

PIONEER EDITION

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JANUARY-FEBRUARY 2010

NATIONAL GEOGRAPHIC Explorer!



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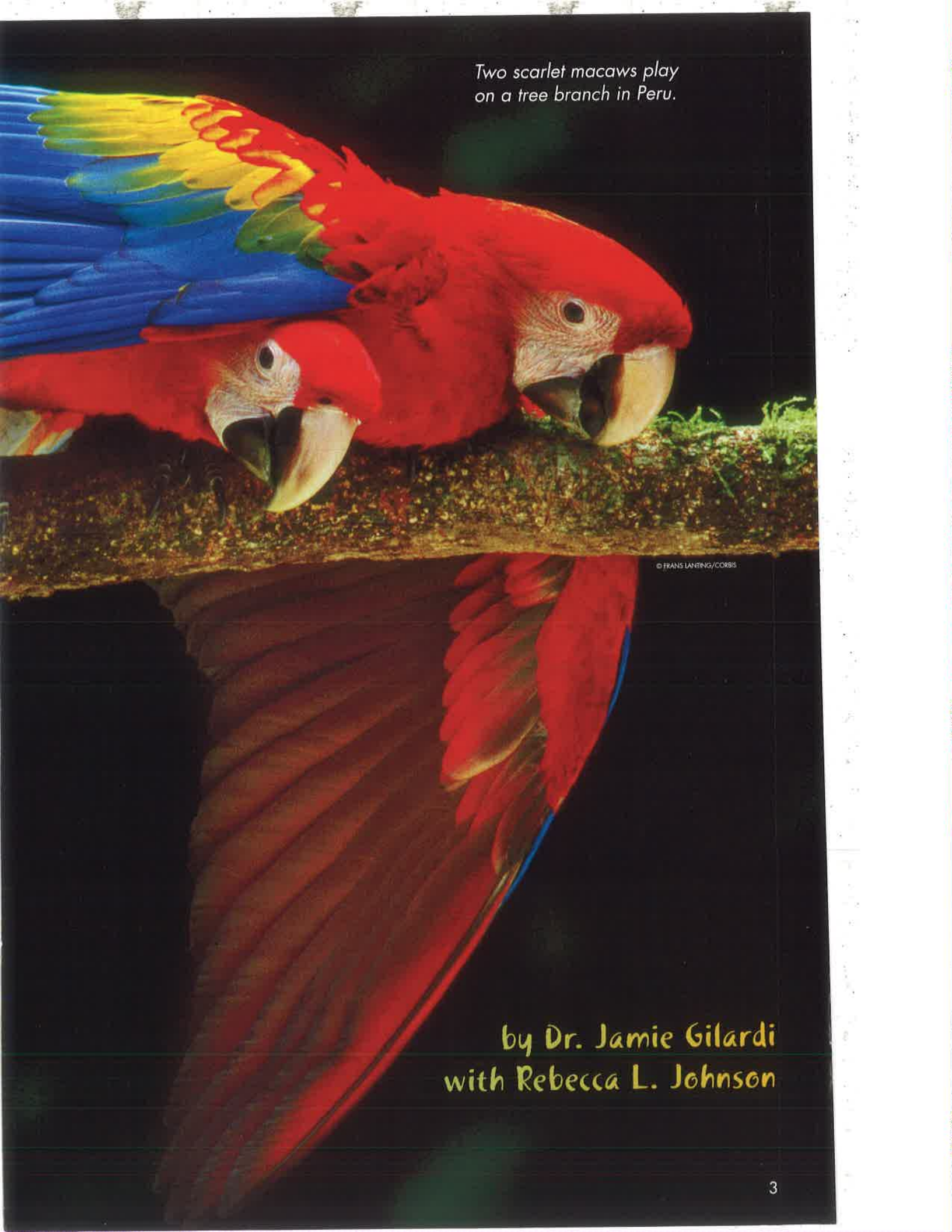


Reading Strategy: Read this story to find out what people are doing to protect wild parrots in Peru.



A Passion for Parrots

For many years, trappers have caught wild parrots to sell as pets. See what some people are doing to protect these beautiful birds.

A photograph of two scarlet macaws perched on a tree branch. The macaw in the foreground is shown in profile, facing right, with its large, hooked beak clearly visible. Its feathers are a vibrant red, with blue and yellow-green feathers on its wings. The second macaw is perched slightly behind and to the left of the first, also facing right. The background is dark and out of focus, showing some green foliage. The entire image is set against a black background.

Two scarlet macaws play
on a tree branch in Peru.

© FRANS LANING/CORBIS

by Dr. Jamie Gilardi
with Rebecca L. Johnson

Water gently rocks our canoe. It's early morning on a river in Peru. Soon, we reach the shore and hike to a small hut. Listen. I can hear wings flapping! The clay-eaters are coming!

Screeches fill the air. First I see blue-headed parrots. They land on a nearby cliff. Soon they start to gobble up bits of clay.

A Mystery Solved

I'm a biologist. That means I study living things. I am here in the Amazon rain forest to learn about wild parrots.

To see them, I visit a clay lick. It is on a riverbank near the village of Sepahua. Each morning, hundreds of parrots come here to eat clay.

I first came to Peru in the 1990s. I wanted to learn why the birds ate clay. I watched them. I collected what they ate. I also took samples of the clay. Then I ran some tests in a lab. Here's what I learned.

Rain forest parrots eat lots of seeds. Many of the seeds have toxins, or poisons. These poisons can make the birds very sick. That's where the clay comes in. It keeps the poisons from hurting the birds.

Beauty and Brains

I love to watch parrots at the clay lick. They are beautiful. They also move in interesting ways. Parrots can hang upside down by one toe!

Parrot families stick together. Their squawks fill the air. They're not just making noise. Parrots use these sounds to send messages to each other. Some are so smart they can copy human speech.

Sadly, their beauty and brains have made parrots *too* popular. Many people want them as pets. So hunters have trapped millions of wild parrots. They sell the birds to the **pet trade**. Now, wild parrots are in danger.

Parrots at Risk

Rain forest surrounds the Sepahua clay lick. Once, only Machiguenga Indians lived here. They killed parrots for food. They kept some as pets. Still, there were plenty of parrots left in the rain forest.

Then loggers came to cut trees. Miners came for gold. Finally, parrot hunters arrived. Birds at the clay licks were easy to catch. The hunters took as many as they could. Something had to be done!

Trappers target the macaw for its beautiful feathers.



Eating clay protects parrots from toxins in seeds.



© ANDRÉ BAERTSCH/WILDTROPEN.COM

This blue-and-yellow macaw has a powerful beak. It can crush a hard Brazil nut.



Parrots have four strong toes.

Taking Action

People who cared about the birds went to work. We met with the government in Peru. We said that the parrots could disappear forever. The government listened.

It made parts of the rain forest into new national parks. It made older parks bigger. The parks now included important clay licks.

Some clay licks were outside the parks. To protect those licks, groups started ecotourism projects. They built small lodges near the clay licks. Tourists stay at these lodges and visit the parrots. The tourists' money goes to protecting the parrots.

Parrot Art

Sepahua village is deep in the forest. It's too hard for tourists to reach. So people in Sepahua raise money in a different way.

They make beautiful cloth wall hangings. Their art shows life in the forest. People sell the art to pay for guards. The guards protect birds at the Sepahua clay lick.

More Progress for Parrots

Sadly, trappers still catch parrots in other places in Peru. But that is changing! The government has cut the number of parrots that hunters can take. Hopefully, in time, all trade in Peru's wild parrots will end.

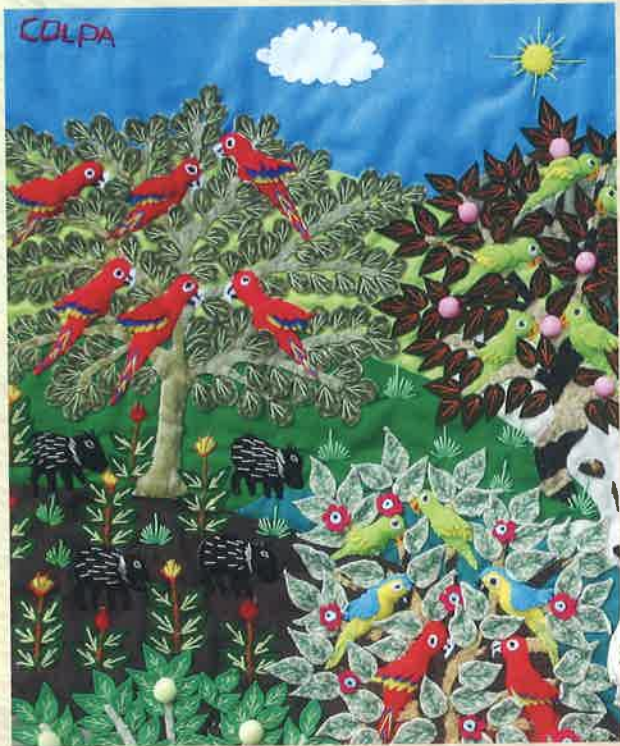
Indonesia and Mexico have stopped **exporting** wild parrots. That means they stopped selling them to people in other countries. In 2007, countries in Europe stopped **importing**, or buying, wild birds.

Today, almost all of the legal wild bird trade has stopped. The parrots you see at pet shops in the United States were not born in the wild. These parrots were raised **in captivity**. Still, think hard before buying one. They need lots of attention and care.

Living Wild and Free

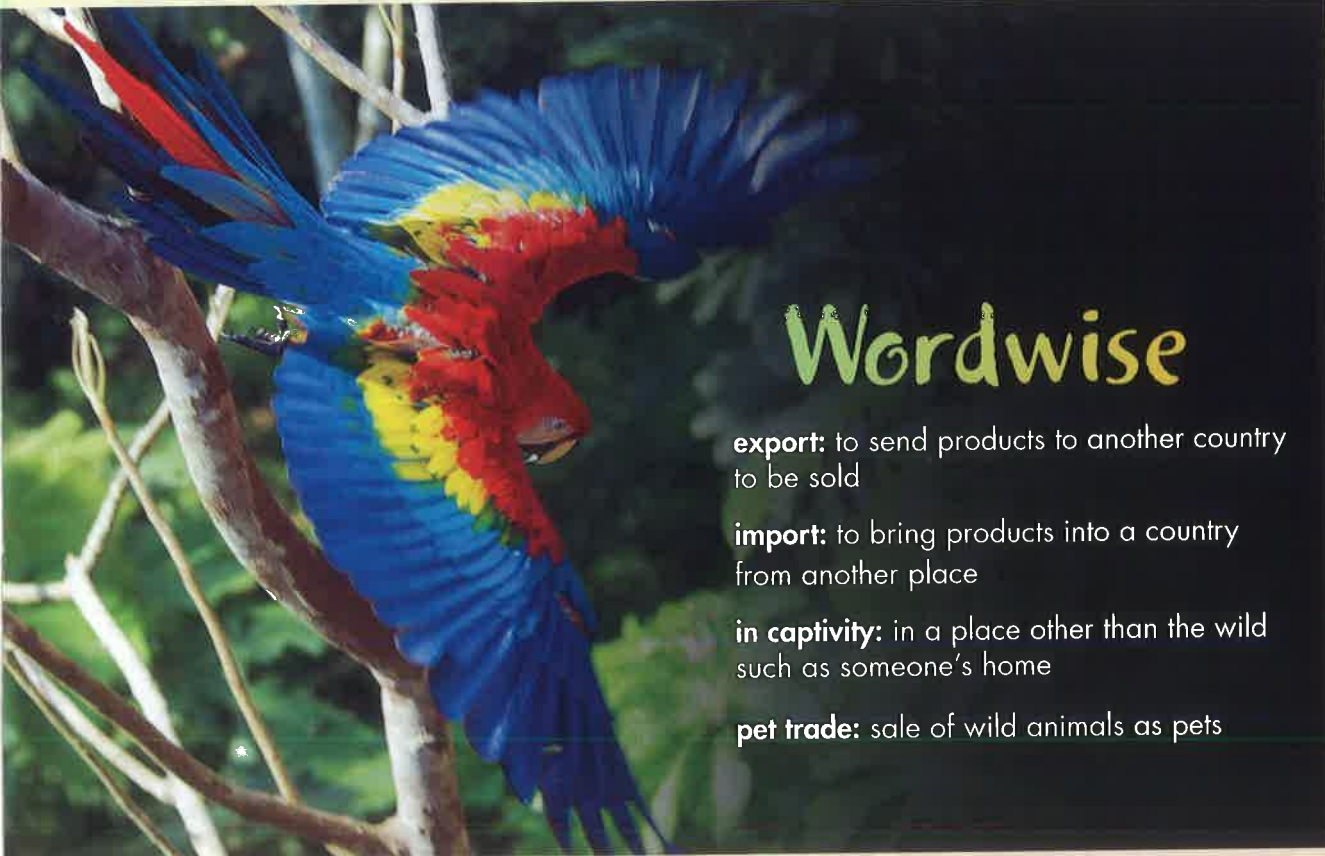
The future is looking brighter for wild parrots everywhere. Some parrots are even making a comeback. The small echo parakeet is a good example. Twenty years ago, there were only a dozen or so of these parrots left. Today, there are more than 300!

So you see, it's true. People working together can make a difference. That's why the cloth wall hangings are so special. They seem to say, "See our wild parrots? How beautiful they are!" Then you know. Wild parrots belong in the forest, flying free.



People in Peru sell these wall hangings to help protect wild parrots.

To learn more about parrots, visit www.ngpioneer.org



Wordwise

export: to send products to another country to be sold

import: to bring products into a country from another place

in captivity: in a place other than the wild such as someone's home

pet trade: sale of wild animals as pets

A macaw flies many miles a day to find food, clay, and other needs.



Reading Strategy: As you read this story, use the writer's words to picture what Earth's layers are like.



Volcanoes send smoke and ash into the sky in Indonesia.

ACTIVE EARTH



JOHN STANMEYER

BY BETH GEIGER

Earthquakes shake it. Volcanoes rock it. Earth is always on the move! Explore Earth's action from the inside out.

The JR bobbed in the ocean. The boat's drill dug into the ocean floor. It pounded into the hard rock. Scientists on the ship were excited. Could they drill deep enough? If so, they might discover new facts about Earth's story.

Cool Planet

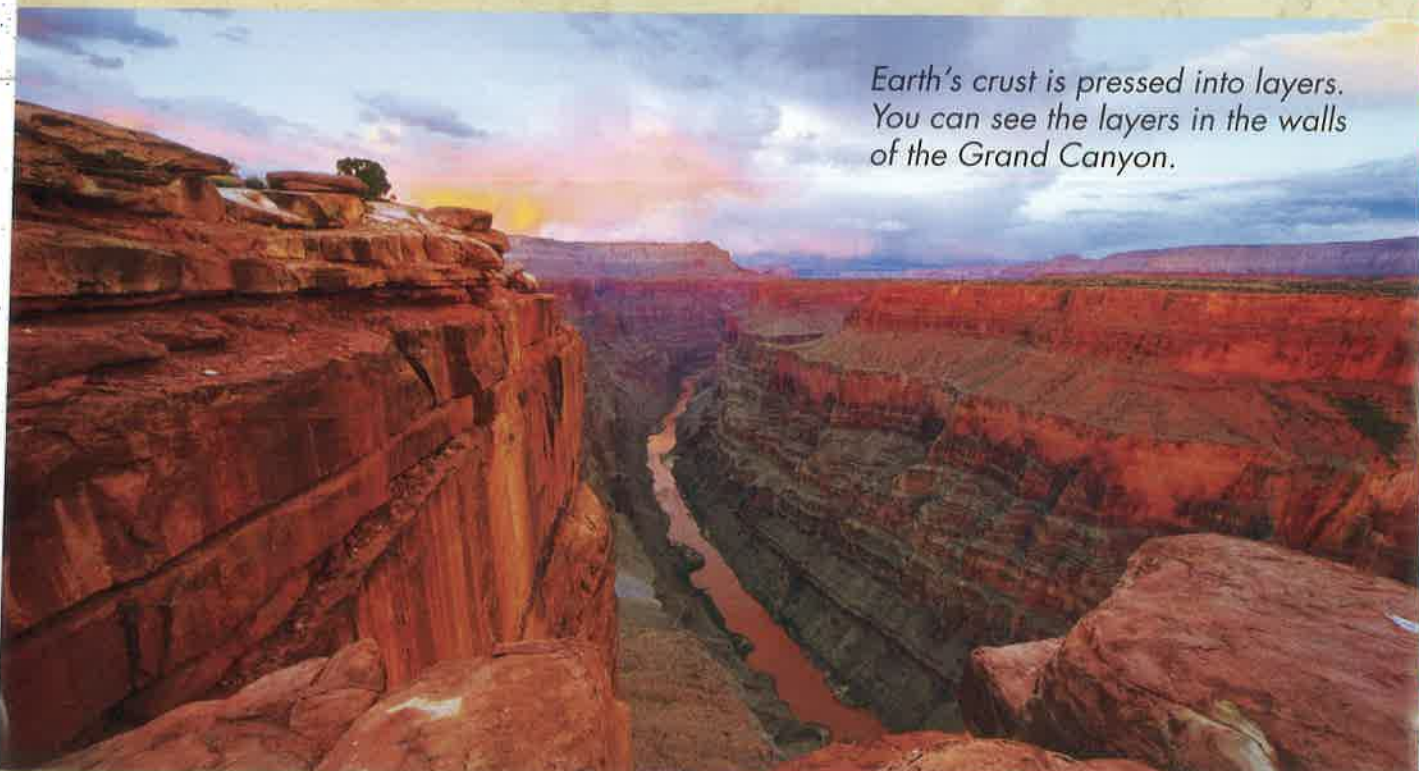
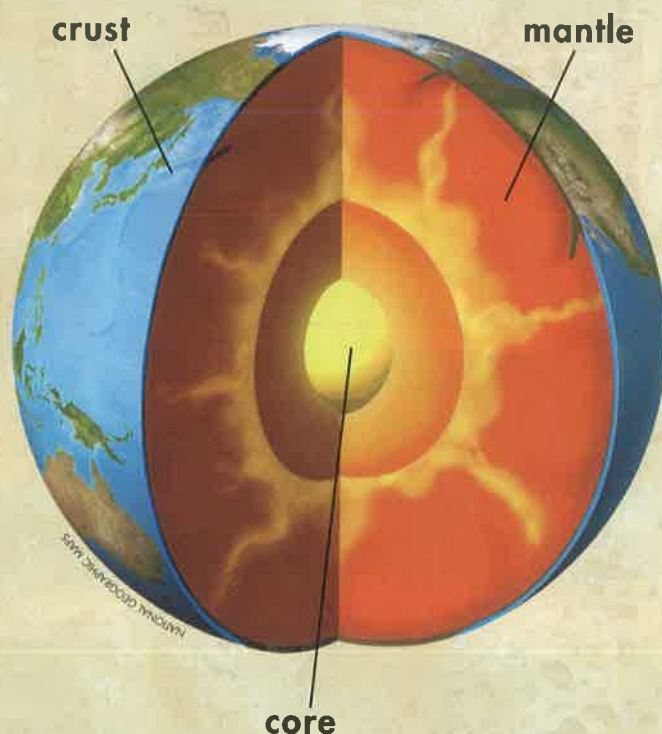
And what a long story it is. Earth is over 4.5 billion years old! At first, it was just a big blob of melted rock. Slowly, the planet cooled.

The heaviest things such as iron sank down. Lighter materials rose up. Over hundreds of millions of years, the materials formed three main layers.

No one has drilled to Earth's deepest layers. Not yet, at least. But scientists know what the layers are like. By studying earthquakes, they know some layers are made of liquid metal. Other layers are made of hard rock.

© ROMA/SHUTTERSTOCK (BACKGROUND)

EARTH'S LAYERS



Earth's crust is pressed into layers. You can see the layers in the walls of the Grand Canyon.

Core To Crust

To picture Earth, think of a boiled egg. Picture the yolk, egg white, and shell. Earth's "yolk" is called the core. It is the deepest layer. The core is very hot!

Next is Earth's thick mantle. It is like the white part of the egg. The mantle is made of partly melted rock.

Finally comes Earth's cool crust. It is like the eggshell—the thinnest layer. The crust is where we live. All you see is part of it. Valleys, fields, and even the oceans are part of the crust.

© DEDEDA/DESIGN PICS/CORBIS



Hot rock in Earth's crust heats this spring in New Zealand.

Giant Jigsaw

The crust may look solid. It's not. It is broken into huge pieces, like a jigsaw puzzle. The pieces are called **tectonic plates**. These plates float on top of the mantle. They are always moving. Here's what scientists think happens.

The hot core heats the mantle. That makes the partly melted rock rise up. When the rock moves away from the core, it cools. Then it sinks again. This push and pull from below makes the plates move.

Slow Going

The plates move very, very slowly. The fastest plate only moves about 15 centimeters (6 inches) per year. Yet those inches add up! Bit by bit, the plates pull continents apart.

Long ago, the continents were joined together. The first two maps below show how Earth once looked. The last map shows Earth today.

You can see it is always changing. In the future, Earth will look much different than it does now!

HOW THE CONTINENTS CHANGED



270 million years ago

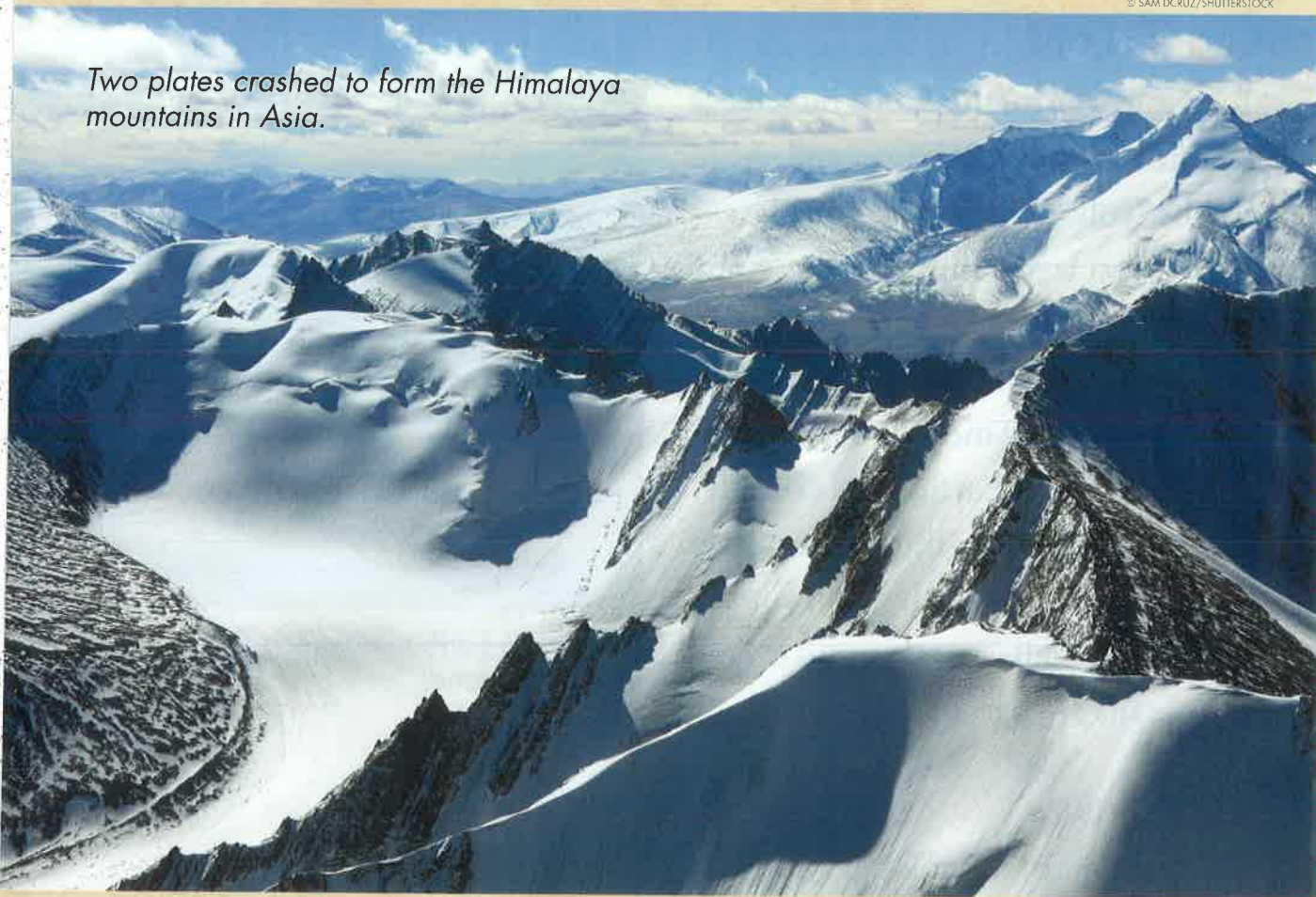


200 million years ago



present day

Two plates crashed to form the Himalaya mountains in Asia.



Collision!

Moving plates crash into each other. That means lots of action! Volcanoes, earthquakes, and even mountains are made by shifting plates.

Most of the action happens where plates meet. At a **convergent boundary**, plates crash into each other. Both plates push up. This can create huge mountains.

Sometimes an ocean plate bumps into a continental, or land, plate. Then the heavier ocean plate drops down. The deeper into Earth it goes, the hotter it gets.

Pull and Push

At a **divergent boundary**, two plates move apart. As they do, deep valleys form. Volcanoes erupt. Magma, or molten rock, oozes into the gap. In parts of Iceland, you can see the gap between plates.

At a **transform fault**, two plates slide past each other. That's what is happening in California.

Earthquakes shake the state as the Pacific plate creeps north. And Los Angeles is riding on top! In about 29 million years, the city will slide 350 miles north and pass San Francisco.

Ring of Fire

You can see lots of action along the Ring of Fire. That is along the edges of the Pacific plate. About 80 percent of Earth's earthquakes happen here. About 75 percent of active land volcanoes erupt here.

To see the Ring, look at a map of the Pacific Ocean. Volcanoes are all around it! On the east side, huge volcanoes rise up. Mount St. Helens is an example. You can find others in Washington as well as in California, Oregon, and Alaska.

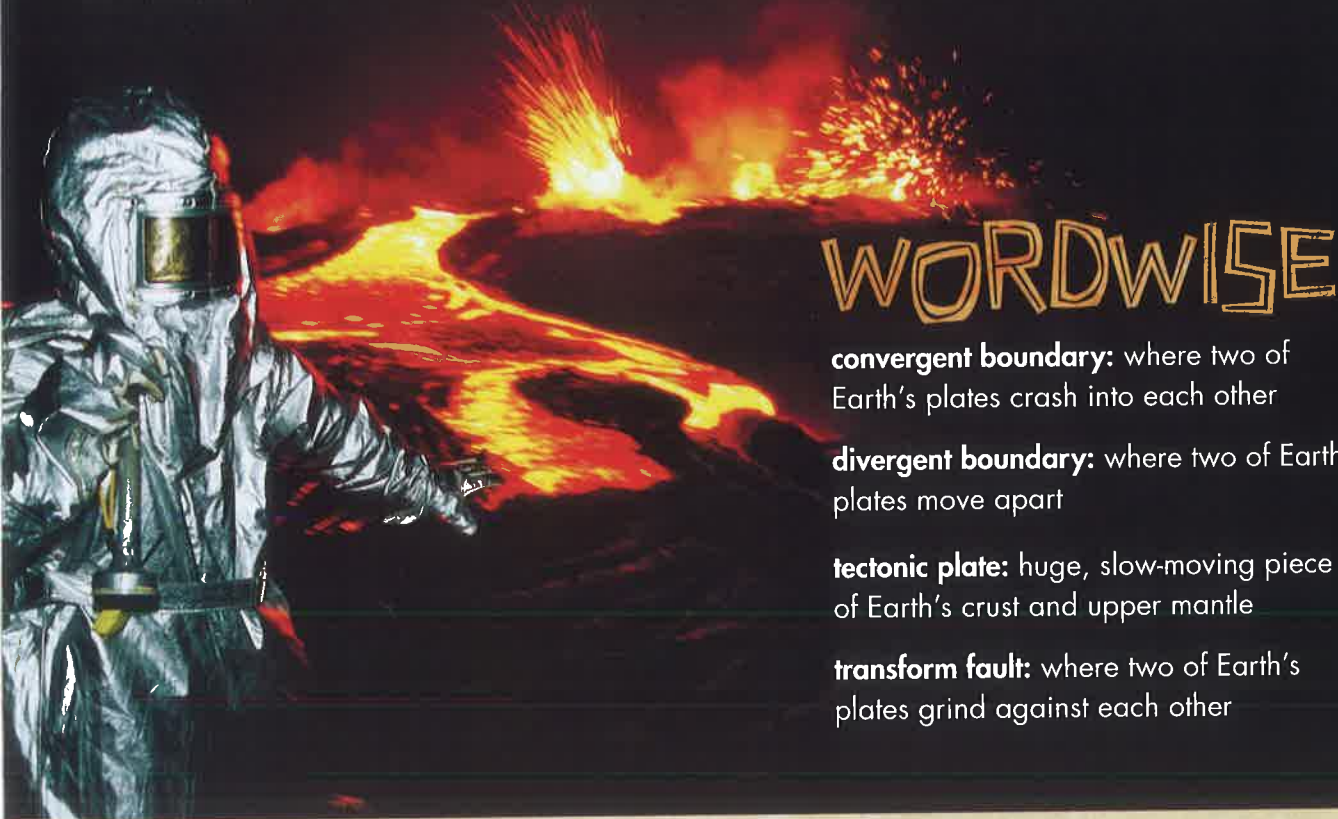
Into the Mantle?

We know how Earth's hot core shapes our home on the crust. But deep down, Earth still holds many secrets. That's why the scientists on *The JR* keep drilling down, down, down.

It may take 10 to 20 years before scientists reach the mantle. What an exciting moment that will be! What will mantle rock look like? What will it tell us about Earth?

Scientists may learn what's going on deep in our planet. Stay tuned for the next chapter in Earth's story.

Volcanoes can form when two plates split. They erupt through cracks in Earth's crust.



WORDWISE

convergent boundary: where two of Earth's plates crash into each other

divergent boundary: where two of Earth's plates move apart

tectonic plate: huge, slow-moving piece of Earth's crust and upper mantle

transform fault: where two of Earth's plates grind against each other



Reading Strategy: As you read this story, think about what you already know from what you have seen, heard, and read.



THE WINNING

To compete in the Winter Olympics, skier Billy Demong needs skill, strength—and science. BY GRETA GILBERT



© ANIK/SHUTTERSTOCK (BACKGROUND)

Billy Demong owns a very special machine. It can zoom down an icy runway. It can race over snowy fields. It can even fly. This machine just might win him an Olympic medal. What is this amazing machine? His body!

Demong is training his body to pass a great test. He competes in Nordic Combined. That mixes ski jumping and cross-country skiing. To pass the test, he will use science, too.

Powering the Machine

It's 6 a.m. Time for breakfast. Demong pulls out some milk and eggs. He puts three slices of bread in the toaster. Then he eats a bowl of cereal.

Each of these foods has a certain number of calories. A calorie tells how much energy a food gives. How much energy will this big breakfast give him? Will it be enough?

It's now 10 a.m. Demong is at the gym. He has already ridden his bike many, many miles. Long rides help him build endurance. That means he can exercise for a long time.

At the gym, Demong lifts weights. This makes his muscles stronger. As he exercises, his body breaks down his breakfast to create energy. The energy builds his muscles and fuels his workout.

Flight Plan

It's 1 p.m. Demong has done 30 leg lifts and 40 push-ups. He drank five glasses of water. He ate a huge sandwich. The extra calories gave him extra energy.

He is careful to eat only what he needs. He does not want to gain weight. A lean body will fly farther off the ski jump.

It's 6 p.m. He has skated with his teammates. He did 20 practice ski jumps. Yet he still is not done!

After dinner, he closes his eyes. He imagines the shape of his body moving. This will help him know how to hold his body on race day.

A small push gets Demong going. Then gravity pulls him down the ski jump.

The Machine in Motion

This February, Demong will be at the 2010 Winter Olympics. Thanks to a scientist named Sir Isaac Newton, he knows what he needs to do to win a gold medal.

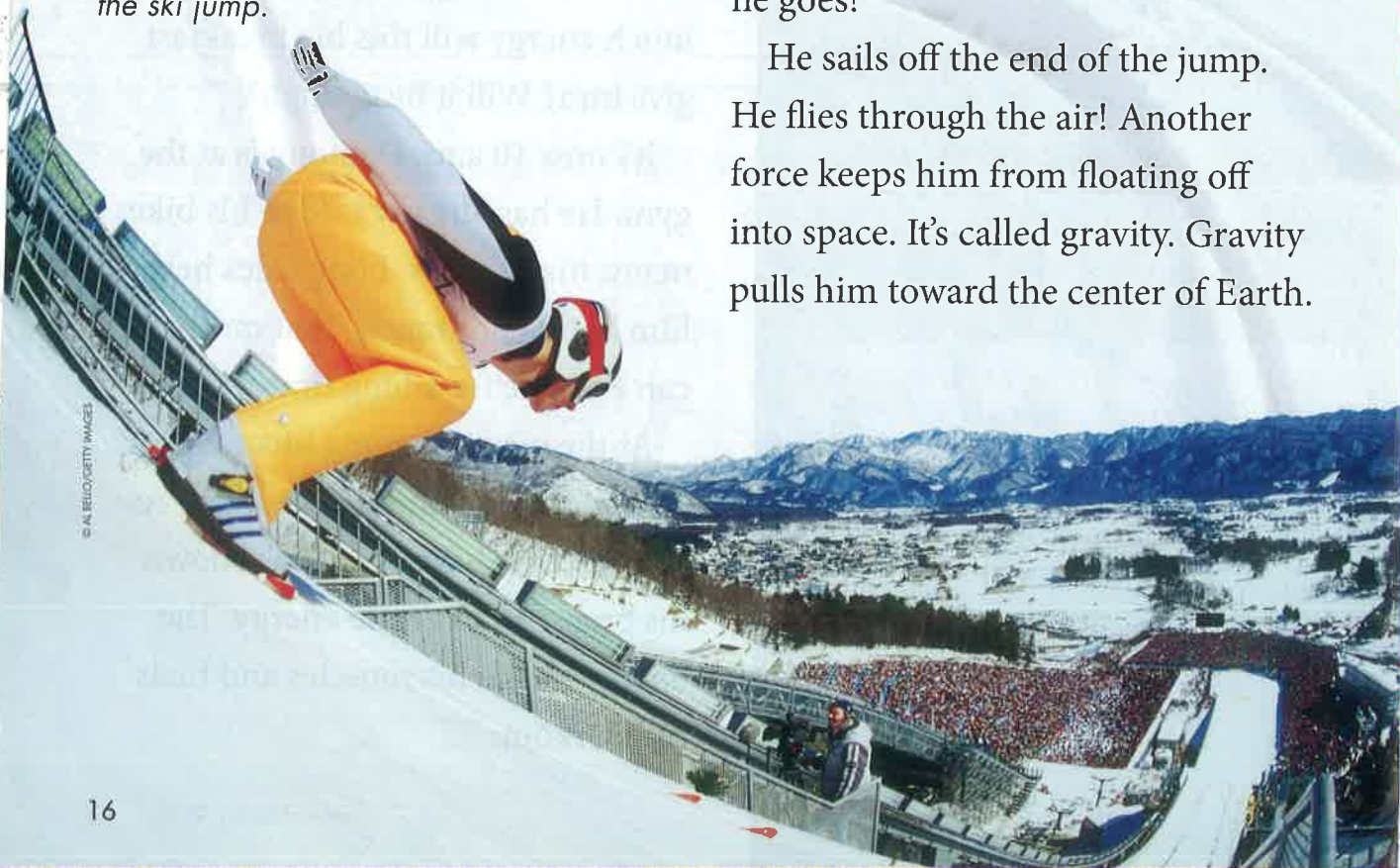
Hundreds of years ago, Newton explained three rules. These rules are called laws. The laws describe how all things move.

Law #1: Getting Going

Demong will use the first law to get going. This law says it takes a force to start moving. It takes a push or a pull.

To start a cross-country ski race, Demong pushes with his strong muscles. At the top of a ski jump, he only needs a tiny push. Down he goes!

He sails off the end of the jump. He flies through the air! Another force keeps him from floating off into space. It's called gravity. Gravity pulls him toward the center of Earth.



© AL BELL/GETTY IMAGES

Law #2: Gaining Speed

Demong loves the cross-country race, too. It takes force to speed across the finish line. How much does he need?

The second law says the more mass something has, the more force it needs to move. For example, a school bus has a lot of mass. So it needs a lot of force to move. Demong's mass is pretty low. Using a lot of force lets him zip past other skiers.

To go forward, Demong pushes his skies against the snow.



© BONNY MAKREWICZ/EPA/CORBIS

Law #3: Flying Far

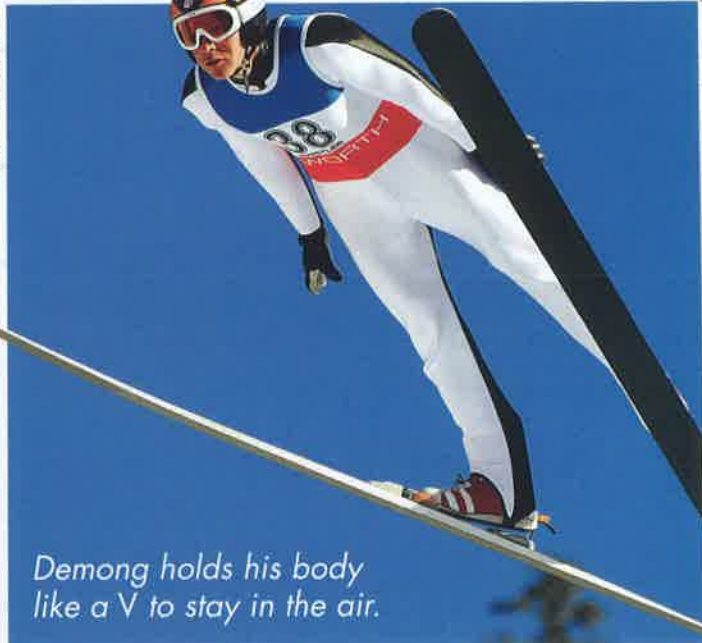
The third law says when an object pushes on something, the thing pushes back just as hard. Demong uses this law when he makes a jump. In the air, his body pushes air down. The air pushes back up.

The air pushing against him slows his fall back to Earth. He holds his body in a wide, V shape. That keeps him in the air longer.

In February, Demong will stand at the top of a ski jump. He will take a deep breath and push. Then gravity will take over. He will fly off. Seconds later, he will be on the ground.

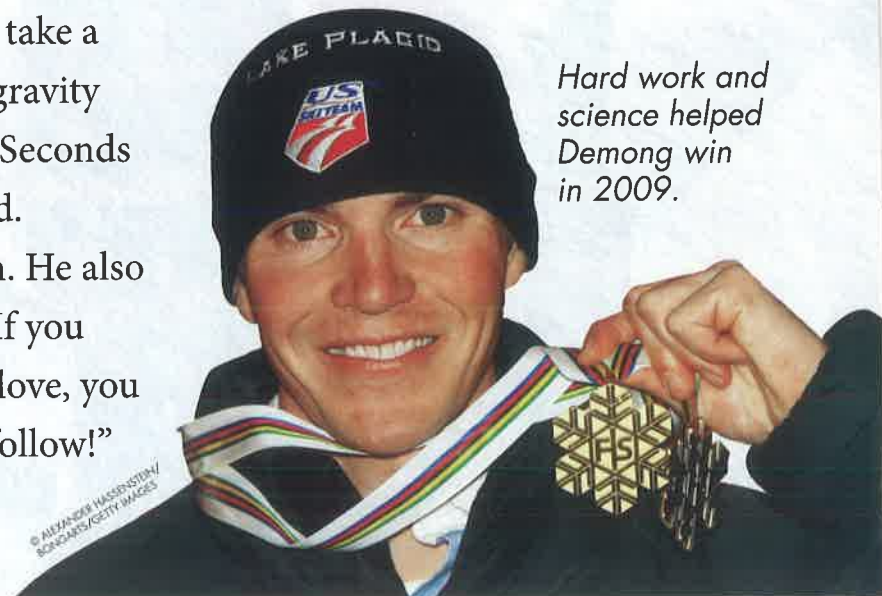
Demong would love to win. He also wants to have fun. He says, "If you work hard at something you love, you will have fun. The gold may follow!"

Demong holds his body like a V to stay in the air.



© HEIMUT FOHRINGER/EPA/CORBIS

Hard work and science helped Demong win in 2009.



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Reading Strategy: Read this story to find out how you can learn about your family's history.

Family

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