

Name: _____

Text Features

Use the article to help answer the following questions.

1. Find a word in the article "Quest for Quetzal" that's **bold**.
2. Write the **caption** on page 5.
3. What page is the **diagram** of photosynthesis on?
4. According to the diagram **what three things** enter the leaf?
5. What is the **title** of the article on page 18?
6. Find the **fact box** on page 17 and write the definition of oxygen?
7. What kind of **pictures** are on page 13.
 - a. Photographs
 - b. illustrations

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TRAILBLAZER

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1524, Guatemala

The Mayan ruler, Tecún Umán, was ready to fight. Spanish soldiers were invading. These men had already conquered Mexico. Now they wanted to rule the Mayan people.

Umán had no armor. On his head, he wore a crown of feathers. They came from a beautiful bird called the resplendent quetzal. At first, the enemy was no match for Umán's anger. But an enemy pierced his heart with a spear. He fell to the ground. A quetzal landed on his chest to protect him. Its chest feathers became stained red with Umán's blood.

Centuries later, the country of Guatemala named Tecún Umán a national hero for his bravery. They also named the quetzal as its national bird.



4 NATIONAL GEOGRAPHIC ENCYCLOPEDIA

A Stunning Bird

The battle is a part of history. But the quetzal's role is legend. The Mayan story explains how the bird came to have red feathers on its chest.

The quetzal's neck, back, and wings have a green metal sheen. On its head, golden-green feathers form a spiky crest. The males have two long tail feathers. They help the bird find a mating partner.

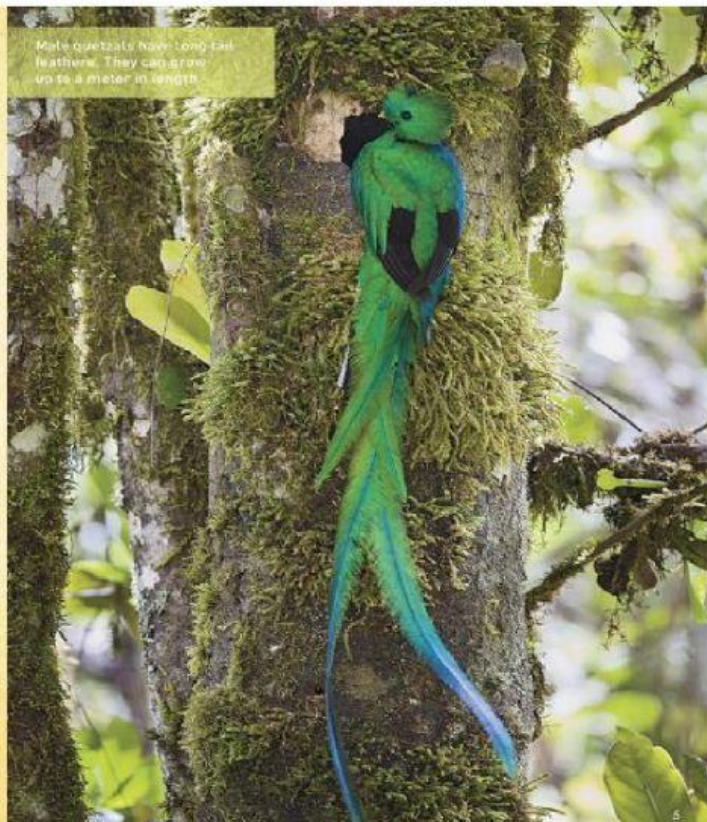
Quetzals live throughout Central America—from southern Mexico to Panama. They are mostly found in high cloud forests and on mountain ranges. There, it is misty and cool.

The birds lay their eggs in holes of rotting trees. Both parents take turns keeping them warm. When the eggs hatch, the parents feed their chicks.

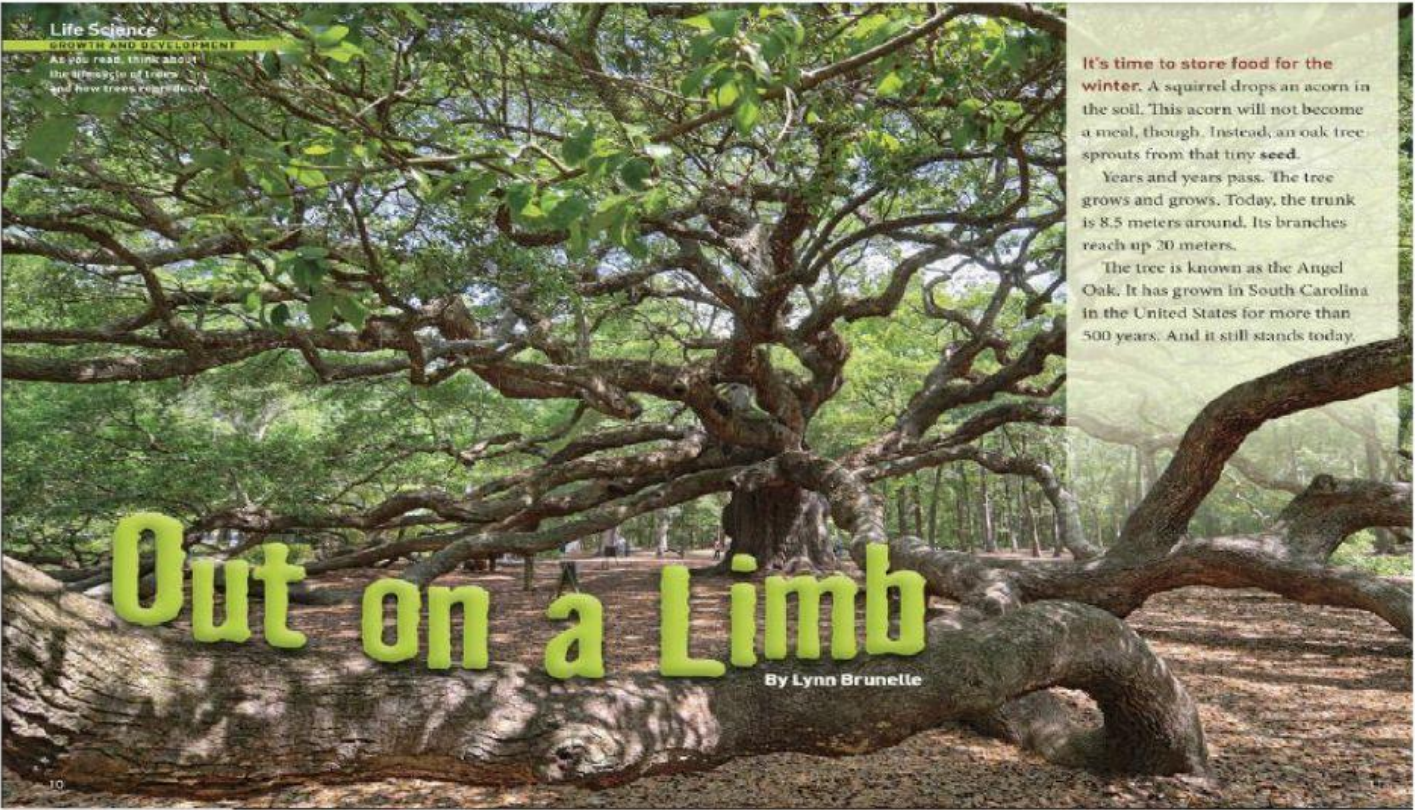
Quetzals are cautious birds. When danger is near, a quetzal will turn its body. It will hide its red chest from predators.

This quetzal rests on a mossy branch.

Male quetzals have long tail feathers. They can grow up to a meter in length.



5



Life Science

GROWTH AND DEVELOPMENT

As you read, think about
the structure of trees
and how trees reproduce.

Out on a Limb

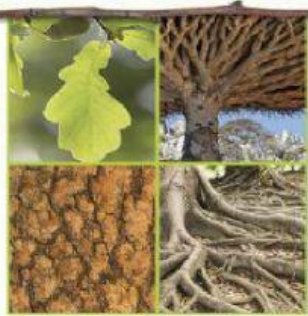
By Lynn Brunelle

It's time to store food for the winter. A squirrel drops an acorn in the soil. This acorn will not become a meal, though. Instead, an oak tree sprouts from that tiny **seed**.

Years and years pass. The tree grows and grows. Today, the trunk is 8.5 meters around. Its branches reach up 20 meters.

The tree is known as the Angel Oak. It has grown in South Carolina in the United States for more than 500 years. And it still stands today.

There are more than 40,000 kinds of trees in the world. All trees have the same parts. **Roots** pull up water from the soil. **Leaves** make food from the sun. **Bark** protects trees from harm. **Branches** and **trunks** support trees.



Circle of Life

Like all living things, trees have a life cycle. One kind of tree, an evergreen, has leaves shaped like green needles. Instead of flowers, evergreens have cones. Male cones make pollen. Wind carries the pollen to female cones where seeds are produced.

When the seeds fall to the ground, they sprout and grow into seedlings. Seedlings grow into trees. The trees make cones. The cycle begins again.

Life After Death

When a tree dies, nothing is wasted. If it falls, it opens up space for sunlight. The sunlight helps seeds sprout and take root in the ground.

Some trees sprout on the trunks of fallen trees. These fallen trees are called "nurse logs." They provide nourishment as they rot.



A nurse log helps bring new life to the forest.

This evergreen is a bristlecone pine. It's almost 5,000 years old. It looks dead but is still alive.



Evergreens produce cones, such as this one.

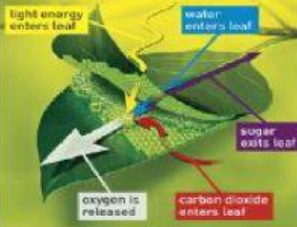


Solar Power

Trees and other plants make their own food from sunlight. The process is called **photosynthesis**. *Photo* is a Greek word that means "light." *Synthesis* is a Greek word that means "putting things together."

PHOTOSYNTHESIS

A leaf turns sunlight, water, and carbon dioxide into food and oxygen.



Food Factories

Plants are food factories. They need sunlight, water, and **carbon dioxide** to make food. Carbon dioxide is a gas. It is in the air we breathe out. Plants take it in. They combine it with sunlight and water to make sugars and another gas called **oxygen**. The sugars feed the tree.

This happens every day. Every leaf soaks up the sunlight and makes food for a tree. Every leaf also puts oxygen into the air. Without plants, animals would have no food to eat or air to breathe.

Growing Up and Out

As a tree grows, it gets taller and wider. Branches reach up so leaves can soak in sunlight. Roots reach out to pull in water and nutrients from the soil.

A tree's growth shows up as a ring inside the trunk. Every year a tree gets wider as it adds another ring to its trunk.

A tree's age is reflected in the number of rings it has.

Family Tree

From the tallest giant redwood to the widest cypress, here's a snapshot of some of the biggest, tallest, and widest trees.

WIDEST

El Arbol del Tule

Cypress tree in the Mexican state of Oaxaca

—El Arbol del Tule is believed to have the widest tree trunk in the world, with a diameter of 11.6 meters. That's wider than a tennis court.

BIGGEST

General Sherman

Giant sequoia in California

—Among the biggest trees are the giant sequoias. General Sherman is 83.8 meters tall and 11.1 meters in diameter. That's pretty big.

TALLEST

Unnamed redwood

California

—Among the tallest trees are the redwoods. The world's tallest redwood is believed to be about 116 meters tall. That's taller than the Statue of Liberty in New York City.



rainbow eucalyptus, Indonesia

Not All Alike

All trees have bark, roots, and trunks. But they are not all alike.



mangrove trees, tropical oceans



baobab trees, Africa

Rainbow Bark

A tree's bark protects it. It can be dark and craggy or pale and papery. The rainbow eucalyptus's bark looks like someone painted it with a brush.

Brown bark peels away to show shades of bright green. The sun and the air turn the green bark purple. Then it turns blue, orange, red, and yellow. It turns brown just before it sheds again. These bright colors may be a good defense. They send signals to insects and other animals that the tree is poisonous.

Snorkel Roots

Salty tides rise and cover the roots of mangroves. These trees live along the shore. They are tough. They stand tall. Their roots help them live where most plants can not.

Saltwater kills many trees. The roots of the mangrove filter out the salt in the water. They arch high over the water and dig deep into the soil. Tall, thin tubes grow straight up from the roots and reach above the ocean tides. They act as snorkels to get air and cope with daily flooding.

Trunk Tanks

Sometimes it doesn't rain on the African plains. Yet the baobab tree is green. Its trunk allows it to store huge amounts of water. Baobab trees can survive a long time without rain.

The baobab, mangrove, and rainbow eucalyptus are three of many types of trees around the world. Trees are amazing. They make their own food. They produce oxygen for us to breathe. They have been on this planet a long time. Our world wouldn't be the same without them.

WORDWISE

carbon dioxide: a gas, made up of carbon and oxygen, that is present in the air

leaf: the main part of a plant needed for photosynthesis

oxygen: a gas in the air that humans and animals need to breathe

photosynthesis: the process of plants using sunlight to make their own food

root: the part of a plant that attaches it to the ground and draws water and nutrients from the soil

seed: a part of a plant from which a new plant can grow



Signs of Life?

I went to western Africa to look for new species of fish. To find them, I had to battle dense jungle, bad weather, and a whole lot of blood-sucking leeches.

Text and photos
by Joe Cutler,
National Geographic Young Explorer