold was stocked with everything the crew needed for a long voyage: food, water, and other supplies for the sailors, and the canvas, nails, lumber, and rope they needed to repair the ship.

The ship's jail, or **brig**, was also on this deck. Sailors who disobeyed orders or committed crimes while at sea, were locked up in the brig. Some claim the *Constellation's* brig is haunted! In 1863, a prisoner reported that he saw the ghosts of two dead sailors there. Maybe they liked life on board the *Constellation* so much that they never wanted to leave!





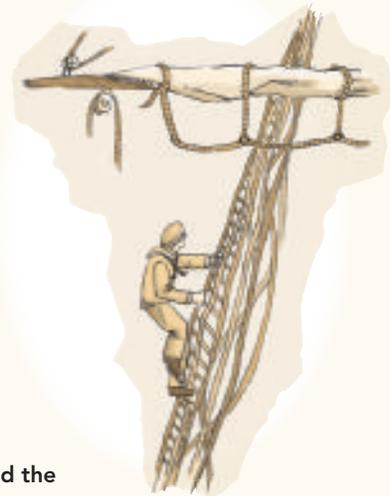
PART 2. Ahoy, Matey!

about 350 officers and sailors served aboard the *Constellation*. The captain was in charge, and he was assisted by several officers. The officers each supervised a group of sailors. A sailor's job included raising and lowering the sails, keeping the ship clean and in good repair, and firing the guns in battle. Imagine that you're a sailor on board the *Constellation*.

A Sailor's Day Begins

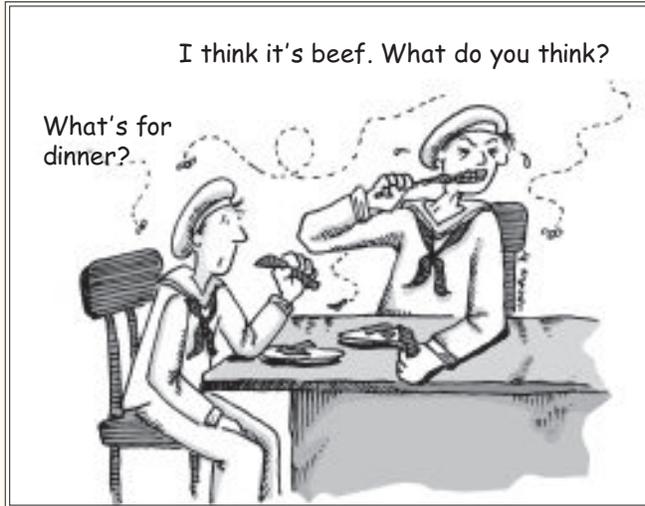
It's 7:00 a.m.: time to wake up and begin your day. You have seven minutes to climb out of your hammock, dress in your uniform, and line up with your fellow sailors on the top deck. At 7:07, an officer inspects you and your mates to make sure that you are neat, clean, and ready for duty. Then morning exercises begin. Jogging? Jumping jacks? No, sailors exercise by climbing the rope rigging to the top of the masts and back down again. And you'd better be quick! The last sailor to finish the climb has to do it all over again! At 8:00, the ship's bell sounds, and your watch begins. Your first job is to help haul up the ship's huge iron anchor. The *Constellation* is about to set sail!

For exercise, sailors climbed the rigging to the top of the mast.



Let's Eat!

It's hard work hauling the anchor, trimming the sails, keeping the ship cleaned and repaired, and keeping a lookout for enemy ships, so when your watch ends, you're going to be hungry. Head for the berth deck where the



sailors dine. The ship would have been stocked with fresh food while it was in port. But since there weren't any refrigerators on the *Constellation*, the fresh food would eventually run out or spoil. Until they could restock with fresh food, the crew made do with food that didn't require refrigeration, like dried meat, cheese, beans, and an oatmeal-like cereal called burgoo. But don't worry; there is plenty of salt and vinegar aboard to improve the taste!

At Ease

After eating, you might want to relax on the berth deck, write letters to your family, or swap stories with your shipmates.

While the 150 sailors shared one large living space, the captain and officers had private rooms. The captain even had his own kitchen and dining room, and the only bathtub on board. Go ahead, while no one's watching, look around the captain's cabin.

Then climb into your canvas hammock and get some sleep. In less than four hours, you'll be back on duty again.



Sailors were given canvas and rope and had to make their own hammocks.

Seasick

If the burgoo that you ate gives you a stomachache, don't worry. The *Constellation* has everything on board that the crew needs for a long voyage, even a doctor. The doctor's office, or sickbay, was stocked with medicine and medical and dental tools, like the pliers he used to pull out an aching tooth. Bet you're glad you just have an upset stomach!

◆ Maryland

SCIENCE

◆ Center

Discover for yourself how much fun science can be!

When Dinosaurs Ruled

Triassic Period

251 to 203 million years ago
dinosaurs appear.

Jurassic Period

203 to 146 million years ago
dinosaurs flourish.

Cretaceous Period

146 to 65 million years ago
at the end of which
dinosaurs disappear.

Humans first appeared about
200,000 years ago.



T-Rex: The meat-eating *Tyrannosaurus rex* roamed North America from 68 to 65 million years ago. How could another dinosaur escape a hungry T-rex? Run. Scientists think the T-rex was slow, reaching a top speed of about 20 miles per hour.



Giganotosaurus: *Giganotosaurus* lived about 100 million years ago in South America. The *Giganotosaurus* was a meat eater that walked upright on two legs. Scientists think that T-rex was smarter than *Giganotosaurus* because it had a larger brain. Now that's scary!

Highlights of just some of the things you'll see:

1. DINOSAURS: UNCOVER THE MYSTERY!

Although dinosaurs roamed the earth for nearly 200 million years, there were no humans around to tell their story so many mysteries about them remain unsolved. How did dinosaurs live? Why did they disappear? How many different kinds of dinosaurs were there? What was our planet like in the age of the dinosaurs? It has only been within the past 150 years that scientists, called paleontologists, have been studying dinosaurs and trying to solve the mysteries of these fascinating creatures.

Have you ever thought about becoming a paleontologist and studying dinosaurs? This exhibit will let you imagine what that would be like. Watch a video that shows paleontologists at work. Learn how to tell dinosaur fossils from ordinary rocks. Experience the excitement of discovery as you dig up dinosaur bones, measure them, and assemble the skeletons. Touch a 100-million-year-old dinosaur skull, bones, and teeth and see dinosaur eggs in their seven-foot-long nest. Examine dinosaur footprints, and predict the size of the creatures. You can even hear what a dinosaur might have sounded like!

And you'll see thirteen full-size dinosaur models, including a forty-foot-long

Tyrannosaurus rex,
a forty-five-foot-long
Giganotosaurus,
and the smaller
Astrodon johnstoni that
once lived
in Maryland.

DINO HUNTING

Dinosaurs roamed throughout North America, but the most likely places to find dinosaur fossils today are: Montana, Utah, Colorado, and the Connecticut Valley, where the first dinosaur footprints were found in 1902.

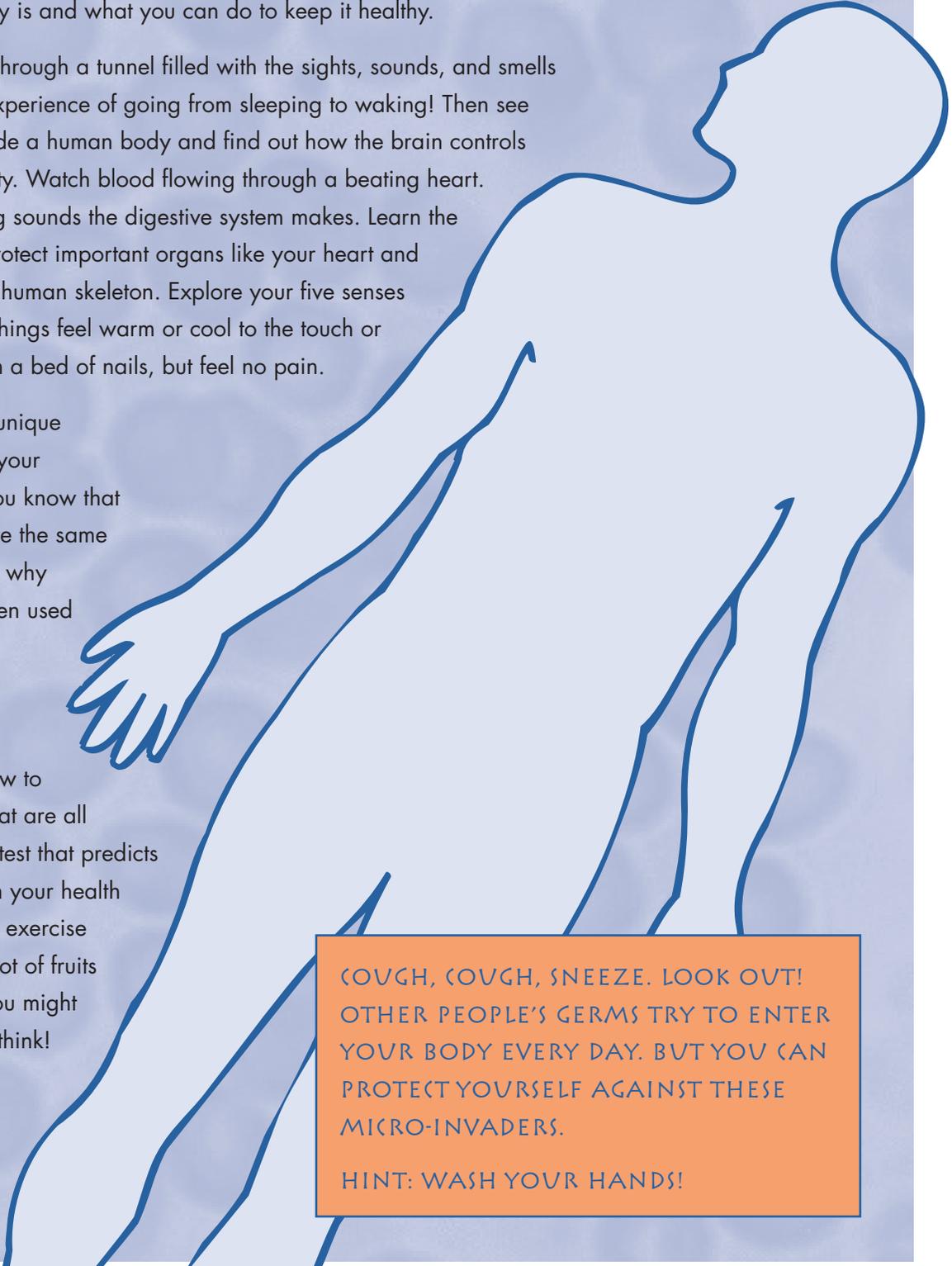
2. YOUR BODY: THE INSIDE STORY

Dinosaurs may have been bigger (okay, a **lot** bigger), but we humans are fascinating creatures too! Explore your own body and find out how everybody's body works. By taking a journey through a typical day and learning how different organs and bodily systems work, you'll find out how amazing your body is and what you can do to keep it healthy.

Begin by walking through a tunnel filled with the sights, sounds, and smells that recreate the experience of going from sleeping to waking! Then see a movie taken inside a human body and find out how the brain controls every bodily activity. Watch blood flowing through a beating heart. Hear the disgusting sounds the digestive system makes. Learn the way your bones protect important organs like your heart and lungs. Assemble a human skeleton. Explore your five senses as you learn why things feel warm or cool to the touch or why you can lie on a bed of nails, but feel no pain.

Discover just how unique you are by taking your fingerprints. Did you know that no two people have the same fingerprints? That's why fingerprints are often used to catch criminals.

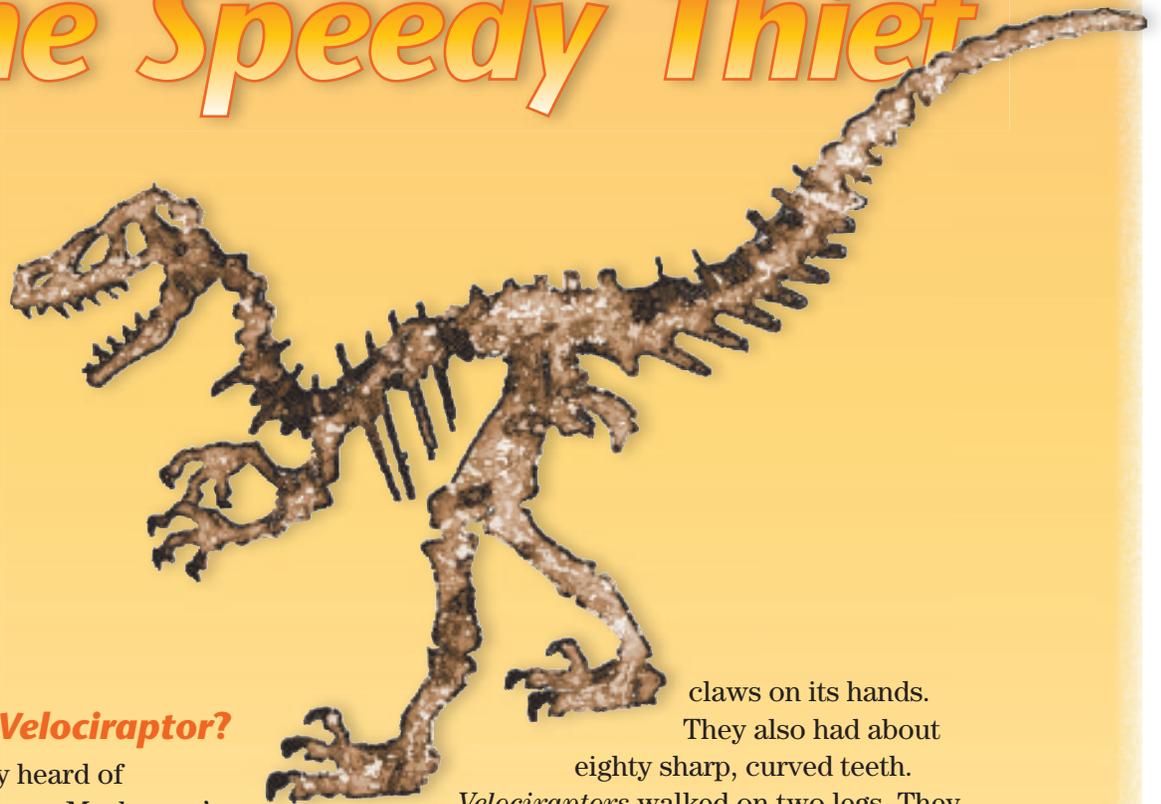
Learn how to keep your body in top shape. Find out how to avoid the germs that are all around us. Take a test that predicts your age based on your health habits. If you don't exercise regularly or eat a lot of fruits and vegetables, you might be older than you think!



COUGH, COUGH, SNEEZE. LOOK OUT! OTHER PEOPLE'S GERMS TRY TO ENTER YOUR BODY EVERY DAY. BUT YOU CAN PROTECT YOURSELF AGAINST THESE MICRO-INVADERS.

HINT: WASH YOUR HANDS!

The Speedy Thief



Part 1:

What is a *Velociraptor*?

You've probably heard of *Tyrannosaurus rex*. Maybe you've even heard of a *Brontosaurus* or a *Stegosaurus*. But have you ever heard of a *Velociraptor*? A *Velociraptor*, whose name means speedy thief, was a fierce dinosaur that lived during the Cretaceous period, about 85–80 million years ago.

Part 2:

Some Interesting Facts

Velociraptors were small in comparison to many other dinosaurs. They ranged from five to six feet long and were about three feet tall. Scientists estimate that *Velociraptors* weighed anywhere from fifteen to forty pounds. And they were carnivores, which means they ate meat. Due to their smaller size, *Velociraptors* had to be ruthless hunters.

Velociraptor had extremely sharp slashing claws on its hind feet, as well as sharp

claws on its hands. They also had about eighty sharp, curved teeth.

Velociraptors walked on two legs. They were very fast runners. Scientists estimate that they could have run as fast as forty miles per hour in short bursts. *Velociraptor* also had one unique characteristic—its neck. It had an s-shaped neck.

Velociraptors were very smart. They had very large brains. Their intelligence combined with their deadly claws, sharp teeth, and speed, made them fierce predators.

Part 3:

Velociraptors Found!

The first *Velociraptor* fossil was found in Mongolia in 1924. Since then, about twelve fossils have been found in Russia and China. One of the most interesting discoveries was a fossil of a *Velociraptor* who had died in a battle with another dinosaur. This fossil shows the true nature of the *Velociraptor*.

Comprehension Questions

Preview *Soccer Sense*, and answer question 1. Then read *Soccer Sense*, and answer the remaining questions.

Soccer Sense

Part 1:

History

Some historians date the origins of North American soccer all the way back to when settlers first saw Native Americans playing a form of the game, called *Pasuckquakkohwog*, which means they gathered to play football. But it was not until 1862 that the first organized American soccer club, the Oneidas, was created. A few years later, soccer was recognized as a college sport. In 1904, soccer became an official Olympic sport. In the years since, soccer has become a popular sport in the United States. Today both adults and children participate in organized soccer leagues.



Part 2:

Changing Rules of the Game

The official rules of soccer are established by the Fédération Internationale de Football Association (FIFA), which is the governing body of soccer. However, many rules are changed to fit younger players or special leagues. For example, younger players play on a smaller field. But some rules are standard for all players. The proper equipment, such as shin guards and soccer shoes, called cleats, must be worn by all soccer players. Also, there must be a referee on hand for each game, and tackling from behind is prohibited.



Part 3:

Profile

When you think of famous soccer players, David Beckham likely comes to mind. As early as age eleven, Beckham showed a natural talent for soccer. He honed his skills, and in 1991, he joined Manchester United, in England, as a trainee. His career was in full swing by the 1996/97 season, when he scored a goal from the halfway line, something even previous soccer greats had never done. Today, Beckham is still going strong. He recently moved from England to the United States where he plays for the Los Angeles Galaxy. He's also opened the David Beckham Academy in London and California. His academy helps train young soccer players around the world. Only time will tell what is next for this soccer legend.



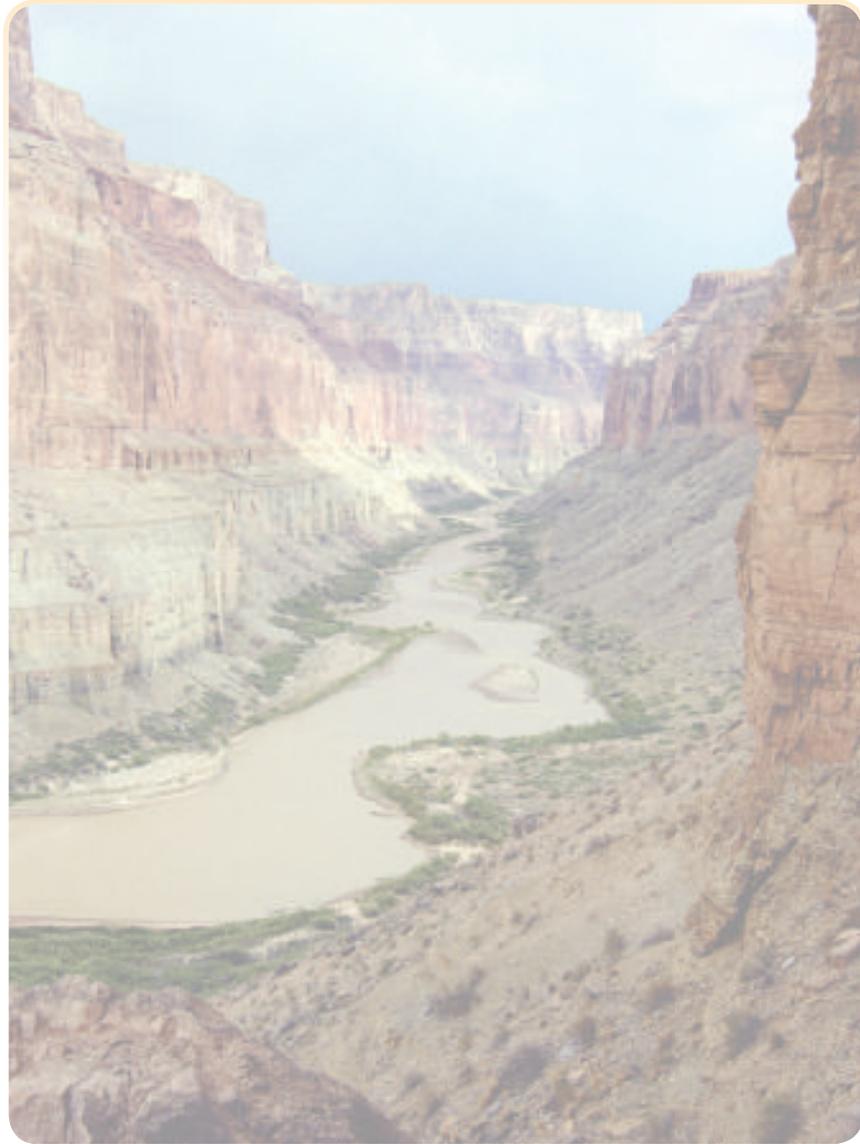
Go Deep!

Exploring the World's

CANYONS



By Tanya Jackson



Grand Canyon

Introduction: Go deep!

With your toe, you kick a loose rock off the rim. You listen as it bounces off the walls and tumbles down toward the rocks below. You'd like to see just how far it falls, but be careful! You don't want to fall off the edge. Luckily, there's a guardrail, so you can lean against that. But don't lean over it!

Now you shout "Hello!" into the air and listen carefully. Before you know it, you hear your voice again, in an echo. It's as if the canyon is shouting "Hello!" right back at you!

Canyons are some of the most fascinating places nature has to offer, and you can find them all over the world. There's the Olduvai Gorge in Tanzania, Africa, and the Vikos Gorge in Greece. In Idaho, you'll find the deepest canyon in North America, Hells Canyon. And who could forget the mighty Grand Canyon in Arizona? These are some of the world's deepest and most amazing canyons. But how are canyons formed? What makes canyons so interesting, fascinating, and even dangerous? Let's explore these natural wonders and learn all about them.



Did you know?
The word *canyon*
comes from the
Latin word *canna*,
meaning tube
or reed!

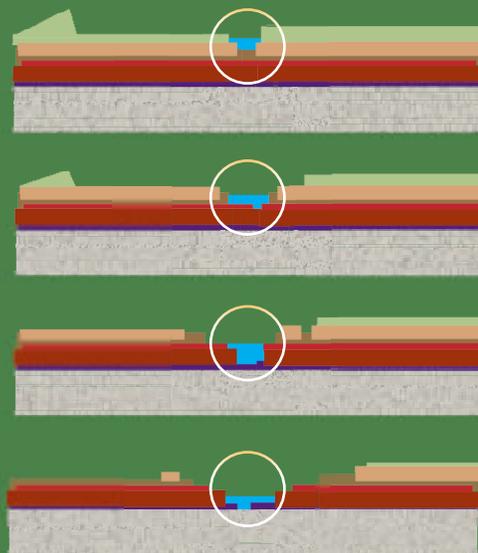
What are canyons, and how are they formed?

Canyons are long, deep chasms. They have tall, sloping, very steep sides. Canyons have rivers at the bottom. They are usually found in desert or mountain regions. It takes three elements to create a canyon: water, wind, and time. These three combine to create what is called *erosion*.



erosion (n):

The process of wearing away, steadily, over time. Both wind and water can cause erosion.





Water Erosion

Imagine a river running through a desert. Slowly, the force of the running water wears away the rocky bed and banks of the river. As a result, the river drops more and more deeply into the desert floor. This causes the banks of the river to become steeper and steeper. Eventually, a canyon forms. It takes millions and millions of years. Look at the Grand Canyon, for example. Some people believe the Grand Canyon was formed between 60 and 70 million years ago. The Colorado River still slowly and steadily cuts through the rock at the bottom of the canyon. So even though the canyon is millions of years old, erosion is still happening.

Wind Erosion

Wind erosion has a bigger effect on desert canyons than it does on canyons in mountain areas. In mountain canyons, trees often protect the rock and soil of the canyon walls. But in the dry and open desert canyons, the sandstone and rock are not protected. The wind whips across the unprotected rock, carving, shining, and polishing it. Over the years, wind slowly and steadily wears away the sandstone and rock just as water does. As the canyon gets deeper and deeper, it exposes more and more rock for the wind to erode. Wind erosion, like water erosion, takes a very long time to have any noticeable effect, but it is still an important part of the process. All the canyons we'll explore in the next section have undergone some mixture of wind and water erosion to become the deep chasms they are today.

Famous Canyons: Where in the world?

The Olduvai Gorge

There are canyons all over the world; let's start our journey.

Our first stop is the Serengeti (sare-en-GET-ee) Plain in Tanzania (TAN-zah-NEE-ya), which is in Africa. There we find one of the world's most famous canyons, the Olduvai Gorge. The Olduvai Gorge, a desert canyon, isn't deep for a canyon, at 295 feet. There are many deeper canyons throughout the world.

But the Olduvai Gorge is famous for a very important reason, an archaeological one. The Olduvai Gorge has helped many archaeologists unlock the mysteries of the past. There are several fossil beds in the Olduvai. A number of skeletons have come from these beds. Since the late 1950s, archaeologists have found skeletons of *Australopithecus*, *Homo habilis*, and *Homo ergaster*, three of the earliest ancestors of modern humankind. Researchers have even found footprints that are 3.75 million years old in the gorge, showing that humans lived and walked there long ago. Scientists continue to find skeletons in the fossil beds in the Olduvai Gorge that help them link the present to ancient times, so the Olduvai Gorge is indeed an important canyon.



archaeology (n):

The science and study of ancient history. For archaeologists, the Olduvai Gorge holds clues to the past.

The Vikos Gorge

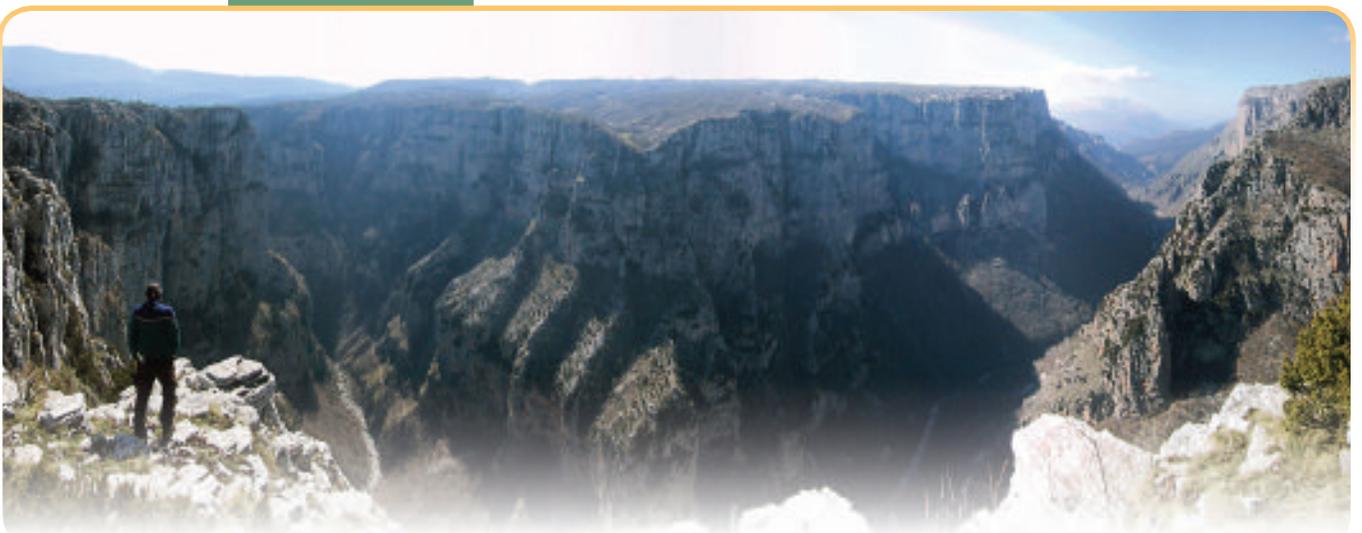
The next stop on our journey through canyons is in Greece. There you will find the Vikos Gorge in Vikos-Aoos National Park. This gorge has slowly been carved out by the Voidomatis River, which has been described as one of the cleanest rivers in Europe.

The Vikos Gorge is the deepest and longest canyon in Europe. In fact, a recent record book claimed that it was the deepest canyon outside North America. The Vikos Gorge (unlike the Olduvai Gorge) is a mountain canyon, so it's difficult to *gauge*, or figure out, its depth. The Vikos Gorge is located in the mountain region of northern Greece. Mountain canyons are usually surrounded by tall mountains and other high terrain, so it's difficult to tell where the rim of the canyon is.

The Vikos Gorge is one of Greece's best kept secrets. It is a popular hiking spot for people who take hiking vacations, without being a popular tourist destination. For this reason, the gorge is a quiet place to see much of Greece's wildlife uninterrupted.

terrain (n):

The features of a certain area of land. The Vikos Gorge is surrounded by mountains and other rocky terrain.



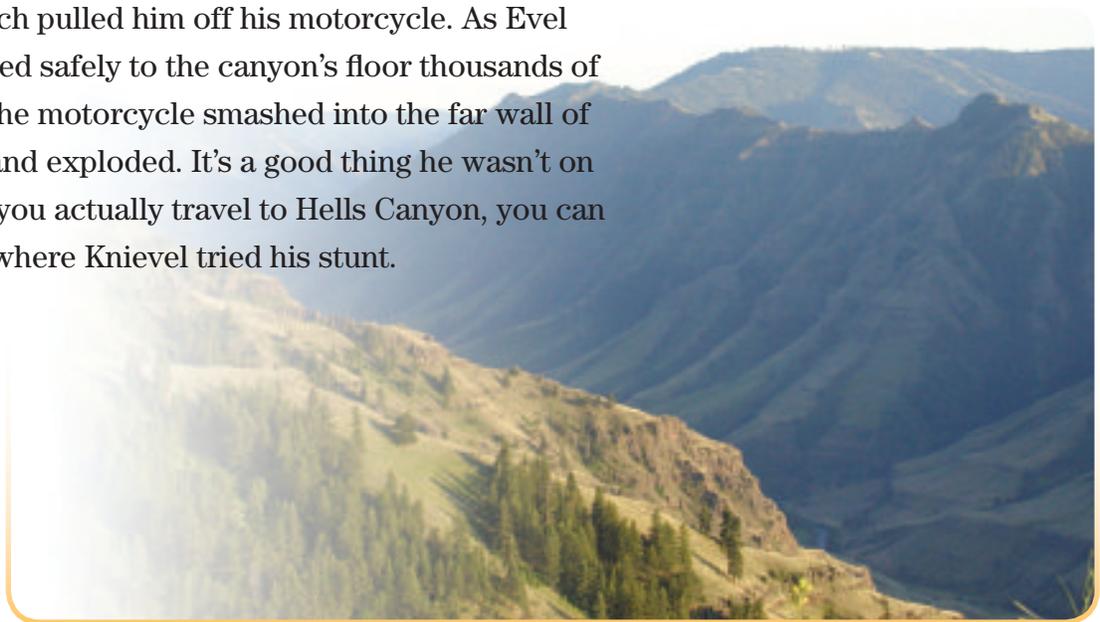
Hells Canyon

As we continue on our journey through some of the world's canyons, we return to the United States. Our next stop is the Snake River plain in Idaho, where we visit the deep Hells Canyon. Hells Canyon is one of the deepest canyons in the world. In fact, it is the deepest canyon in North America. Hells Canyon is so deep that the depths of the Olduvai and Vikos gorges can't compare. The Devil's Peak is the highest rim of the canyon. It's a whopping 8,000 feet above the Snake River!

Hells Canyon's depth has attracted thousands of visitors for years, and in 1975, Congress established the Hells Canyon Recreation Area. But Hells Canyon has another claim to fame, and that's because of a daredevil, or stuntman, named Robert "Evel" Knievel (KUH-nee-vul). In September of 1974, Evel Knievel attempted to jump his special rocket-powered motorcycle across Hells Canyon. His attempt failed. His parachute accidentally opened, which pulled him off his motorcycle. As Evel Knievel drifted safely to the canyon's floor thousands of feet below, the motorcycle smashed into the far wall of the canyon and exploded. It's a good thing he wasn't on that bike! If you actually travel to Hells Canyon, you can see the site where Knievel tried his stunt.

Did you know?

American Indians were the first people to settle in Hells Canyon. The Nez Perce and other tribes lived in and traveled through the canyon, leaving petroglyphs and pictographs on the walls.



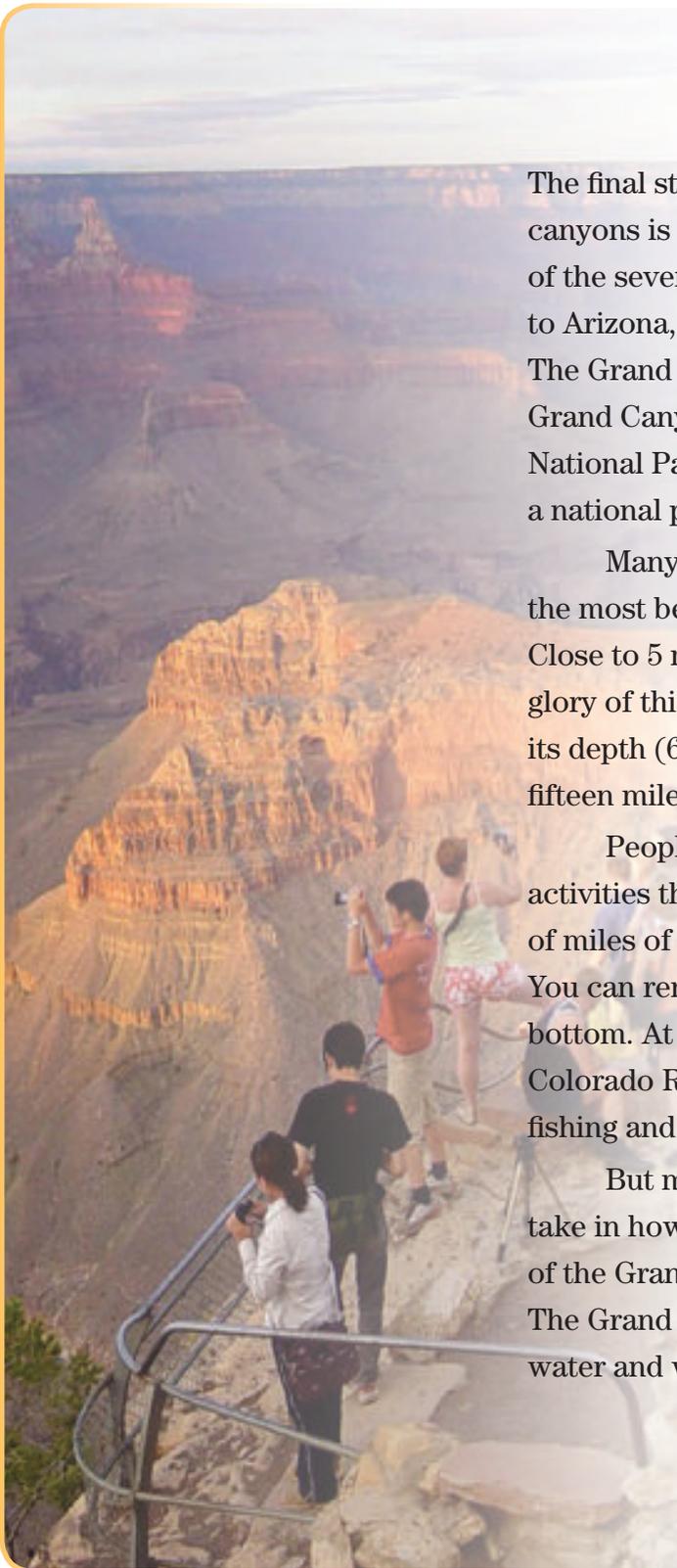
The Grand Canyon

The final stop on our journey through the world's canyons is the most spectacular canyon of all, one of the seven wonders of the natural world. We come to Arizona, where we find the mighty Grand Canyon. The Grand Canyon is a national park. In fact, the Grand Canyon national park was one of the first National Parks in the United States. It was designated a national park in 1919.

Many people agree that the Grand Canyon is the most beautiful and amazing place in the whole world. Close to 5 million visitors a year come to bask in the glory of this canyon. The canyon is amazing because of its depth (6,000 feet at some points), width (more than fifteen miles across at points), and length (227 miles).

People are drawn to the various recreational activities the Grand Canyon offers. There are hundreds of miles of hiking trails and many camping areas. You can rent mules to ride down the steep cliffs to the bottom. At the bottom of the canyon roars the mighty Colorado River, home to some of the world's best fishing and whitewater rafting.

But most people come to the Grand Canyon to take in how amazing it looks. Simply standing on the rim of the Grand Canyon teaches you to appreciate nature. The Grand Canyon shows you that, over millions of years, water and wind can create an amazing place.



Sound in Canyons: The Echo Effect

We briefly discussed the way a canyon can make your voice echo. Let's explore that idea some more. When you yell, your voice travels through the air in a series of waves. These waves continue to travel through the air until something breaks them apart. Dust, clouds, fog, trees... just about anything can do that. But in a canyon, especially a desert canyon like the Grand Canyon or the Olduvai Gorge, there are fewer obstructions to break up those sound waves. So the sound waves travel through the canyon until they hit the far canyon wall. When they hit the far wall, they bounce back to your ears! So what you're hearing is your own voice bouncing back to you; that's an echo! If you yell loudly enough, you might be able to make your voice bounce off more than one wall, so you might hear your voice echoing twice or maybe even three or four times! The echo effect is just one more reason people enjoy the experience of visiting a canyon.

Every canyon has a place where you can best hear your voice echo. At the Grand Canyon, it's called Echo Cliff!



Danger: Watch Your Step!

As breathtaking and amazing as canyons can be, they can also be very dangerous for those who aren't cautious. The two most dangerous elements of canyons are height and weather. Let's explore these two elements more closely.

Dangerous Heights

Gravity is the force that holds objects, people, and animals to the surface of the earth. You've probably heard the old saying, "What goes up must come down." This is especially important to remember when you're standing hundreds, or even thousands, of feet above the floor of a canyon. You certainly wouldn't want to fall in. Fortunately, at most of America's most popular canyons, the National Park Service has installed guardrails along the rims. These guardrails prevent people from getting too close to the edge.

Even then, you should be careful. Some people experience *vertigo* when standing so high up. This can make you feel faint and lightheaded. Make sure you step away from the canyon rim and guardrails if you feel lightheaded.

The heights aren't just dangerous for visitors at the top of a canyon. They're dangerous for people hiking in the canyon too. Why? Well, many people are tempted to throw or roll rocks into canyons. They want to see them fall and roll down the steep walls. The rocks can move pretty quickly. If a rock hits someone hiking far below, it can hurt him or her badly. So never roll or throw rocks into canyons.



vertigo (n):

A dizzy state that can be caused by extreme heights. Some people feel vertigo as they look out into a canyon.

Dangerous Weather

Many canyons, especially desert canyons in the spring and fall, have extreme weather. At the Grand Canyon, for example, it can be over 100 degrees Fahrenheit during the day and then drop well below freezing at night! These fluctuations, or changes, in temperature can be dangerous. People who aren't prepared might not carry enough water for the hot days or enough warm clothing for the cold nights. If you decide to go camping in or near a desert canyon, you should make sure you have plenty of both. Experts say a person needs at least three liters of water a day for hiking and camping in a desert canyon. Not having enough water can lead to *dehydration* (de-hi-DRAY-shun), which is sickness from not having enough water, or can lead to heat stroke, which is sickness from being in too much heat. If you're not prepared for the cold nights, you could experience frostbite or something called *hypothermia* (hi-po-THERM-ee-ya), which is having a body temperature that is dangerously low. These things can be dangerous or even fatal.

It doesn't matter why you come to a canyon. You might come to fish, hike, camp, or just see the sights. It's extremely important to be cautious and prepared. Caution and preparation help canyon visitors avoid the dangers we've learned about and enjoy the wonders of a canyon.

