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Jane Goodall

Science in Action:
Laura and Sandra

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Science in Action: Laura and Sandra

Core Knowledge®

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CHAPTER
1

Birds and Bridges

Seven-year-old Laura woke up one sunny June day. Sitting in bed, Laura could hear the birds chirping outside. It felt like it was going to be a good day.

"Laura, are you up? Rise and shine." Her mom knocked on the bedroom door before opening it. "I promised you a treat after second grade. Do you want to go to the public swimming pool today?"

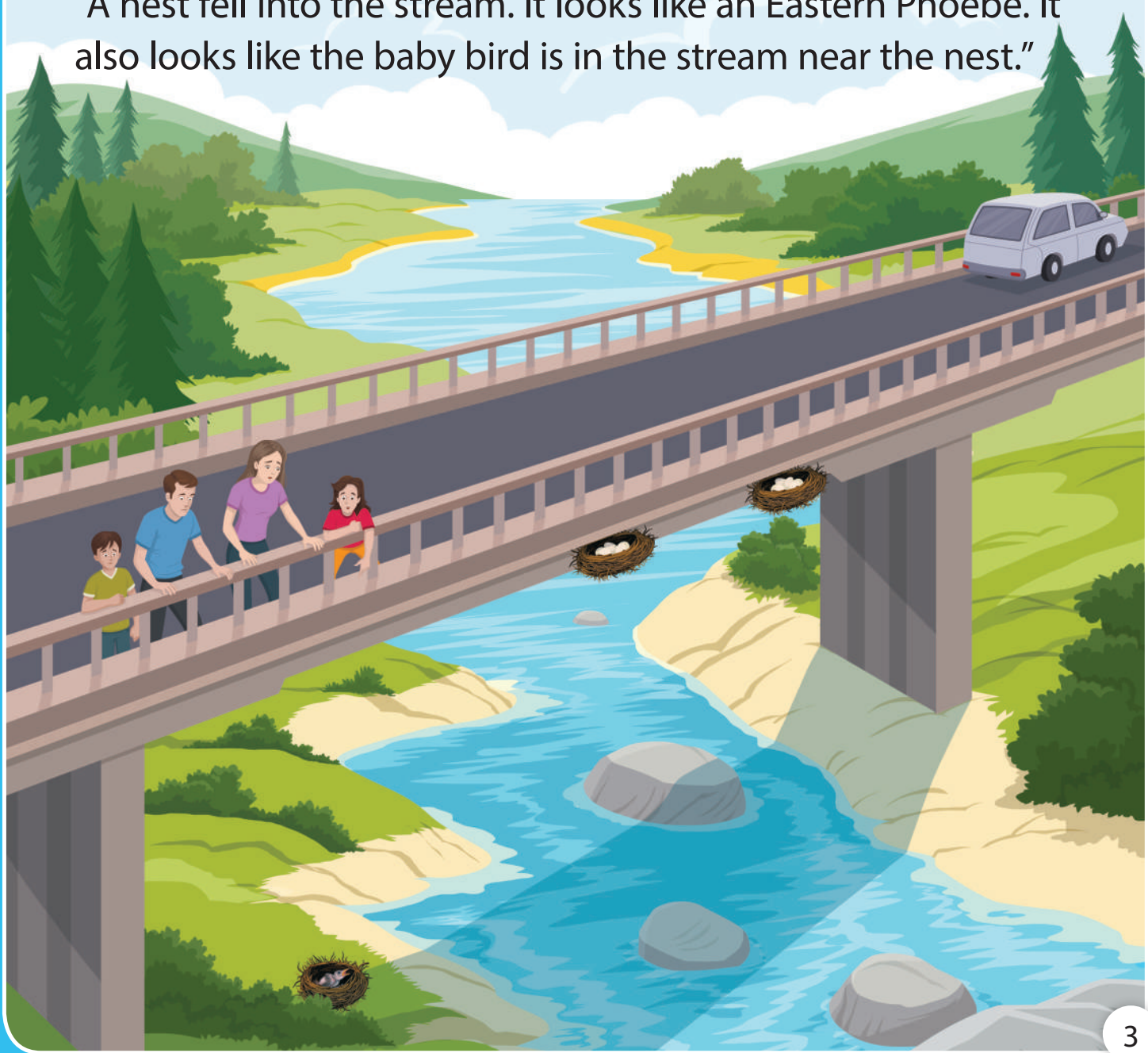
"Yes, yes, yes." Laura replied.

"Well, get up and have some breakfast. We can leave once you are ready." Her mom said.

On the way to the pool, Laura and her mom drove over a bridge. The bridge went over a small stream. Near the end of the bridge, there were a lot of people standing. The people were looking down at something on the edge of the stream.

Laura's mom parked the van. They walked over to the crowd of people. "What's everyone looking at?" Laura asked.

"A nest fell into the stream. It looks like an Eastern Phoebe. It also looks like the baby bird is in the stream near the nest."



“We have to help it, Mom. Let’s go down there.” Laura said.

Laura’s mom thought for a moment and said, “That may not be the right way to help. Let me look up what the wildlife rescue center says to do.” Her mom used her phone to find the nearest wildlife rescue center.

“The wildlife rescue center said we should put the nest and baby bird in a box. We should keep the box dark and quiet.” Mom said.

Laura’s eye brightened, “Well, let’s get the bird out of the stream and into the box.”

Laura's mother knelt down and picked up the nest with the baby bird in it. "Stand back Laura. I want to make sure neither of us gets scratched." she explained. Her mom placed the nest and baby bird into the box.

Laura looked down at the baby bird. "I'm going to put a towel over the box. You'll be safe. We are going to take you to see an animal doctor."

"Should we put some food and water in the box with the baby bird?" Laura asked her mother.

"No," he replied, "the wildlife website says not to give food or water to an injured animal until it has seen the veterinarian."

They climbed up to their van and drove to the wildlife rescue center.

Laura's mom drove to the wildlife rescue center. She carried the box inside while Laura held the door open. Dr. Ortiz looked at the box and said, "What do we have here?"

Laura's words came spilling out. "It's a baby bird. It was crying so loud. But it fell into the stream along with the nest. What can you do?"

The vet took the baby bird and nest out of the box. Dr. Ortiz gently felt the animal, checking for broken bones. She said, "Laura, you did the right thing calling the wildlife rescue center. I have special training with wild animals and have even cared for injured chimpanzees and monkeys."

"I will put this wild baby in a dark and quiet part of my clinic and keep an eye on it for a few hours. Then, if all seems well, the wildlife rescue team will raise the little fellow until he is ready to live on his own. They know how to release them when they are able to care for themselves."

To avoid frightening the baby bird, Laura said her goodbyes in a tiny

whisper. “So long, little guy. I hope you get well and will get to live outdoors. You belong where there are trees, bushes, and other birds.”

On the ride home, Laura was lost in thought.

"What are you thinking?" asked her mom.

"I'm thinking about what I want to be when I grow up," she replied. "I want to be a vet. But not a vet that takes care of dogs, cats, and horses. I want to be a vet like Dr. Ortiz. One who takes care of wild animals, like the chimps, gorillas, and zebras we see on television."

Laura thought about other animals she could help if she became a wildlife vet.

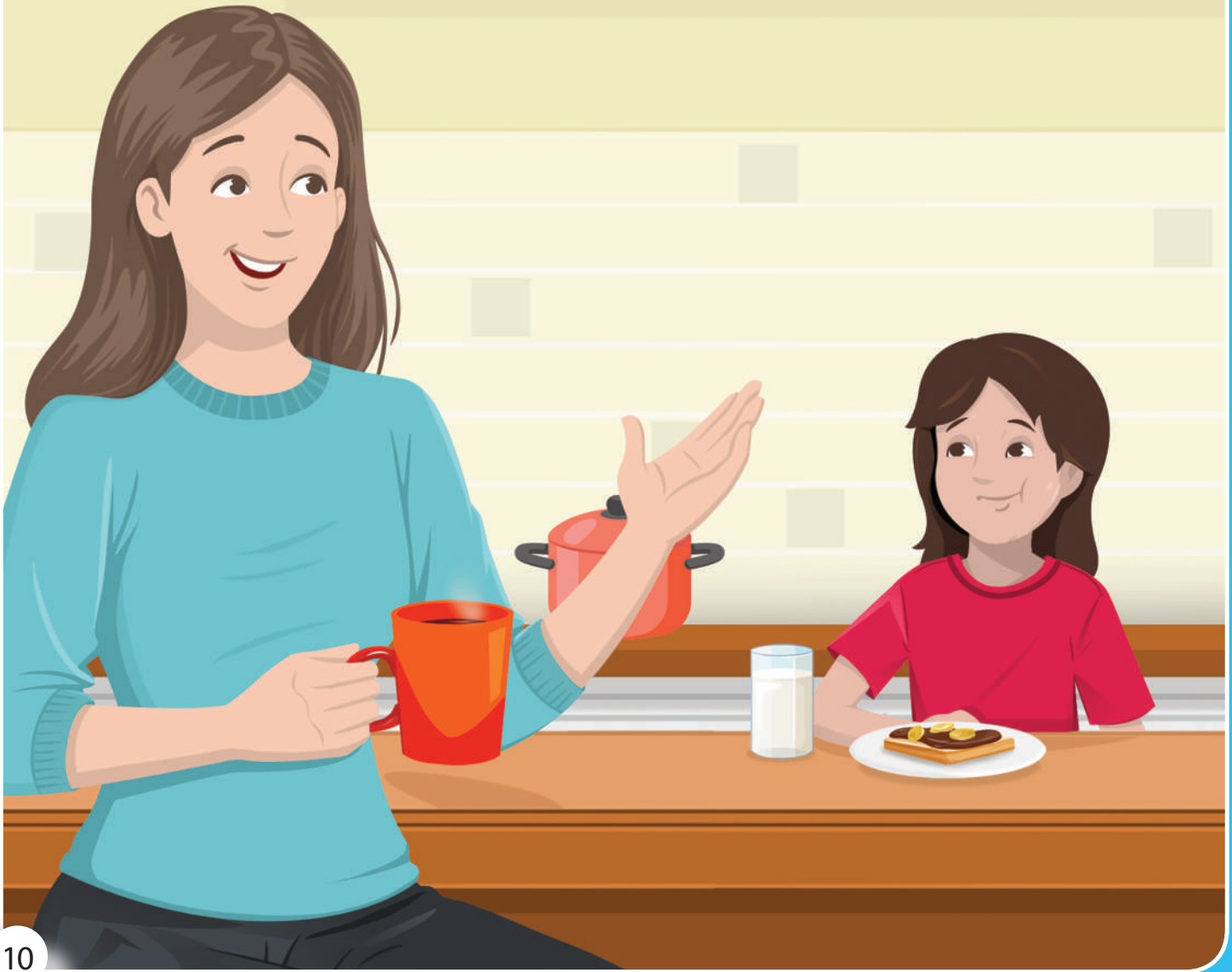
Giraffes? Hippos? Elephants? Whales?

Her mom laughed to think of how hard it would be to bring those huge wild animals to a vet's office.

"Laura, you are going to have to be an outdoor vet. You will have to go take care of the animals where they live."

Laura woke up the next day and remembered the baby bird. The backyard was quiet this morning. Laura walked into the kitchen and found her mom there, sipping coffee. She looked thoughtful.

"Laura," she said, "you did a good job thinking like a scientist to help the baby bird yesterday. There are many kinds of wild animals in the world that scientists work with. You will investigate and learn a lot!"



Laura pictured all the caterpillars, earthworms, birds, and bugs in her own backyard.

Then her mother said, "How about going on a hike today? I know where there is a pond full of frogs you can catch and investigate!"

CHAPTER
2

Laura Stark: Wildlife Explorer

Laura, the main character in Chapter 1, is a real person who is now a grown-up. Laura Stark is a scientist. She still loves wild animals. She still loves exploring outdoors. She still remembers the fun of catching frogs and learning about them.

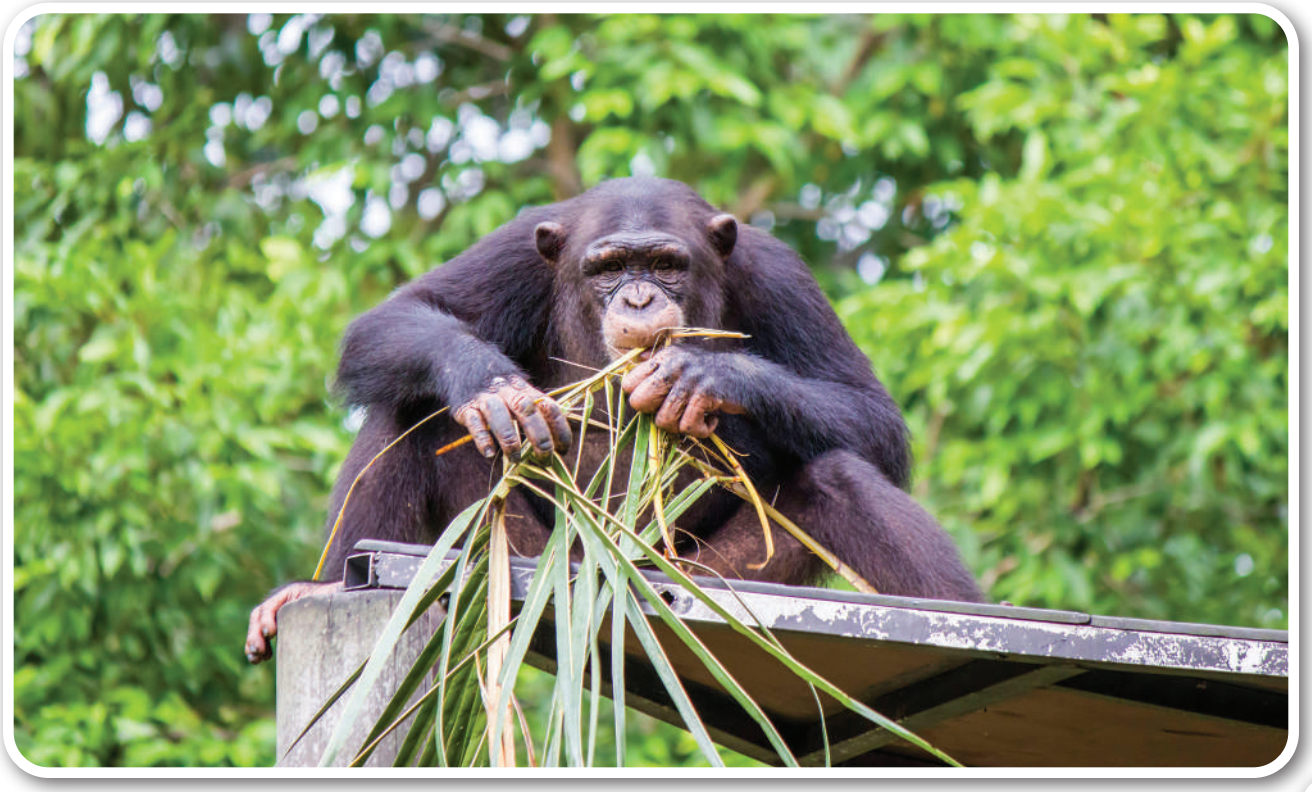
So, when she started college, she worked in a vet's office. The job kept her indoors. That was not fun for Laura. So, she changed her plan.

Knowing that she wanted to work outdoors, she helped a professor research songbirds. She would get up at 4:40 in the morning to set up nets in a forest! When birds got caught by a net, she put ID bands on them. A band is "a little bracelet on their leg with a number," Laura explains. Then she would let the bird go. If the bird was caught again, scientists would know which bird it was.

When Laura finished college, she wasn't sure what kind of science to do next. "I was still figuring out the path that I wanted to go on," she recalled.

Still interested in great ape conservation, Laura worked at a sanctuary for these animals. In a sanctuary, the chimps are cared for. They get to be with other chimps.

They are free to move around outdoors and go indoors.



Next, Laura tried farming! She planted vegetables and harvested them when they were grown. She remembers all the hard work on a farm. “I think everyone should try to farm at some point,” she says, “to see where your food comes from.”

Working as a farmer, Laura missed doing science investigations. So, she went back to school. Guess what creatures she investigated next? Earthworms!

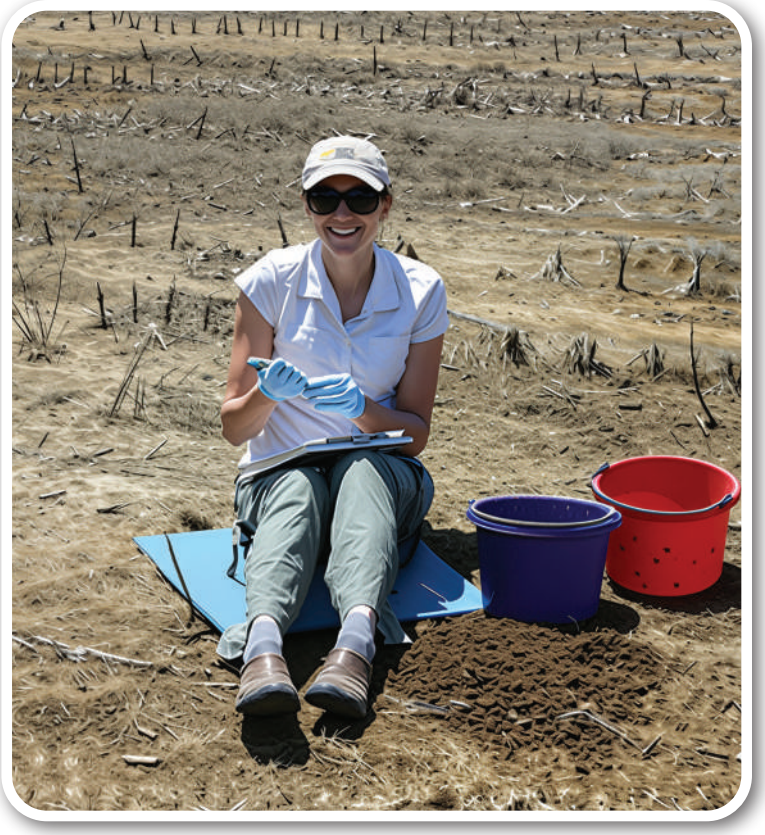
You might think that earthworms have always lived in the soil around you. Many species came to America from other parts of the world. Laura investigated many kinds of worms. She noticed what plants grew in the same soil with different worms.

How did Laura tell one kind of worm from another?

Look at the photo. Notice the lines that go around the worms. Those lines separate body parts called segments. Now look for the body part that looks like a wide ring around each worm. Scientists count the segments from the mouth to the ring to figure out what kind of worm it is.

Most of the time, earthworms live underground. How did Laura know where to dig to find them? "If you pour mustard powder mixed with water in the ground, earthworms come to the surface," she explains. "It's pretty cool."

Think about hiking in the woods. Imagine that along the trail you see a young woman pouring a bucket of yellow water on the ground. What questions would you ask her? Laura always paused to explain her work to passersby. She answered many questions about the science work she was doing.



Laura knows that earthworms eat leaves that fall from trees. The worm's waste becomes part of the soil. People like earthworms in their gardens and farms but many worms are not native. They disrupt the balance of nature. They eat leaves that native animals need. They disrupt native plant life too. Laura studies the effects of these invasive worms.

When Laura finished school, she could call herself a biologist. A biologist is a scientist who investigates living things. Her first job as a biologist was on a farm. The team of scientists on that farm try to understand how farms can offer habitat for insects, wildlife, and native plants. They study how those plants and animals can benefit the farm.

They compare the insects living on the farm to those that live in the forests.

They find out what kinds of butterflies live on the farm and around it.

They also look at all the different kinds of birds found in the area.

Laura is also investigating insects that live in soil. The insects in the soil are native and important for plants, whereas the earthworms are invasive.

Laura enjoys investigating living things on the farm. It is also helpful to people everywhere. Why? People are living things. Humans need other living things. For example, people need food from plants. Plants grown on farms need insects to make fruit. Without pollinators like bees, we would not be able to grow the apples, cherries, grapes, peaches, and tomatoes that we eat.

Insects and other animals that plants need to make fruit are called pollinators. Laura finds many kinds of bee pollinators on the farm. How does she tell one kind from another? Compare all the bees shown here. What differences do you observe?

Laura has had many adventures in science. She didn't always know what would come next. But that often happens in science. Each experience leads you to ask more questions. In trying to answer them, you follow a new path and have an unexpected adventure.

Columbia County NY, is where Laura studies ecology.

Laura says that her science teachers were very important to her. Perhaps her first science teachers were her parents. They encouraged her to explore outdoors. They took her on hikes. A science teacher Laura had in high school made her excited to learn, too.

A science teacher in college was also important to Laura. Her name is Dr. Belinsky. Dr. Belinsky investigates different types and different sizes of birds in forests. She investigates which birds use nest boxes that are installed in forests and suburbs. She puts her students to work catching birds and putting bands on their legs.

This hawk has bands on both legs.

Inspired by . . .

To be **inspired** by someone means they made us want to try something.

Jane Goodall, Chimp Expert

- English zoologist
- Given a soft toy chimp when she was a baby
- Graduated from universities
- Met Louis Leakey in Africa
- Began studying chimpanzees in Africa in 1960

Dian Fossey, Gorilla Expert

- American primatologist
- Graduated from universities
- Met Louis Leakey in Africa
- Began studying gorillas in Africa in 1960 to see how they lived

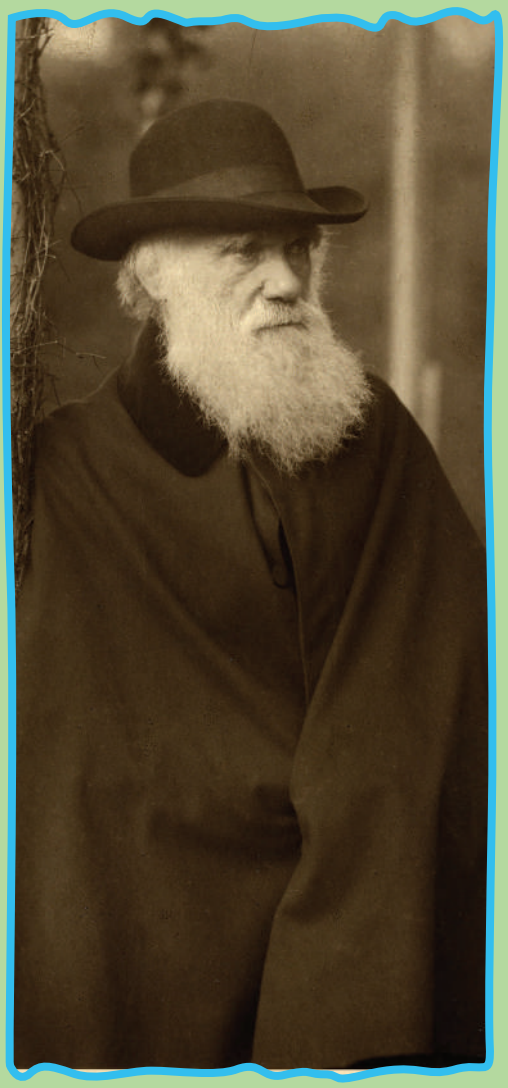
Neat Work

- Discovered that chimpanzees use tools much like humans
- Promotes protecting wild chimps from humans

Neat Work

- Discovered that gorillas are gentle animals
- Promotes protecting gorillas from humans

Laura Stark was inspired by Jane Goodall, Dian Fossey, and Charles Darwin.



Charles Darwin, Naturalist

- English scientist
- Graduated from universities
- Traveled to distant places to study the living things there
- Developed the idea that living things change over long periods of time

Neat Work

- Observed and described how animals acted
- Wrote about how living things change over time
- Studied earthworms

FUN FACT: Being a curious scientist is something you can do your whole life.

Who inspires you to find out more about the way things happen? Who has helped you figure out how something works?

CHAPTER
3

Tumbling into Science

Seven-year-old Sandy lived in a small house in a small town. She was a curious girl who loved collecting things she found outdoors. She brought flies home in jars to observe them. She picked up acorns and pine cones and kept them in a shoebox. Whenever Sandy returned home from a walk with her family, her pockets would be bulging with rocks she had collected.

On her birthday, Sandy's parents gave her a big box covered in wrapping paper. They sang "Happy Birthday to You," and Sandy grinned.

She eagerly tore the wrapping paper off the box. Looking at the strange machine inside the box, she asked, "What does it do?"

"It's a rock tumbler," her mom explained. "You put rocks in it, with water and grit. When we turn it on, the machine will make the rocks tumble over and over. In a few weeks, the rocks will be smooth and shiny."

Sandy ran toward her bedroom. She said, "I'll get some rocks from my collection to put in the machine."

"Come back," said Mom. "Some rocks came in the box. Let's try those first."

Sandy's parents helped her read the directions. They set up the tumbler on the kitchen counter. They put the rocks inside the round drum. Then they added water and the sandy grit labeled "Number 1."

Soon after, Sandy's grandfather called from Chicago to wish her a happy birthday. "What's that racket I hear?" he asked.

"It's my new rock tumbler! We put rough, gray rocks into the machine, and it's supposed to make them shiny. It takes a long time," answered Sandy.

Sandy's mom and dad looked at each other. They held their hands over their ears. "I think the rock tumbler should move to the garage," Dad said. "That way we can get some sleep!"

When the call with her grandfather ended, Sandy said, "I don't know if I can wait to see the rocks. I wish I had something to read about rocks. Or even about animals or places around the world—something with new discoveries."

"I know what we can do, Sandy," said Mom. "Let's stop by our church. Mrs. Johnson, who goes to our church, left a pile of science magazines that people can take home."

They found the magazines on a table. “Help yourself, Sandy!” Mrs. Johnson encouraged. “Take as many as you want.”

The *National Geographic* magazine on the top of the pile had a picture of dolphins diving in the ocean. Sandy found the pages that explained how scientists learn about dolphins. “That is what I want to do when I grow up!” she told Mrs. Johnson.

“So you want to be a marine biologist! Wouldn’t that be exciting? To go help dolphins and protect them from the dangers they face.?” Mrs. Johnson replied.

Sandy and Mrs. Johnson talked about dolphins and whales for a long while. Sandy had so many questions.

How can I protect dolphins?

What other living things harm dolphins?

What do they eat?

How do dolphins behave?

What do their sounds mean?

How deep can they dive?

Mrs. Johnson said, "I'll be on the lookout for more magazine articles about dolphins and whales. I'll be sure to save them for you."

Sandy took the magazine about dolphins home with her. At bedtime, she took the magazine and a flashlight to bed with her. She continued to study the pages well past her bedtime.

That night, she dreamed about helping dolphins. She slipped over the side of a boat into warm ocean water. Soon a dozen dolphins appeared. Sandy floated quietly in the water without moving. She held her breath.

The dolphins circled around her. Some swam close and touched her with their fins. She could hear the sounds they made. Just as suddenly as they had appeared, the dolphins swam away, jumping above the waves. Then they disappeared below the water's surface.

The next day, Sandy told Mrs. Johnson about her dream. “Why did they disappear?” Sandy asked.

Mrs. Johnson was thoughtful. “I read that dolphins sleep during the day and hunt for food at night. I suppose the dolphins might have gone to get some sleep,” she said.

“When I am a marine biologist, I’ll really get to swim near dolphins,” Sandy told Mrs. Johnson.

“Oh, Sandy, you would be a great marine biologist! And from all I’ve learned from you, I know you would be a great teacher, too,” Mrs. Johnson replied with a smile.

And so, Mrs. Johnson did just what she promised. For many years, she brought Sandy science magazines. They talked about what they read. Those magazines helped Sandy learn about science.

Six days after Sandy's birthday, it was finally time to open her rock tumbler. Sandy's mom unplugged the machine. Sandy was eager see if the rocks had changed. She opened the drum and poured the rocks into a strainer. She put the strainer in the sink and rinsed off the rocks.

"Not much change yet," she said with disappointment.

"They need more time and more grit," explained her mom.

So, they put the rocks back into the tumbler and added grit from the package labeled "Number 2." They added water and turned on the machine. After another six days, they did the same thing, this time using grit labeled "Number 3."

"They look smoother now," said Sandy. "Let's try grit Number 4 for six more days."

When Sandy and her mother opened the tumbler and washed the rocks, she was amazed. "Wow! The rocks have changed so much. Now they are colorful and shiny!" she said.

What are you going to do with them?" Sandy's mom asked her.

"I'm going to put the nicest rock on a necklace and give it to Mrs. Johnson," Sandy replied.

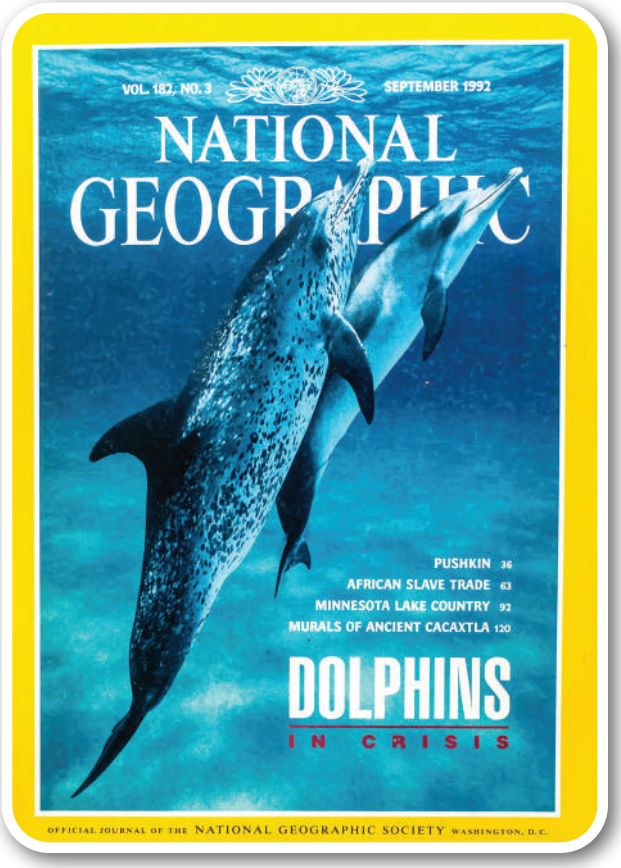
And Sandy did just that. Mrs. Johnson put the necklace on and gave Sandy a big hug.

CHAPTER
4

Sandra Fischer: Always Learning

Young Sandy, who you read about in Chapter 3, is a real person. Sandra Fischer, who inspired the story, is now a real grown-up and still a person who loves science. She really did collect flies! And Sandra did get a rock tumbler when she was seven years old.

The story of how Sandra Fischer got the idea to be a marine biologist is also true. When Sandra was young, Mrs. Johnson gave her a magazine with dolphins on the cover. She read about how scientists investigate these animals. Mrs. Johnson encouraged Sandra's interest in science. She and Sandra each read the articles. Then they talked about them.



Sandra held on to her dream of becoming a marine biologist. But, one day, a math teacher told her she wasn't good enough at math to become a scientist. Sandra felt sad, but she did not give up on her dream.

When it was time for college, Sandra chose one in Galveston, Texas. It was far from her family in New York. But it was a good place to learn more about many kinds of marine life.

The circled area is where Sandra worked.

Sandra could see dolphins in the bay. She observed them from the shore and also from boats.

She could see them swimming near boats.

The rich marine life around Galveston, Texas draws many visitors who love of study nature—and Sandra was actually studying marine life!

Sandra studied the biology of dolphins and was devoted to helping protect them by studying hard in her classes.

Sandra learned that dolphins sometimes get stuck in shallow water or on beaches. These animals are usually sick, hurt, or very young. Other times, dolphins get tangled in fishing nets. People who are trained to rescue dolphins try to help.

Sandra volunteered to help protect and save dolphins too. She hoped to get a job near her college in Texas. There, she could work on a team that helps dolphins, whales, seals, and sea lions.

Sometimes, large groups of marine mammals get stranded together on a beach. Then many people are needed to help the animals. Like Sandra they wanted to protect marine life.

Many of these animal were injured by debris and drift nets. After freeing them, Sandra knew many could be healed and released.

But Sandra's plans changed when her mom got sick. Sandra moved back home to help her family. She realized that working as a marine biologist wouldn't be practical near her home.

A friend suggested that Sandra try teaching. Sandra liked the idea and took the steps needed to become a teacher. When she finished her teacher training, she became a science teacher at a school near her home.

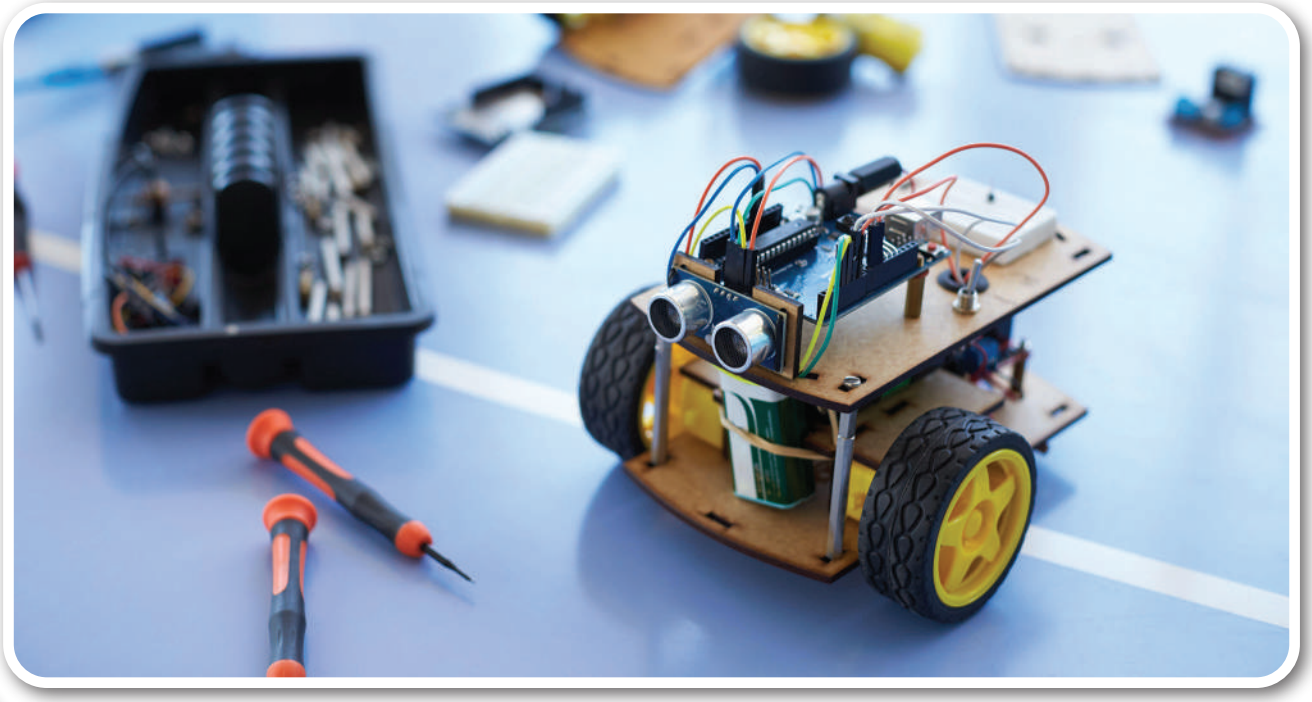
If you could visit Mrs. Fischer's science classroom, this is what you would see.

There's a huge aquarium with clownfish.

There are plants everywhere. She has frogs. The walls are painted with science murals.

She has free snacks for her students.

Mrs. Fischer is also a robotics coach at her school. She won an award from the local TV news station for being a great science teacher.



Mrs. Fischer knows it is important for students to learn outside the classroom. She took her students on a sailing ship on the Hudson River. They learned about rivers and the living things found there. They sailed on a special ship called The Clearwater. This ship is dedicated to protecting the water and living thing in New York's largest river.

On another field trip, they went to the Lucky Rehabilitation Wildlife Center. They learned how people help injured and orphaned animals. Mrs. Fischer is trained to care for wild animals. When she is not with her students, she is often working at the wildlife center.

Mrs. Fischer loved teaching. But she continued to learn more science. So, she went back to college and investigated monarch butterflies.

Monarch butterflies visit New York State in the summer. They lay their eggs on milkweed plants growing in fields. When the eggs hatch, the caterpillars eat the milkweed leaves.

Monarch butterfly

There are not as many monarch butterflies now as there used to be. Scientists are trying to learn how to help. Mrs. Fischer's team thought that more milkweed plants might help. So, they planned an investigation to find out.

Here's how the investigation went. Mrs. Fischer found two fields with milkweed plants near her home.

Milkweed plants

One field was left alone all summer. The other field was divided into parts. One part was mowed early in the summer. Another part was mowed late in the summer.

Mrs. Fischer counted monarch butterfly eggs and caterpillars in the various fields.

She found that mowing helped! The field mowed in early summer had more eggs and caterpillars than the other fields. The butterflies seemed to like just-sprouted milkweed plants more than older plants.

Inspired by . . .

To be **inspired** by someone means they made us want to try something.

Charles Darwin, Explorer

- English scientist
- Graduated from a university
- Sailed to South America to explore in 1831
- Explored the plants, animals, and geology each time the ship reached land

Neat Work

- Studied fossils, rocks, and how continents move
- Studied animals and plants

Jane Goodall, Chimp Expert

- English zoologist
- Graduated from universities
- Met Louis Leakey in Africa
- Began studying chimpanzees in Africa in 1960

Neat Work

- Gave speeches about saving the places where wild animals live. Sandy Fischer saw her give a speech at one event.

Sandy Fischer was inspired by Charles Darwin, Jane Goodall, and especially Rachel Carson.

Rachel Carson, Naturalist

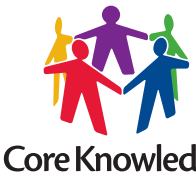
- American marine biologist
- Graduated from universities
- Enjoyed writing when she was young

Neat Work

- Wrote a trilogy of books about life by the sea
- Tried to get people to think about how humans affect other living things

FUN FACT: Her first story was published when she was eight years old. Her last book, *Silent Spring*, came out when she was fifty-five years old.

Who inspires you to find out more about the way things happen? Who has helped you figure out how something works?



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