EXPLORE THE FOREST

Discover Oregon's natural world

Oregon Forest Resources Institute

Step into the forest

Towering trees cast long shadows. Wind rustles through branches. Birds chatter overhead. The smell of fir trees and wet moss fills the air. Ferns and mushrooms sprout from logs. A carpet of leaves softens the sound of footsteps.

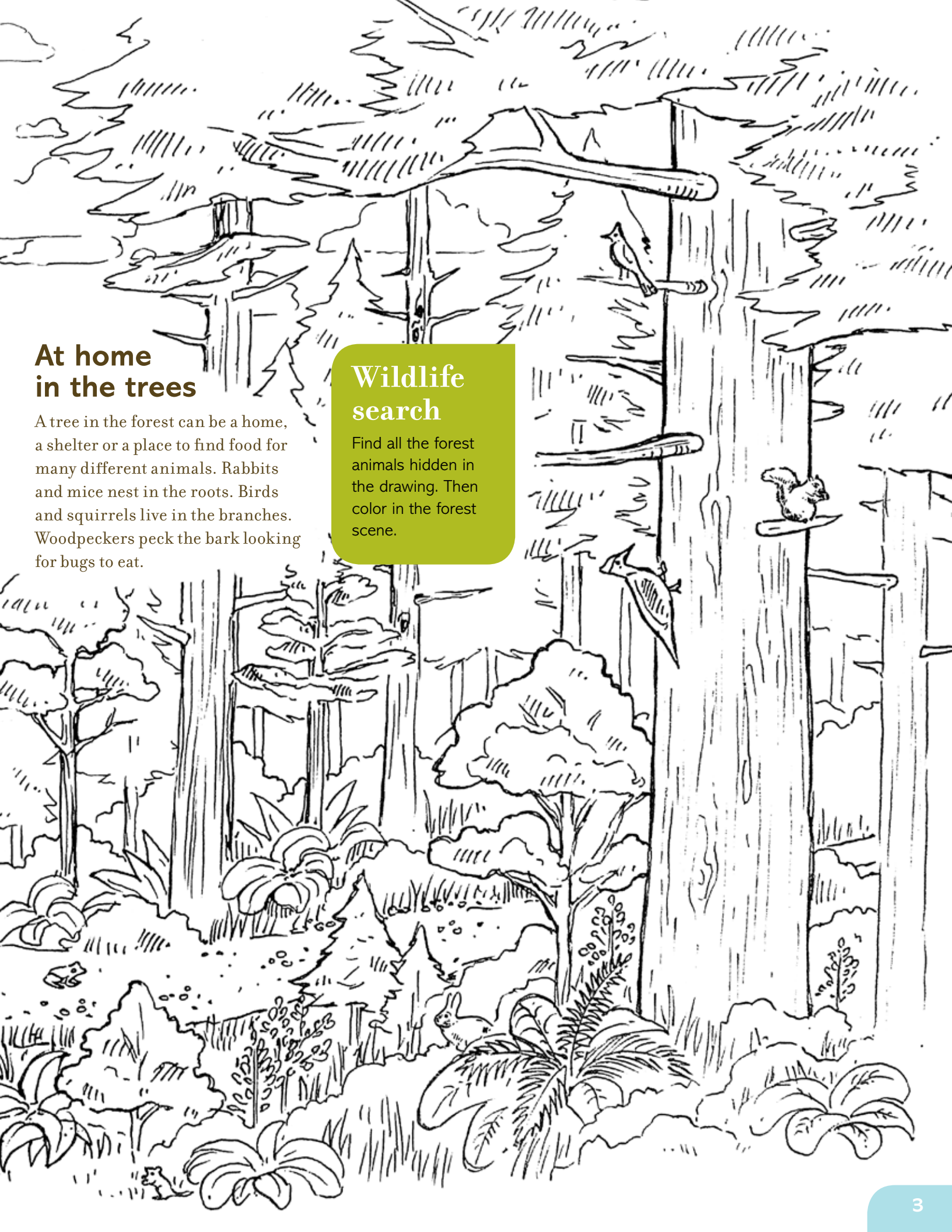
A forest is a wonderful place to explore. And it's much more than a bunch of trees.

Step inside and you'll discover lots of different plants and animals living there. Come explore this natural world and find out why forests are so important to lots of creatures – from the tiniest insect to you.

What is a forest?

A forest is an area with lots of trees. It's also a place where many different plants and animals live.

Not all forests are the same. Some forests have mostly one kind of tree. Other forests have a mix of different tree types.



At home in the trees

A tree in the forest can be a home, a shelter or a place to find food for many different animals. Rabbits and mice nest in the roots. Birds and squirrels live in the branches. Woodpeckers peck the bark looking for bugs to eat.

Wildlife search

Find all the forest animals hidden in the drawing. Then color in the forest scene.

Forests are full of life. Each forest has a wide variety of plants. Living among those plants are lots of different animals. This is...

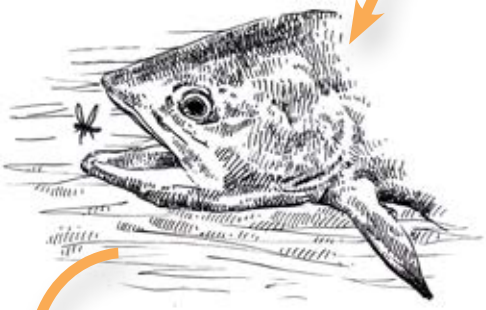
the forest community

All forest **organisms** need energy to live and grow. Food energy is transferred between them through **food chains**.

For example, plants use energy from the sun to make their own food through **photosynthesis**...

insects eat plants...

insects are then eaten by animals, such as fish...

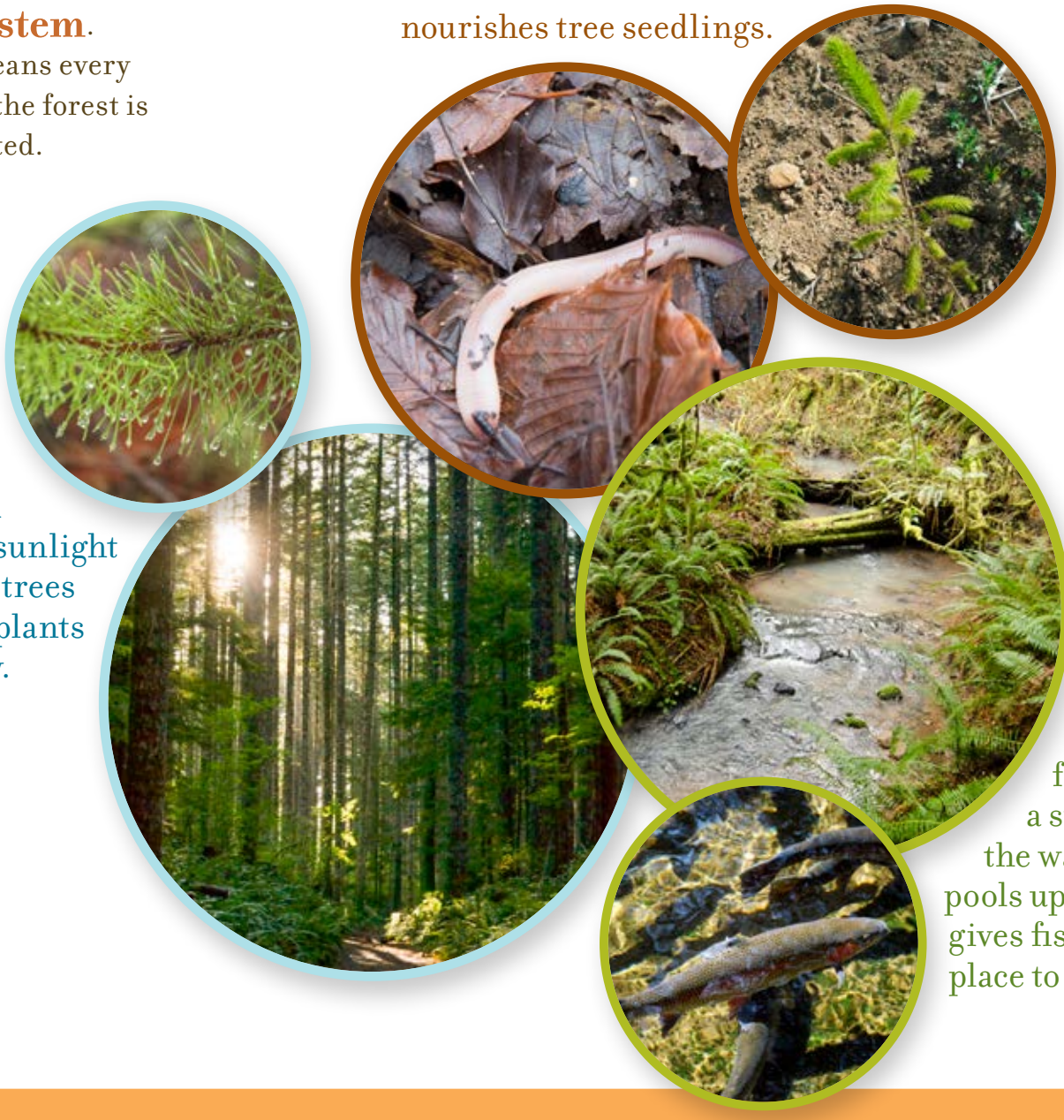


which are hunted by other animals, such as river otters.

These forest food chains are also linked together, forming a **food web**.

We can also describe a forest as an **ecosystem**. This means every part of the forest is connected.

Worms help turn dead leaves on the forest floor into soil that nourishes tree seedlings.



Rain and sunlight help trees and plants grow.

When a tree falls into a stream, the water pools up. This gives fish a safer place to live.

WORDS TO KNOW:

ecosystem

All the living and non-living things in an area. The forest ecosystem includes the plants, animals, water, sunlight and soil.

food chain

Who eats what in an ecosystem. For example, plants are eaten by deer, which are eaten by cougars.

food web

All the food chains in an ecosystem linked together.

organism

A living plant or animal.

photosynthesis

The way trees and other plants use energy from the sun to make food.

Life as a tree

A tree is a tall plant with a single, woody stem. The two main types of trees are broadleaf trees and conifers. **Broadleaf** trees have wide, flat leaves. **Conifers** have narrow leaves that look like needles or scales.

Leaves and needles

Broadleaf trees have leaves that change color and drop off each autumn. Shedding all its leaves in the autumn allows the tree to "hibernate" during the winter. When the sun shines more in the spring, the tree grows new leaves.

Parts of a tree

FLOWERS produce fruits, nuts and cones, which contain seeds to grow new trees.

LEAVES are like miniature power stations. They take in energy from the sun and turn it into fuel for the tree to grow.

Spreading seeds

Since trees can't move, they need help from animals or the wind to spread their seeds.

The seeds of **broadleaf** trees are inside fruits or nuts. Birds and other animals eat the fruits and scatter the seeds in their droppings. Squirrels bury the nuts to save for later. They don't always remember all of them, and some grow into new trees.

Conifer tree

WORDS TO KNOW:

broadleaf trees
Trees with wide, flat leaves that change color, drop off each autumn and are regrown in the spring.

conifer trees
Trees with seeds that grow in cones and narrow leaves that look like needles or scales. Most have leaves that stay green all year.

evergreens
Trees with leaves that stay green throughout the year.

Forests that grow in places with cold, wet winters often have lots of **conifer** trees. A conifer's needles are smooth and flexible so snow slides off easily. This helps prevent the tree's branches from getting weighed down by snow and breaking.

The needles on conifers stay green all year and don't drop off in the fall. That's why conifers are also sometimes called **evergreens**.

The **TRUNK** of the tree supports the branches, which hold leaves, flowers, fruit or cones.

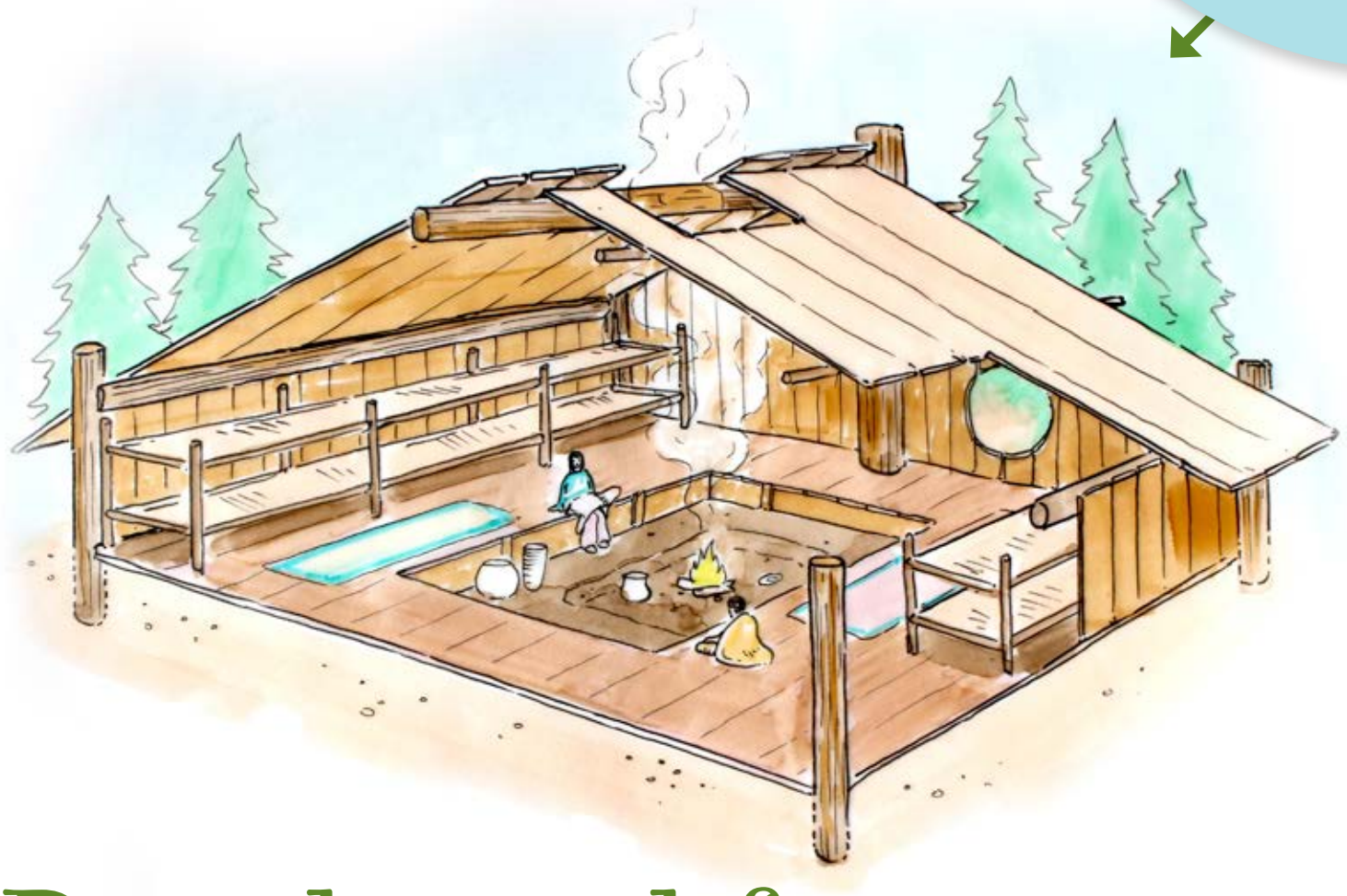
The **ROOTS** anchor the tree. They also suck up water and nutrients from the soil.

Most **conifer** trees have scaly cones that protect their seeds. When the seeds are ready to grow, the scales on the cone open. The tiny seeds then fly in the wind on papery wings.

Growing a new tree

Each of the big, tall trees you find in a forest once started out as a small seed.

Seeds that get enough sunlight, water and nutrients crack open. The roots then break through and a tiny stem appears. The stem pushes through the ground, the first leaves unfold, and a seedling is born.



Historic wooden plank house

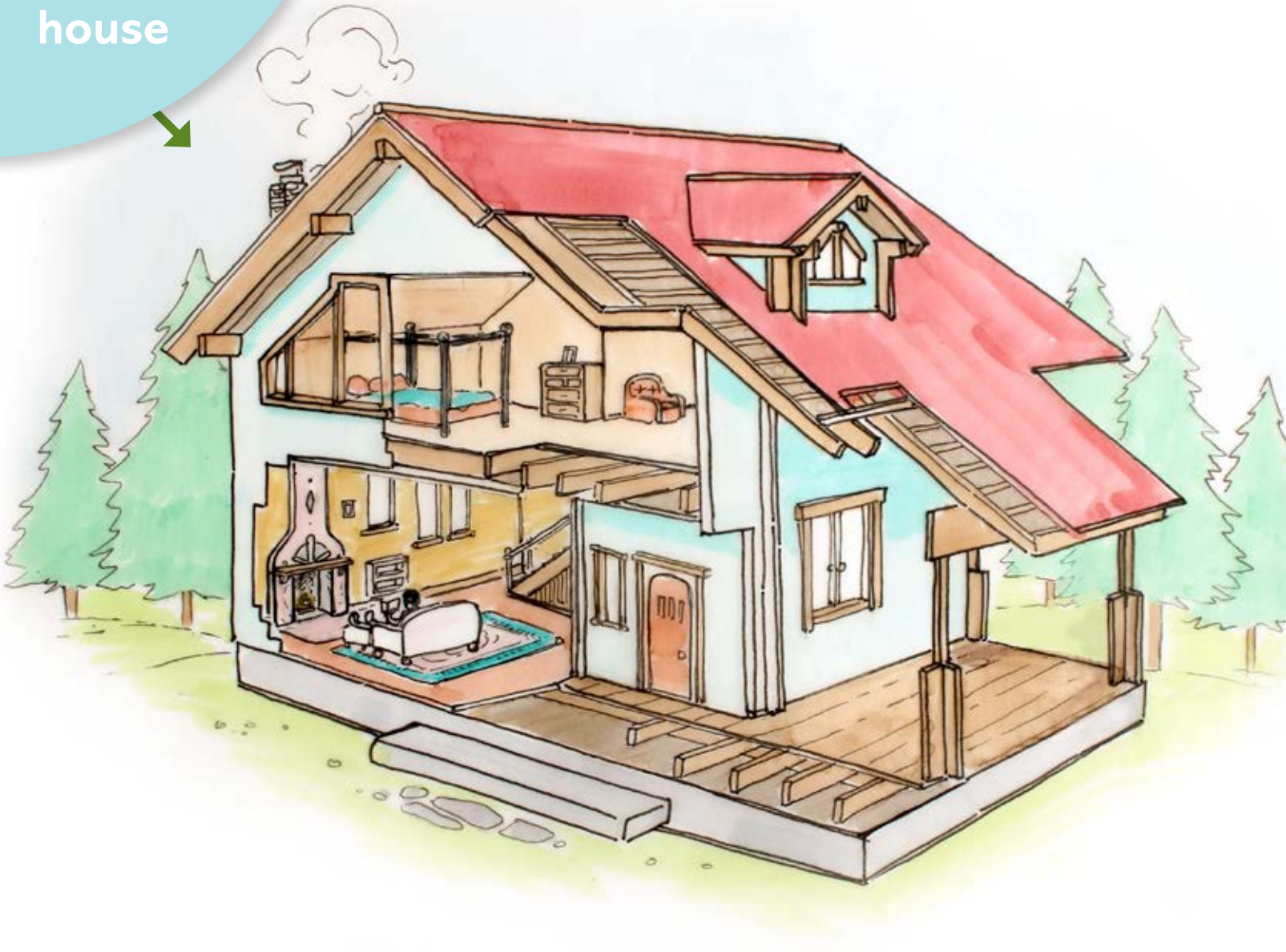
People and forests

Forests are an important part of our lives. The clean water you drink likely started out in a forest stream. If your house is made from wood, it came from the forest. Trees release oxygen, providing fresh air for us to breathe. The shade of a tall tree can help you cool off on a hot day.

People have long used the forest for food, wood and other things. Oregon's first residents hunted, fished, and gathered roots and berries in the forest. Native Americans burned wood to stay warm and cook food. Some used wood from cedar trees to build homes called plank houses. They also carved wooden canoes, sculptures and musical instruments.

Today, people hunt, fish and gather food in the forest. We build our homes with wood. We enjoy keeping warm by a fire. People also hike, camp and play in forests.

Modern wooden house



Wood search

Look at the pictures of the two houses and find four things in each made from trees.

HISTORIC WOODEN PLANK HOUSE	MODERN WOODEN HOUSE

Oregon: A great place

to grow trees

Some parts of the world are too hot and dry for trees to grow. But in Oregon, trees get just the right amount of rain, sunlight and nutrients from the soil to grow in large numbers. The result is a forest.

Forests cover almost half of all Oregon land. And no two forests are exactly alike. The kinds of trees that grow in any forest depends on such things as the soil, **climate** and **elevation**.

Ponderosa pine

trees grow mostly in dry areas. They thrive in places with dry summers and cold, snowy winters.

WORDS TO KNOW:

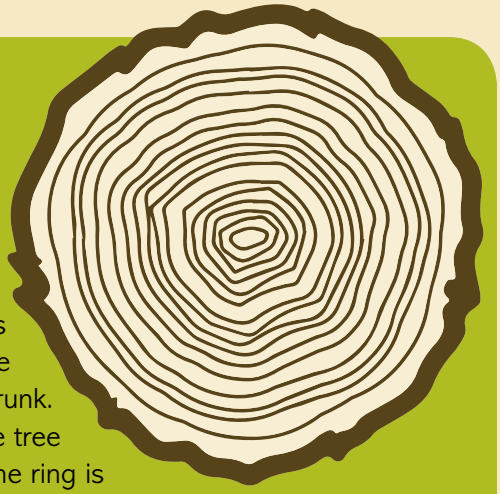
climate

The usual weather in a place.

elevation

The height above sea level.

How old is this tree?



Count the rings to find out. You can count the rings in a tree stump to learn the tree's age. This is because each year the tree grows a new layer on its trunk. A wide ring shows that the tree grew quickly that year. If the ring is narrower, the tree grew slowly.

Settling in Oregon

In the mid-1800s, a lot of people moved to Oregon. Many thousands of people traveled a long way over the Oregon Trail. They hoped to start a new life in Oregon.

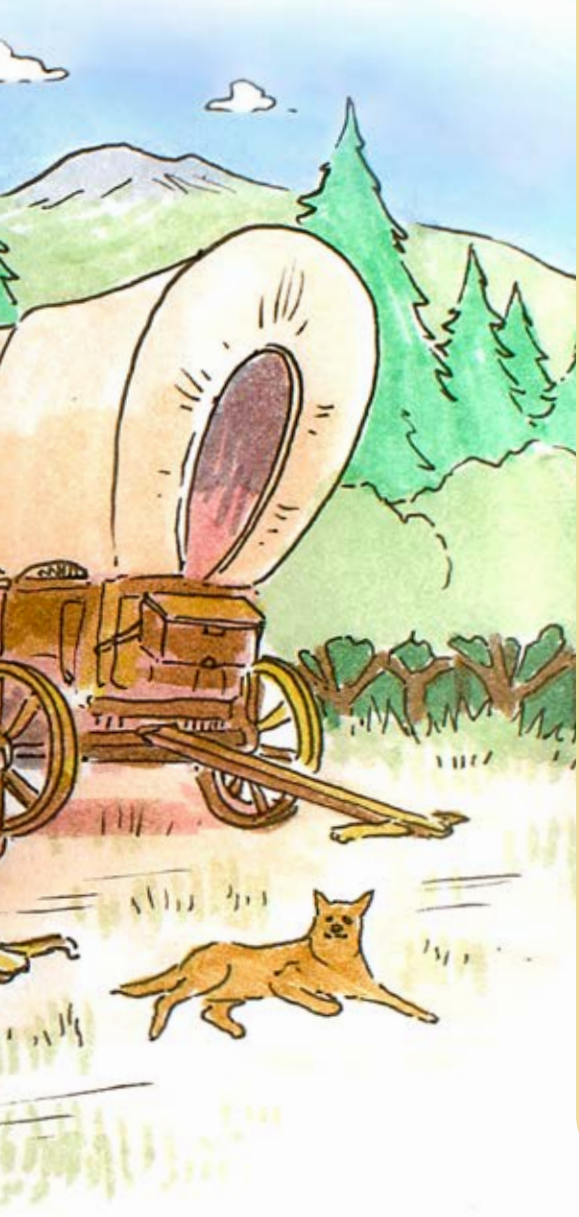
Many were attracted to Oregon's natural bounty. They found good soil for growing fruits and vegetables. The forests were tall and thick. There were grassy plains for cattle and sheep to graze.

Today, people are still moving to Oregon. Many appreciate the natural beauty of the state. Our forests are great places to work and play.

The state tree

The Douglas-fir is Oregon's state tree. It is the second-tallest type of conifer in the world.

Douglas-fir trees provide some of the best wood in the entire world for building homes, apartments and offices.



The mouse, the Douglas-fir and the great forest fire

Adapted from a well-known local legend

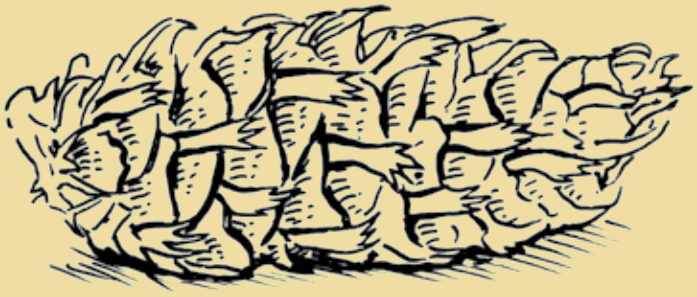
A long time ago, when animals and plants could speak to each other, there was a great forest fire. Little Mouse ran as fast as he could to get away from the hot fire, but he knew he couldn't outrun the fast flames. He began to run from tree to tree asking each if they could save him.

First he ran to the maple tree. "Help, help!" he cried. "Can you help me escape this fire?" The maple tree replied, "No, I'm sorry, I'm afraid I won't survive this fire." So Little Mouse ran to other trees, but got the same answer.

Finally, he came to a great old Douglas-fir tree. When Little Mouse asked if the Douglas-fir could help save him from the fire, the tree replied, "Yes, I think my thick bark will protect me from the heat of these flames. Climb under the scales of one of my cones for extra protection."

Little Mouse did as he was told, and many other mice followed him and did the same. And the Douglas-fir was right. Its thick bark helped the tree and the mice survive the fire.

To this day, if you look under the scales of a Douglas-fir cone there are still little mice feet and tails poking out. Can you see them too?



Putting forests to work

As people moved to Oregon, they set up logging camps and sawmills. These provided wood for building houses, barns and wagons, and fuel for cooking and heating homes. The mills created a lot of jobs. Oregon's towns and cities grew as people came to work in the forest.

Turning trees into timber was a lot of work. Loggers cut down trees with axes. Then the logs had to be sawed by hand. Today, machines do almost all the work.

Many Oregonians work in the forest. There are lots of different forest jobs, such as firefighters, loggers and wildlife biologists.

Scientists also work in the forest. They do research to find better ways to protect and care for trees, plants, fish and other forest animals.

Old-time tools

Modern tools

Forest tool match-up

For each forest job below, draw lines to the old-time tool and the modern forest tool.

cutting trees

moving logs

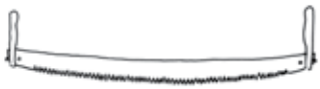
finding direction

communicating

recording notes

fighting fires

safety

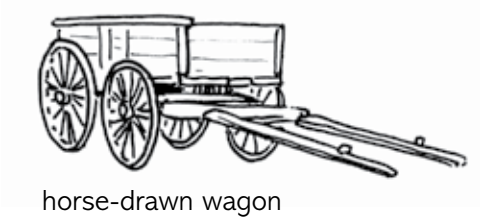

crosscut saw


compass


pen and paper


crank telephone


hard hat


horse-drawn wagon


water pail

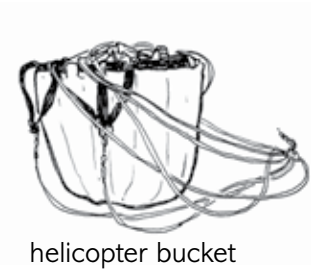

logger helmet


log truck


GPS device


electronic tablet


walkie-talkie


helicopter bucket


logging machine

Working in the forest

There are many different forest careers. Here are some examples.

Logger

Loggers cut down trees to make wood products.

It's a lot of hard work with heavy machinery. You have to love being outdoors.

Firefighter

Firefighters work in crews to fight forest fires.

Fighting wildfires is challenging, but rewarding. It's a good job for someone who likes to travel. Every day is an adventure.

Forester

A field forester helps replant trees after a forest is logged.

Field foresters spend most of their days in the forest. They make sure seedlings are planted correctly. They also check that the young trees are healthy.

Wildlife biologist

Wildlife biologists make sure forests are good homes for animals.

They help care for all the creatures that live in the forest.

Forest jobs

Which of these careers would you like to have, and why?

Mill worker

Mill workers cut logs into lumber for construction.

Mills use technology to create wooden boards. These boards are used to build homes, apartments and offices.

Park ranger

Park rangers take care of forests where people hike and camp.

Rangers make forests better for people and animals. They help build new trails and improve streams for fish.

Fires and forests

After a wildfire, the blackened trees make it look like the forest is dead, but it's not! Take a closer look and you'll find that a newly burned forest is filled with life.

Shortly after a fire, the forest begins to recover. Wildflowers bloom. Berry plants thrive. New trees sprout. Birds and insects are attracted to the fresh berries and blooming flowers. Deer and elk eat plants growing in the meadows created after a forest fire.

An occasional wildfire can end up helping some trees, plants and animals that live in Oregon forests. Here are some examples:

ELK find plenty of shrubs and berries to eat in burned forests where the plants have started to grow back.

HUCKLEBERRY bushes need lots of sunlight to grow. Fires create openings in the forest, giving the berries the sunshine they need.

WOODPECKERS visit forests after a fire because food is plentiful there. The burned trees in forests are full of insects that are a primary food source for woodpeckers.

Some **LODGEPOLE PINE** trees have seed cones that open only after a fire. A natural glue called resin holds the cones closed until it is melted by fire. After the resin melts, the scales of the cone curl open and the seeds are released.

Preventing wildfires

Although wildfire is part of the natural forest cycle, we can't just let fires burn out of control. This is because wildfires can spread quickly beyond the forest, putting people in danger and destroying homes.

Lightning starts some fires, but careless people cause most wildfires. These human-caused fires don't have to happen. Here are some ways you can help prevent wildfires:

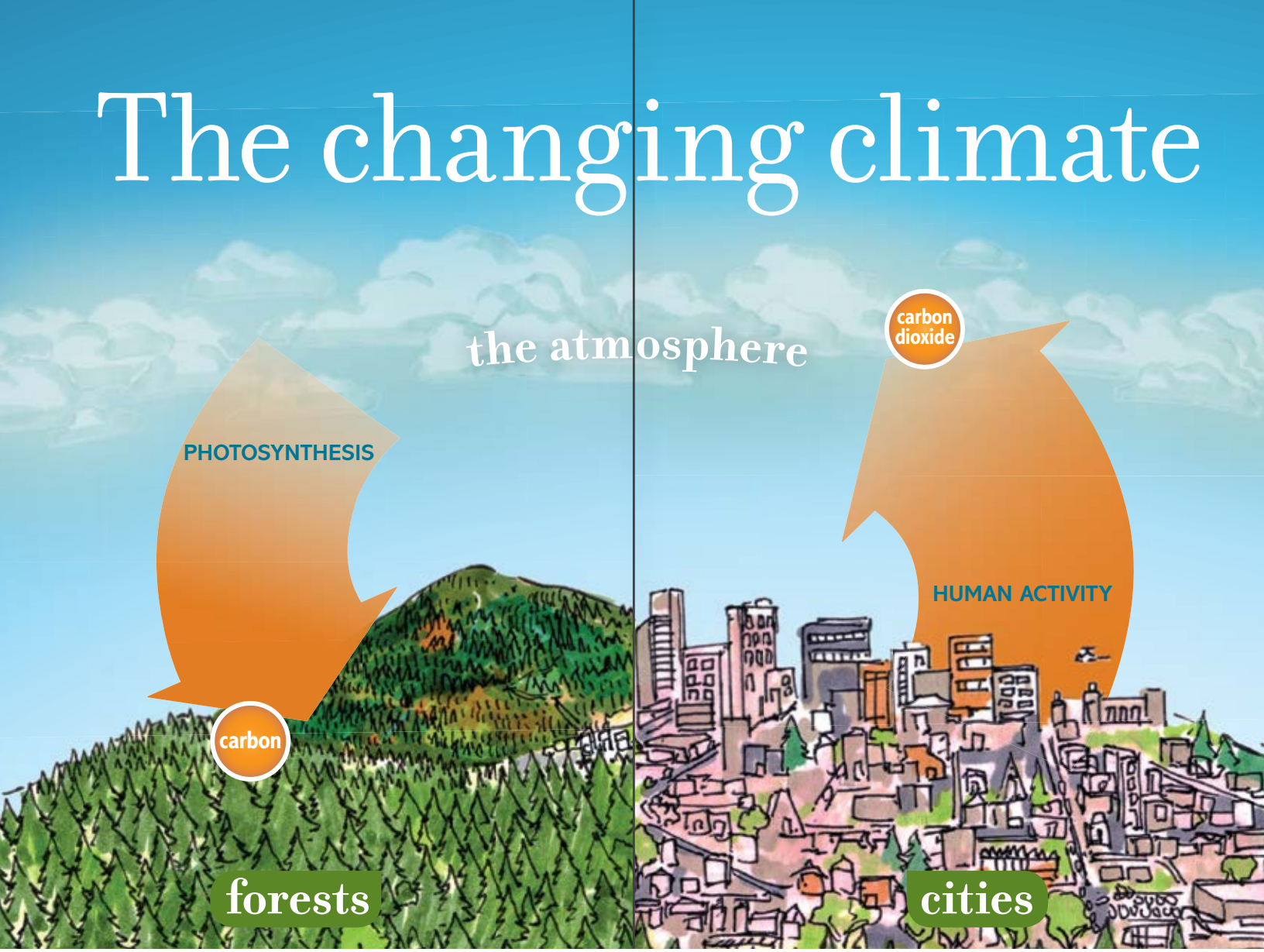
- Never play with matches or lighters.
- Don't leave a campfire burning when no one is there to watch it. Even a small breeze could cause the fire to spread.
- When you are done with a campfire, put it out completely. Drown the fire with water and stir it with a shovel until it is dead out.

Source: Keep Oregon Green Association

Find the signs

What clues do you see that this forest is still alive after being burned?

The changing climate



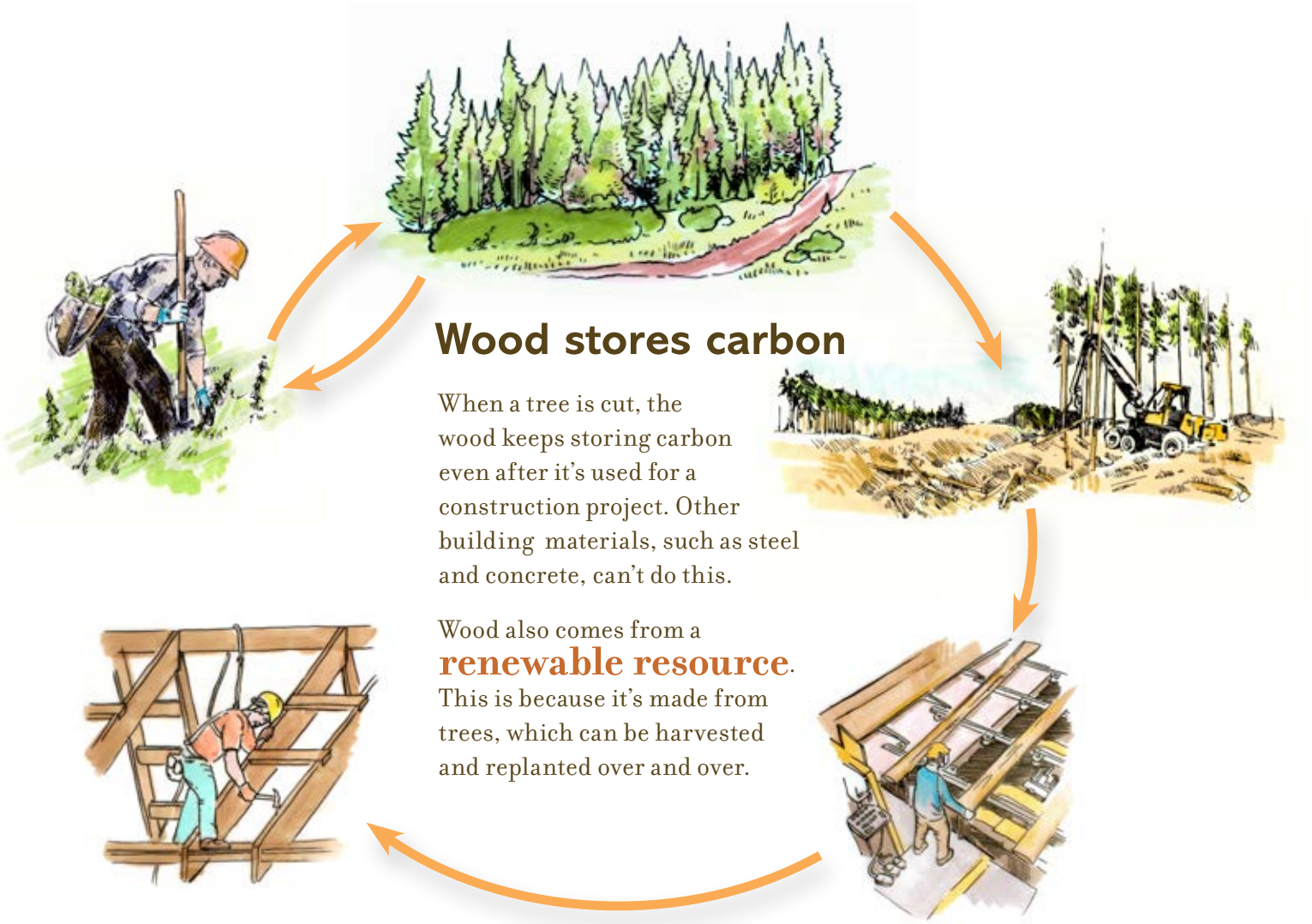
You may have heard that our planet is getting warmer. This rise in the average temperature of land and water on Earth, and its effects on the planet, are called **climate change**.

The small rise in the earth's temperature is starting to have an impact. Ice on the north and south poles is melting. The seas are rising. We're having worse storms.

One of the causes of climate change is too much **carbon dioxide** in the atmosphere. Carbon dioxide is a type of gas that humans produce when breathing, driving cars or making electricity and heat. It holds in the sun's heat like wrapping a warm blanket around the earth.

What does this have to do with forests? It turns out the trees in forests, and the wood products that come from them, can help fight climate change.

During photosynthesis, trees absorb carbon dioxide from the **atmosphere**. They then turn the carbon dioxide into solid carbon and store it in their wood. Most of this stored carbon stays out of the atmosphere even after a tree is cut down and the wood is used to build something, such as a house, office or apartment building.



Wood stores carbon

When a tree is cut, the wood keeps storing carbon even after it's used for a construction project. Other building materials, such as steel and concrete, can't do this.

Wood also comes from a **renewable resource**. This is because it's made from trees, which can be harvested and replanted over and over.

WORDS TO KNOW:

atmosphere

The mixture of gases that surrounds Earth.

carbon dioxide (CO_2)

A gas with no color or smell. It is formed by burning fuels and when people and animals exhale (breathe out). Plants absorb carbon dioxide during photosynthesis.

climate change

The rise of the average temperature of land and water on Earth, and the effects this has on the planet.

renewable resource

A natural resource that can be replenished over time, such as trees.

What do you think?

How do forests help fight climate change?

Caring for our forests

Forests do a lot of good things for us.

There are many products, such as wood and paper, that come from forests. People have jobs working in the forest. We have clean drinking water because of the forest. Trees and all the other plants in a forest release oxygen into the air that people and animals breathe. Fish and wildlife call the forest their home.

These are some of the many reasons it's important to care for our forests. There are plenty of things you can do to help. The future of our forests depends on all of us.

Ways to help Oregon's forests

PREVENT WILDFIRE: Lightning starts some fires, but people start many fires by accident. Be careful not to start a forest fire. Always make sure to fully put out campfires.

PICK UP LITTER: Trash isn't just ugly; some types of trash can hurt animals or fish. So pick it up and throw it away properly.

RECYCLE: Paper is made from trees. Reuse and recycle as much as you can.

STAY ON MARKED TRAILS: It's best to stay on the trail when you are hiking, camping or biking in the forest. This disturbs the forest as little as possible. Taking a shortcut could cause damage, such as killing plants.

Word search

Find the vocabulary words you learned in this book. They may be across, up and down, diagonal, and even backward.

ATMOSPHERE
BROADLEAF
CLIMATE
CONIFER
ELEVATION
ECOSYSTEM
EVERGREEN
FOOD CHAIN
FOOD WEB
PHOTOSYNTHESIS

F	G	N	I	A	H	C	D	O	O	F	W	Y	K	L	E	U
O	O	D	L	P	F	F	E	T	X	B	T	A	O	C	P	F
F	W	C	W	Y	G	Q	Q	R	B	E	W	D	O	O	F	A
C	L	I	M	A	T	E	U	J	E	N	U	S	U	J	Y	E
P	N	E	E	R	G	R	E	V	E	H	Y	Z	P	X	U	L
F	F	P	Q	K	P	B	G	O	G	S	P	M	S	R	Q	D
T	P	H	O	T	O	S	Y	N	T	H	E	S	I	S	K	A
Q	Z	K	O	S	Q	C	U	E	G	F	O	N	O	H	P	O
K	M	H	M	R	U	A	M	O	W	C	L	T	G	M	S	R
N	O	I	T	A	V	E	L	E	V	H	P	D	J	M	T	B
I	S	T	C	O	N	I	F	E	R	G	W	D	O	H	V	A

photo: Godofredo Vasquez, Philomath Express

VOLUNTEER TO MAKE FORESTS BETTER: There are many groups that help take care of forests. They often need help with projects such as cleaning trash out of streams, building trails and planting trees. Become a volunteer and help make forests better.

Take action

What can YOU do to help forests?

ABOUT OFRI

The Oregon Legislature created the Oregon Forest Resources Institute in 1991 to advance public understanding of how forest stewardship meets the social, environmental and economic needs of both present and future generations. OFRI works closely with the scientific, academic and educational communities at Oregon State University, the Oregon Department of Forestry and other agencies to ensure its K-12 resources are accurate and objective.

Oregon Forest Resources Institute

LearnForests.org
OregonForestCareers.org

Follow OFRI on Facebook, Twitter and Instagram.

ANSWERS (No cheating!)

Page 3: Hawk, blue jay, squirrel, woodpecker, frog, rabbit and mouse.

Page 9: Historic plank house: roof, floor, walls, post, beds, firewood. Modern wooden house: roof, window frame, floor, door, shelf, dresser, bed, stairs, porch, firewood.

Page 11: 17 rings.

Page 15: Cutting trees – crosscut saw, logging machine. Moving logs – horse-drawn wagon, log truck. Finding direction – compass, GPS device. Communicating – crank telephone, walkie-talkie. Recording notes – pen and paper, electronic tablet. Fighting fires – water pail, helicopter bucket. Safety – hard hat, logging helmet.

Page 19: Green leaves on trees and green plants on the forest floor.

Page 21: Forest trees reduce the amount of carbon dioxide in the atmosphere because they store carbon in their wood.