

# The Flying V

This text is provided courtesy of the National Audubon Society.



Migrating geese fly in a flock shaped like the letter V. Why?

The big birds stir up lots of air with their heavy wings. If the flock flew in a straight line, each goose would be tossed around by rough air caused by the beating wings of the bird in front of it.

But air rises when it passes over the top of a bird's wing. Each goose takes advantage of this rising air. It flies behind and a little to one side of the bird just ahead.

A bird flying alone has to work hard and use a lot of energy to keep moving. But geese can get a lift from their neighbors flying with them, and that saves energy!

# Birds Don't Live in the Air!

This text is provided courtesy of the National Audubon Society.



Birds spend many hours on the wing, but they must come down at times. We can help make sure they find shelter when they land.

Some kids think migrating birds land only in faraway places, such as mountains or forests. But a man who lives in New York City saw more than 100 different kinds of birds in his tiny backyard.

Why would migrating birds choose to land in the center of a great city? They land there because they see trees and shrubs in backyards.

Ask your family and friends to keep your neighborhood green. Birds eat berries and nuts that grow on shrubs and trees and insects they find on the twigs and branches. Trees and bushes also make safe places for birds to hide as they rest.

# Wild Calls in the Springtime Sky

This text is provided courtesy of the National Audubon Society.



Imagine you are somewhere in the United States. It's an evening in spring. The air is still chilly. You watch a big red sun setting on the horizon.

*Ah-honk! Ah-honk! Ah-honk!*

The wide sky seems to be calling to you. There are dark specks in it, far away. The sound grows louder, the specks grow larger. They are wild creatures-birds-long necks outstretched, wings beating steadily up and down. One bird is in the lead, the others strung out behind in the shape of a large V.

Canada Geese are on their way north. These big birds fly through almost every state on the spring trip to their nesting places. Keep watch, and you are sure to see them.

These families of Canada Geese have lived together in the South during winter. One day in late winter, an adult male tosses his head up and down. There is a lot of gabbling and "talking" among the restless geese. Then they all rise into the air.

An older bird sets the course, but they change leaders often. The geese move slowly at first-high over cities, highways, rivers, and forests that spread out below them like a map. They push farther and farther north as the Earth warms, melting ice on ponds and lakes.

The geese fly day and night, landing briefly to rest or feed. As they come close to their summer homes, they increase their speed. Some flocks stop in the northern United States, others fly far into Canada.

The leader knows when they have arrived. The geese glide down, gabbling and honking at the sight of the marsh where they have built their nests in previous years.

When migrating geese pass over us in spring, they remind us that we share Planet Earth with wild creatures of many kinds-wild creatures on the move.

# Bird Migration: Low-Tech, Hi-Tech

This text is provided courtesy of the National Audubon Society.



Scientists are always trying to learn everything they can about when and how birds migrate. They still use some of the "old tricks," like counting birds through a telescope as they pass in front of the moon. These counts give them an idea of how many migrants are passing that night.

But scientists also depend on radar, those hi-tech instruments that are used at airports to track incoming planes. By watching the radar screen, scientists learn about the numbers and directions taken by migrating birds at night. Using the same kind of radar that helps police catch speeding drivers, scientists can even tell how fast the birds are flying.

Scientists put old and new methods to work to protect migrating birds.

# Nations Work Together to Help Migrating Birds

This text is provided courtesy of the National Audubon Society.



There is a certain long beach that becomes very busy every May. Hundreds of thousands of horseshoe crabs crawl out of the ocean. These fantastic creatures, with tails like spikes, are among the oldest kinds of animals on Earth.

Each female crab digs a hole in the sand. There she lays as many as 50,000 tiny eggs.

Overhead, the sky is filled with birds-plovers and sandpipers. Tired and hungry, they land on this important beach to feast on the eggs of the horseshoe crabs.

They stay for two or three weeks. Each bird must eat about 9,000 eggs a day to fatten up for the hard flight to its nesting ground far north in the Arctic.

Fortunately, enough eggs will be left to hatch and grow into adult horseshoe crabs! If there were no horseshoe crabs and no beaches, the migrating shorebirds would not find "fuel" to reach their nesting places. Beaches are part of a chain of life that stretches the length of the Western Hemisphere. Now Canada, the United States, and many other South American countries are working together to locate and protect beaches for birds, other creatures, and people, too!



# Talk About Migration

This text is provided courtesy of the National Audubon Society.



For thousands of years people watched birds arrive in spring, as if by magic, then disappear again in fall. They had no idea where birds spent the winter. Some people guessed that birds hid in the mud, like frogs, or flew to the moon!

Scientists began to follow the birds' movements. They learned where birds go in winter and what happens to them during migration.

Some birds migrate alone and others migrate in flocks. Some fly at night and land at daylight to rest or feed. Scientists discovered they often stop at familiar places each year: ducks may land on the same ponds, shorebirds on the same beaches, and songbirds in the same parks.

Now conservationists are trying to protect those resting places. When other people pave them over for roads or malls, birds are in trouble.

It's up to us to keep our eyes on migrants - the birds our ancestors believed had flown to the moon - and make sure they have safe places to rest on their long journeys.

# Magic Tomatoes

by Edward I. Maxwell



Luke's father is a farmer. To be more precise, his dad is a fruit-and-vegetable farmer. Instead of cows, pigs, sheep, and horses, Luke's house is surrounded by corn, squash, lettuce, and tomatoes.

Luke does not mind that there are no animals. In fact, he likes living on a fruit-and-vegetable farm much better. If you asked Luke, he would say that a fruit-and-vegetable farm is magical.

"What do you mean, magical?" Luke's friend Tom asked one day.

"Well, it's like this," said Luke. "My dad casts a spell, and soon enough the fruits and vegetables appear where there used to be bare dirt!"

Now, Luke knows that this is not really *magic*. But all the same, he feels it is pretty special that his dad is able to create something as grand as a corn field where there used to be nothing. Sometimes, Luke sets his alarm clock, so he can wake up before the sunrise, too. He eats cereal with his dad and asks him what spells he is going to cast.

"I'm planting tomatoes today, son," Luke's father explained. "Tomatoes ripen best in very hot summer heat, so I need to plant the seeds early in spring. That way there will be tall, healthy tomato vines once August



arrives."

"How do you make sure the vines grow tall and healthy?" Luke asked.

"They grow strong when you give them care and attention and have a little bit of hope," his father laughed.

"Can I help?" Luke begged.

"Of course!" exclaimed his father.

So on days Luke did not have school, he helped his father, and Luke learned more about his dad's magical work.

Luke learned that a tomato plant indeed needs a lot of care. He spent one whole day in the early June sun, sinking wooden stakes into the ground by young tomato sprouts. After the tomato vines had grown a little taller, Luke tied them to the stakes so that they would not topple over and lose their special fruit.

"The tomatoes sure need a lot of attention!" Luke exclaimed one late afternoon. He had been double and triple tying the vines, because the weather forecaster had predicted wind and rain for that night. Luke's father wanted to make sure his tomatoes did not get blown over in the storm.

"Most worthwhile things do require a lot of attention, Luke," replied his father with a smile.

"What do you mean?" asked Luke.

"Well," said his father, standing up straight and wiping the sweat from his forehead. "We should pay close attention to things that make our lives better."

"That is why you pay attention to Mom?" asked Luke.

"Yes," replied his father. "I pay close attention to you and Mom, because you both make my life better. You both make me very happy."

The rest of Luke's work that day went by a lot quicker. Taking care of the tomato plants, Luke imagined he was taking care of his mom and dad. With a little bit of family magic and a lot of attention, Luke was certain these would be the most beautiful tomatoes he had ever seen once August arrived.

# A Grand Old Canyon

by Linda Ruggieri



Canyons are deep valleys surrounded by rocky cliffs. One of the most famous canyons in the world is in the Arizona desert in the United States. It is called the Grand Canyon.

The Grand Canyon stretches for 277 miles. That is a long distance! If you were in a car traveling at highway speed, it would take you about five hours to go that far.

The cliffs of the Grand Canyon are made of brown, red, and yellow rocks and sand. It is one mile from the top of the cliffs to the floor of the canyon. The Colorado River flows along the canyon floor.

Nature has shaped the Grand Canyon. For millions of years, scientists say, wind and water hit the canyon's rocks and sand. Strong winds blew on the cliffs. Rain and river water wore down the rocks. Together, the wind and water created the canyon we see today.

Even today, wind and water continue to change the canyon by reshaping the rocks and battering the cliffs. The change is very slow, but it never stops. A million years from now, the Grand Canyon will look very different.

# Mexico's Natural Wonder: Paricutin Volcano



U.S. National Oceanic and Atmospheric Administration

*Paricutin Volcano erupting*

The Paricutin Volcano in Mexico earned its title as one of the seven natural wonders of the world in an explosive way.

In 1943, this volcano emerged from a cornfield in a village about 200 miles west of Mexico City. People living in the area had been feeling the ground shake and hearing it rumble for weeks. Then one day, the earth in the cornfield rose up about six feet! Ash and vapor exploded from the ground. By later that day, a small cone shape had formed. The volcano had begun erupting, sending lava and pieces of molten rock into the air. As these rock pieces landed around the new volcano, the cone shape grew bigger and bigger.

As Paricutin continued erupting, the surrounding area was covered in smoke and ash. People were forced to leave.

The eruption was most intense during the first year. By the end of the first year, the volcano was over 1000 feet high! Within two years, only the top of a church was visible above all the lava.

Paricutin continued exploding for about nine years before stopping. It is now about 1,391 feet high!

Now, Paricutin is considered extinct. But during the nine years it was active, scientists studied the volcano closely. Paricutin is the first volcano that scientists were able to study and document from birth to death. Thanks to this natural wonder, scientists learned a lot about volcanoes.

# Australia's Natural Wonder: The Great Barrier Reef



*The Great Barrier Reef*

In the Coral Sea in Australia, there is a reef. A reef is a ridge of rock, coral, or sand near the surface of a sea. But this reef isn't just any old reef. It's the Great Barrier Reef, the world's largest coral reef system. It covers over 2300 kilometers, reaching from shallow areas to deep ocean waters. It is so big that it can be seen from outer space!

The Great Barrier Reef is home to many types of living things. It has thousands of types of mollusks and over 1500 kinds of fish. It's also home to many species of sharks and dolphins, not to mention sea turtles, sea cows, and other creatures. Humpback whales even find their way to the reef to breed!

Although it's home to many creatures, the reef might be best known for its coral. The Great Barrier Reef has over 400 different kinds of coral. It includes both soft and hard coral. The reef's corals are many different colors, shape, and sizes. This is partly what makes the reef so beautiful.

The Great Barrier Reef is known as one of the most diverse and beautiful places in the world. But today, warmer ocean temperatures are putting great stress on the coral. Large areas of the reef have died or are in danger because of the warmer seawater. Pollution also affects the reef, as sediments or litter often find their way into the water. This is bad for the health of the reef and its plants and animals. People are working hard to protect the Great Barrier Reef and the species that live there. With people's help, there may be a way to save this beautiful reef and the living things it supports!

# Harbor of Rio de Janeiro

by ReadWorks



*Harbor of Rio de Janeiro*

On January 1, 1502, an explorer from Portugal named Goncalo Coelho and his crew sailed into a huge bay by what is now Brazil. A bay is a body of water that is partly surrounded by land. The explorers thought they had found the mouth of a large river. So they named the place "Rio de Janeiro," or "River of January." The bay they found is known today as the Harbor of Rio de Janeiro.

The Harbor of Rio de Janeiro is the world's largest natural bay, containing more water than any other bay in the world! Because of its size, the Harbor of Rio de Janeiro is considered one of the world's seven natural wonders.

The bay is surrounded by mountains made from granite. The mountains are huge and steep, with odd shapes. One of these mountains was named after a sugar loaf, because it looks like a type of bread made on an island near Portugal. Another one was named Corcovado, or "The Hunchback," because of its mound-like shape. Together, the water and mountains create a beautiful harbor.

The beauty of the harbor attracts people to this day. Tourists from all over the world come to see the gorgeous harbor and the city of Rio de Janeiro. People have even built cable cars and trains to accommodate tourists and show them around the area.



# The Northern Lights

by ReadWorks



Imagine you are somewhere far north on Earth. It's nighttime, but the sky is not dark, like you might expect it to be. Instead, it's filled with colorful lights. Some lights look like moving curtains. Others look like a steady glow, or bands across the sky. The lights are usually green, but you may see other colors, like yellow, red, purple, or blue. The lights are dazzling as they dance far above your head.

What you're imagining is the Aurora Borealis. It's also called the Northern Lights. This natural light display has wowed people for hundreds of years. In fact, it is one of the seven natural wonders of the world.

People can thank the sun for these incredible light shows. During a certain kind of solar storm, energy and small particles from the sun can travel all the way to Earth. They can enter the atmosphere near the North Pole. These particles interact with the gases in our



atmosphere. This causes the beautiful lights we see in the sky.

The color of the lights partly depends on the gas that interacts with the particles from the sun. Oxygen gives off green light or red light. Purples and blues come from nitrogen in the atmosphere.

The same kind of light show can happen near the South Pole, as well. That display is called the Aurora Australis.

It's usually easiest to see the Northern Lights in a place where it is dark. It also helps to be far north on Earth, in places such as Canada, Iceland, Alaska, and Greenland. And, of course, you're most likely to see the lights after there's a big solar storm!

# Victoria Falls: The Smoke That Thunders



*Victoria Falls in Africa*

Victoria Falls is one of the most impressive waterfalls on the planet. It is located along the border of Zimbabwe and Zambia, two countries in southern Africa. There, the Zambezi River takes a plunge, forming the giant "sheet" of falling water. Victoria Falls is considered to be the largest waterfall in the world. And no wonder - it's about one mile wide and 360 feet high!

This amazing sheet of falling water can be heard from miles away. The spray and mist from the waterfall can be seen from many miles away, too. In fact, local tribes first called the waterfall "Mosi-oa-Tunya." That means "the smoke that thunders." But the falls received another name in 1855. That year, a Scottish explorer came across the waterfall. His name was David Livingstone. He named it Victoria Falls after Queen Victoria, who was ruling Great Britain at the time.

The mist caused by the falls also supports the surrounding environment. Around the waterfall is a rainforest-like ecosystem. Many species of trees, plants, and animals thrive there. If you travel there, you may catch a glimpse of the many different raptor species nearby, like falcons and black eagles. You may even spot elephants in the national parks on both sides of the river!

Today, the site is one of the Seven Natural Wonders of the World. Hundreds of thousands of people make the trip to Victoria Falls each year. They hope to see the spectacular "smoke that thunders" in person.

# A Trip to Taughannock

by ReadWorks



*Crunch, crunch, crunch.* With each step she took, Eliza made a crunching sound on the stone path she was walking on. Her dad and brother, Kenyon, were far behind her. She always liked to run ahead. When she turned around to see if they were still there, they looked like little ants. They were at the bottom of the hill. "Come on, slowpokes!" she yelled down to them. Her voice echoed through the trees that lined the trail.

Up ahead, she could see a wooden bench. She slowly jogged to the rest stop and plopped down on a bench. To her right, she noticed an information sign. "Taughannock Falls State Park," it read in big block letters at the top. Eliza remembered having a hard time learning how to spell the tricky name. Her dad taught her how to pronounce it, "Tuh-ga-nick," but spelling it wasn't easy. Underneath the heading, there were a few paragraphs about the big waterfall at the end of trail. Eliza noticed it mentioned where the name "Taughannock" might have come from. It either referred to a Native American chief who used to live in the area, or a Native American word, "Taconic," which means "in the trees."

Eliza already knew plenty about the park, since her father often drove her and her brother there from their home in Ithaca, New York. It was only a ten-minute drive. Eliza loved going to the state park. She would try to explore new trails, or look for little frogs and lizards. She would collect stones she found pretty and add them to her collection back home.

"You know, Taughannock Falls is one of the highest waterfalls around here," her dad said when he and Kenyon reached the bench where Eliza was sitting. "We knowwww," Eliza and Kenyon said at the same time. Every time they hiked in the park, their dad always told them the same facts. "It's even taller than Niagara Falls!" their dad said, laughing. He liked to tease them.

They continued on the trail, stopping every so often for Eliza to pick up an interesting-looking

stone. After twenty minutes, they noticed a dry creek bed down off the path. The light tan stone reached far into the distance, and formed a smooth surface of rock. Eliza noticed some small puddles in some areas. "Can we go dip our feet in the water?" she asked her dad. It was getting hot, and she wanted to cool down.

"Let's go!" her dad said, and both Eliza and Kenyon went running down to the creek bed. "You know, this used to be full of water," their dad said while they peeled off their shoes. "But since this has been such a hot summer, the creek dried up."

Eliza tried to picture the smooth stone covered in flowing water, full of small fish and stones. She dipped her toe in one puddle, but it was too warm. It was shallow, so the sun heated the water. She looked for another puddle, deeper this time.

"Come over here!" Kenyon called out. He was standing by a larger pool of water, and started to splash water on his arms and legs. "This one is cool!"

After the three enjoyed what was left of the creek, they pulled their shoes on and started back on the trail. They wanted to get to the big waterfall. After walking for a while, Eliza noticed a wooden bridge in the distance. "We're almost there!" she called out. She ran ahead, like usual, knowing that the bridge meant that they were close. Suddenly, she saw it. It looked like it stretched all the way up to the clouds. The water made a loud crashing noise as it hit the rocks at the bottom of the falls. It amazed her every time she saw it.

# Velociraptors and Birds

by ReadWorks



Photo Credit Leandra Walters, Phil Senter, James H. Robins [CC BY 2.5], via Wikimedia Commons

*Velociraptor*

Dinosaurs, the reptiles which walked the earth long ago, went extinct about 66 million years ago. But today, we can see their descendants everywhere. Which of today's creatures came from dinosaurs? Some people may assume that crocodiles, alligators, or other reptiles could call dinosaurs their ancestors. But that's not the case. Rather, the animals that descended from dinosaurs are far more common and familiar. They're birds!



By Kabacchi (Velociraptor - 01 Uploaded by FunkMonk) [CC BY 2.0], via Wikimedia Commons

*Velociraptor skeleton*

Modern birds came from a group of two-legged dinosaurs. These dinosaurs are known as theropods. They include familiar dinosaurs like the fierce *Velociraptor*. This dinosaur, in particular, shows many of the similarities between birds and dinosaurs. For example, the *Velociraptor* had feathers! Scientists can tell that these dinosaurs were feathered based on their fossils. A fossil of a *Velociraptor's* forearm bone that was found in Mongolia had quill knobs, which are structures on a bone that hold feathers. Today's birds have these as well. *Velociraptors* also had hollow bones, like today's birds. And they also tended to nests of eggs, like their modern-day descendants.

In birds today, hollow bones and feathers make it easier for birds to fly. But unlike today's birds, *Velociraptors* could not fly. Their short forelimbs made it impossible to take off from the ground. Their feathers may have had other uses, like for mating displays or keeping the dinosaur's body at the right temperature.



# The King of the Tyrant Lizards

by ReadWorks

One of the best-known kinds of dinosaurs is the *Tyrannosaurus rex*, sometimes called *T. rex*. This name means "king of the tyrant lizards." The *T. rex* lived during the Late Cretaceous period. They lived from about 100 million years ago to 66 million years ago. These dinosaurs lived in western North America. That is the area where most of their fossils have been found.



*fossilized skull of a T. rex*

The *T. rex* was a carnivorous dinosaur. As a carnivore, it hunted and ate animals. How do we know this? By looking at fossils of its teeth! The *T. rex* had a mouthful of cone-shaped serrated teeth. The *T. rex*'s teeth were made for biting into prey, holding onto it as it struggled, and ripping flesh. Plus, its huge skull had a strong jaw that delivered a powerful bite. Scientists think the *T. rex* had the strongest bite of any land animal that ever lived!

Scientists have also learned how large the *T. rex* was by studying its fossils. They've learned that this massive dinosaur could be up to 40 feet long and 12 feet tall. Scientists think it would have weighed between 11,000 and 15,500 pounds. That's about as heavy as the biggest African elephant.



*T. rex skeleton*

Scientists have learned a lot about the *T. rex* by studying its fossils. Still, some things remain unclear. For example, there is still some disagreement about whether the *T. rex* was a fast or slow animal. When the first *T. rex* fossils were discovered, people assumed it was a fast predator. But since then, some scientists have studied how the bodies and muscles of large animals today work when running. They applied what they learned to animals that have long since been gone. Today, some of these experts believe the *T. rex* must have been pretty slow when running, partly because of its large size.

# Learning from Dinosaur Fossils

by ReadWorks

Dinosaurs are a group of reptiles that lived long ago. The first dinosaurs walked the earth about 245 million years ago. For millions of years, they lived and thrived. Then, about 66 million years ago, the dinosaurs were wiped out when a huge event destroyed much of life on Earth. But scientists today are still able to learn about these interesting animals. They learn about them by studying what remains of the dinosaurs - fossils.



*Fossil of a fern*

A fossil is any evidence of life from long ago that is at least 10,000 years old. A fossil can be what's left of the bones or teeth of an animal. It can also be a footprint left behind by an animal. But fossils are not just remains of animals. They can also be remains of plants, like the impression of a fern left in a rock.



*Fossilized dinosaur skeleton at a museum*

Have you ever seen a picture of a dinosaur skeleton in a museum? The dinosaur bones you can see in a museum are actually fossils. But how did these fossils form from the dinosaur's bones? This happened over millions of years, through a process called fossilization. When the dinosaur those fossils came from died, it may have been buried by sediments like sand and silt. As the dinosaur's body rotted, these sediments protected the bones from rotting. After many years, only the hard parts of the body were left behind. Over millions of years, the water in the rocks nearby surrounded those hard parts. Over time, the minerals in the water replaced the hard parts. So after millions of years, what was left was a solid rock copy of the dinosaur's bones - the fossils.





National Park Service

*Paleontologist working to unearth a fossil*

Scientists called paleontologists study dinosaur fossils to learn more about dinosaurs. They can learn about how dinosaurs lived, moved, ate, grew, and more by studying fossils. For example, they can look at the shapes and sizes of a dinosaur's teeth to see what kinds of food it most likely ate. They can study fossilized footprints to learn about how quickly a kind of dinosaur may have moved. And they can draw conclusions about how some dinosaurs behaved by studying some fossilized dinosaur eggs and nests.

# When Pterosaurs Took Flight

by ReadWorks



*A model of a pterosaur*

Hundreds of millions of years ago, ancient reptiles called dinosaurs walked the earth. But another kind of ancient reptile, a cousin of the dinosaurs, also shared the planet. They didn't walk the earth, though... they flew its skies! These prehistoric flying reptiles were pterosaurs.

Pterosaurs lived on earth for about 150 million years before dying out about 66 million years ago. Over that time, the earliest pterosaurs evolved into different species of pterosaurs that varied widely. Some pterosaurs had complicated crests on their head. Some had long tails, and others had short tails. And while some pterosaurs were as small as sparrows, others were as large as planes. But one thing that united all pterosaurs was their ability to fly. Pterosaurs were the first animals after insects to fly using their own power. They did not just jump or glide on the wind. Rather, they flapped their wings to travel by air.





andytang20, CC BY 2.0

*Skeleton of the Quetzalcoatlus pterosaur in a museum*

How did pterosaurs take to the skies? The answer lies in the structure of their bones. Pterosaurs' wings evolved from the front legs of their ancestors that lived on the ground. Over time, the bones in those ancestors' arms and hands got longer. One finger bone got especially long. These long bones held up the skin that made up the pterosaurs' wings.

Pterosaurs' wing bones also were hollow tubes. The walls of the bones were extremely thin. The bones themselves were flexible and light, but strong. Because these bones were strong and light, they allowed pterosaurs to get off the ground and stay in flight. That's how such large pterosaurs as the *Quetzalcoatlus*, which had a wingspan of about forty feet, were able to stay aloft!

# Sauropods: Giants on Earth



*This is what some sauropods may have looked like.*

Hundreds of millions of years ago, dinosaurs walked the earth. These ancient reptiles were very diverse, ranging in size, diet, movement, habits, and more. One group of dinosaurs was called the sauropods. These were the giants that many people today imagine when thinking of dinosaurs. They generally had large bodies and long necks. They walked on four legs and had a small head.

Just how big were the sauropods? Like other groups of dinosaurs, the sauropods differed in size from species to species. As a group, the sauropods included the largest land animals ever to exist. Many of the biggest sauropods were part of a subgroup called the titanosaurs. One titanosaur, the *Argentinosaurus*, was almost ten times bigger than the largest land mammals today. It may have grown to weigh 90 tons. That's more than twelve times as heavy as a large elephant! Other huge sauropods, like the *Apatosaurus* and *Brachiosaurus*, reached lengths of 65 to 100 feet from head to tail. And even the smaller ones were not very small. A small sauropod could reach a length of 50 feet!



*Skeleton of a sauropod*

Sauropods didn't always start out big. When a sauropod hatched from an egg, it usually weighed less than 11 pounds. But sauropods grew extremely quickly over the course of about thirty years. By the time they were done growing, they would have been at least 10,000 times heavier than when they were born! This quick rate of growth probably helped sauropods stay alive. The larger a baby sauropod was, the more likely it was to be able to stay safe from predators. This may have contributed to the overall large size of the sauropod group.

If larger sauropods were more likely to survive, then why weren't there even bigger sauropods? Scientists think that it probably would have been impossible for even larger sauropods to evolve. There simply wouldn't have been enough food to feed such huge creatures! Also, scientists think that if sauropods had gotten much bigger, their bones might not have been able to support their weight. Sauropods were about as large as they could possibly be.

# The Swimming Dinosaur

by ReadWorks

Hundreds of millions of years ago, dinosaurs walked the earth. Some of them were fierce predators, like the *T. rex* and *Velociraptor*. Most of these carnivorous dinosaurs stayed on land, hunting and living on solid ground. But the largest known carnivorous dinosaur is thought to have spent most of its time in the water. This 50-foot-long swimming dinosaur is called *Spinosaurus*.



By Ryan Somma, CC BY 2.0

*Spinosaurus skeleton*

The *Spinosaurus* lived about a hundred million years ago, during the Cretaceous period. It lived in North Africa, where there used to be many swamps and large rivers. It had many distinct features. One special feature was the set of spines for which it was named. The *Spinosaurus* had very long spines growing on its back. They were up to 7 feet long! They were likely connected by skin, forming what scientists call its "sail." It most likely was not used as the dinosaur swam, however.





By Ryan Somma, CC BY 2.0

*Spines of a Spinosaurus*

Scientists have studied *Spinosaurus* fossils to learn more about the dinosaur. The *Spinosaurus* fossils show that the dinosaur had plenty of features that suggest that it spent much of its life in the water. For example, its hind legs were shorter than the hind legs of other carnivorous dinosaurs, like the *T. rex*. Also, its feet were shaped almost like paddles, with wide claws. Additionally, the *Spinosaurus* had smooth, interlocking teeth shaped like cones. This is similar to today's fish-eating crocodiles and different from other predatory dinosaurs that stalked their prey on land. It suggests that the *Spinosaurus* ate large fish. The *Spinosaurus* also had nostrils on top of its head. This placement would have helped it as it spent lots of time in or under water. And finally, the dinosaur had very dense bones. Animals today with such dense bones spend most or all of their time in water. By studying the fossils of *Spinosaurus*, scientists have begun to piece together a better picture of this water-dwelling dinosaur.

# Amra and the Skateboard

by ReadWorks



The skateboard flew down the hill. Buzzing over the pavement, it passed by houses with manicured gardens and freshly cut grass, and whizzed past prim and proper homeowners—middle-aged mothers with beehive haircuts and stern-looking fathers with Oxford button-downs tucked into crisp khaki pants. At the bottom of the hill, it slammed into the curb and landed violently on its side.

Amra was searching for worms in her front yard. She was on her hands and knees when she heard the whizzing crack. Startled, she shot her head up and scanned the scene.

She saw the skateboard to her right, lying on the sidewalk. To her left, high up on the hill, she saw a gaggle of boys. Blinding rays of light carved out their silhouetted figures. The outlines of kneepads and helmets could be made out, as well as other skateboards, some held like canes, others like briefcases. One among the crew was sitting on his bottom, rocking back and forth in mild pain. He had wiped out.

Amra walked over to the skateboard. She took it into her hands and looked up toward the boys. One of them beckoned to her with his hand.

"Bring it up!" he called out.

The thought of interacting with them set her nerves on edge. She was only 10. They were older-high-schoolers.

Amra slowly walked the skateboard to the top. The boys stood there expressionless.

"Thanks kid," the one who wiped out said.

He walked over and took the skateboard from Amra's arms.



"Can I try?" she asked him.

The boys laughed.

"You're just a kid," Wipe Out said.

"And you're a girl," added another.

More laughter.

Amra shot an angry look. "Let me try!"

Wipe Out smirked. "Okay," he said, and handed back the skateboard.

Amra laid it on the pavement and rolled it back and forth to get the feel of the concrete.

Stepping her left foot onto the front of the skateboard, she crouched and shot off, zipping down the hill and landing on a strip of grass along the sidewalk.

When she lifted the skateboard over her head in triumph, the boys were dumbfounded.