

The Wonderful World of Plants

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By Ron Fridell

www.sciencea-z.com

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KEY ELEMENTS USED IN THIS BOOK

The Big Idea: Our world is full of plants. Plants have parts, and each part has a function. Plants survive through the processes of photosynthesis, pollination, fertilization, seed dispersal, and germination. Plants and animals rely on each other. People use plants for both food and materials. Without plants, animals—including humans—could not survive.

Key words: absorb, carbon dioxide, chlorophyll, chloroplast, cone, egg, fertilization, flower, fruit, germinate, leaves, materials, minerals, nutrients, oxygen, photosynthesis, pistil, plants, pollen, pollination, reproduce, roots, seed, seedling, shelter, soil, species, sprout, stamen, stem, stomata, vegetable, water vapor

Key comprehension skill: Main idea and details

Other suitable comprehension skills: Compare and contrast; classify information; cause and effect; identify facts; elements of a genre; interpret graphs, charts, and diagrams

Key reading strategy: Ask and answer questions

Other suitable reading strategies: Connect to prior knowledge; summarize; visualize; retell

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Table of Contents

Introduction	4
The Parts of a Plant	6
How Plants Make Food.....	9
How Plants Reproduce.....	11
Plants Live (Almost) Everywhere.....	15
Plants and Animals	16
Plants and You	17
<i>Using Plants for Food</i>	18
<i>Using Plants for Materials</i>	20
Conclusion	22
Glossary	23
Index	24



Introduction

Imagine a family is going out for dinner. The kids put on clean clothes. At the restaurant, Mom parks the car under a large tree. Inside, everyone sits at a wooden table. Dinner includes potatoes and fresh vegetables. They have fruit pie for dessert. They take the leftovers home in a cardboard box.

Think about the clothes, tree, table, food, and box. What do they have in common? They all come from **plants!** You see plants almost everywhere. You also use plants in so many ways.

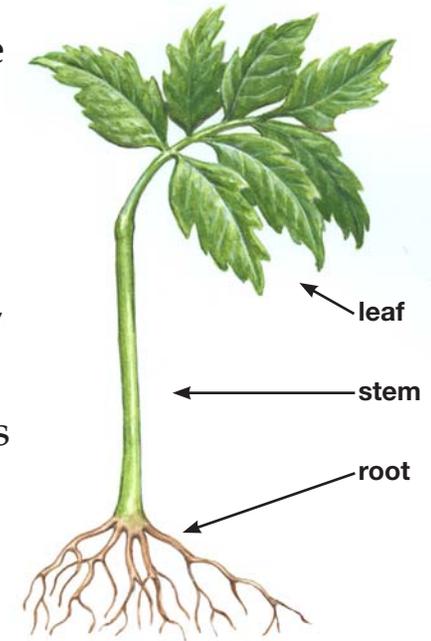


In this book, you will learn what plants need in order to live. You'll learn how they make their own food and how they make more plants. You'll also learn how animals and plants depend on each other.

Plants are important living things.
You would not survive without plants!

The Parts of a Plant

Most plants have the same basic parts. Each part helps the plant get the water, air, **minerals**, and light that it needs to survive.

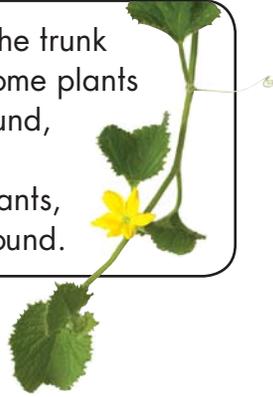


The *roots* of a plant have important jobs. Roots usually grow down into the soil. In most plants, roots anchor, or hold, the plant in place. They help keep the plant upright, too.

Roots absorb water and minerals from the soil. Minerals are the nutrients that help plants grow and be healthy. The roots also store some of the food made by the plant.

Do You Know?

The stems of some plants are long. The trunk and branches of a tree are stems. Some plants have stems that creep along the ground, such as the vines of a strawberry or pumpkin plant. The stems of some plants, such as white potatoes, are underground.



The *stem* of a plant supports the leaves. It usually grows toward the Sun so the plant can get sunlight. The stem also moves water and minerals from the roots to other parts of the plant. And like roots, stems can store food and water for the plant.



Stems can be hard or soft, thick or thin, and long or short.



Leaves come in a wide variety of shapes and sizes.

Leaves are another important part of most plants. Leaves are where plants make most of their own food. Leaves also get rid of the waste products that are made when the plant makes food.

Leaves grow above the ground where the light is. They are usually flat, which helps them catch sunlight.

Try This

Study a leaf and talk about it. Are the edges smooth, wavy, or toothed like a saw? Is the tip pointy, rounded, or dented? Is the surface smooth, rough, bumpy, hairy, sticky, or waxy? Does light pass through the leaf?

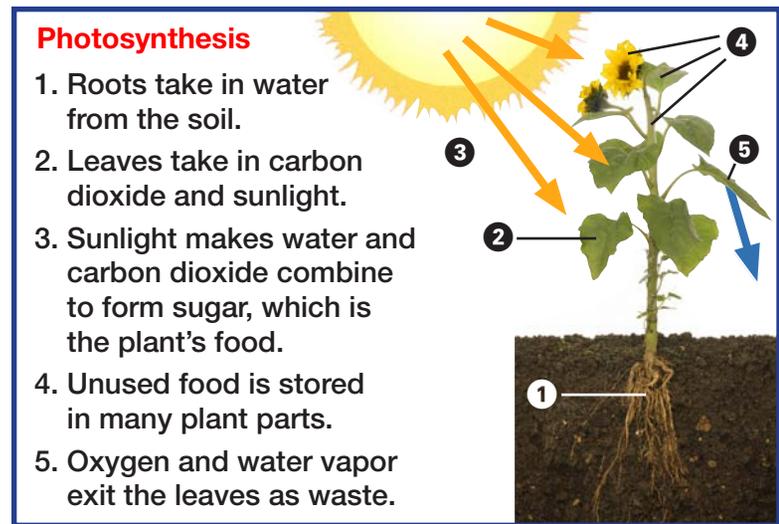
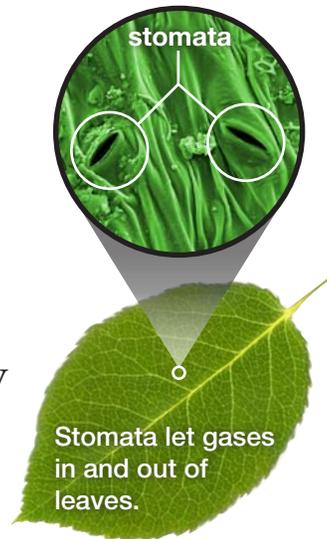


How Plants Make Food

Plants make their own food. This process is called photosynthesis. A plant needs three things for **photosynthesis**: water, air, and light.

Roots absorb water from the soil. The water moves through the stem and reaches the leaves. Air enters the leaves through tiny openings. The air has a gas called *carbon dioxide* in it. The plant needs the water and carbon dioxide to make food.

As plants make food, they give off two gases as waste—*oxygen* and *water vapor*. Animals breathe the oxygen. Water vapor is water in the form of a gas.



Photosynthesis

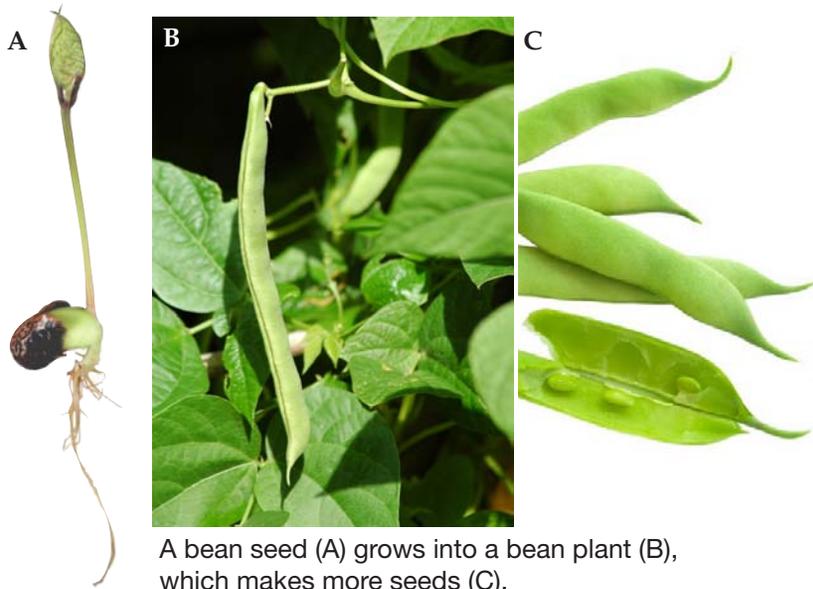
1. Roots take in water from the soil.
2. Leaves take in carbon dioxide and sunlight.
3. Sunlight makes water and carbon dioxide combine to form sugar, which is the plant's food.
4. Unused food is stored in many plant parts.
5. Oxygen and water vapor exit the leaves as waste.

Leaves have thousands of tiny parts called **chloroplasts**. These parts are where food is made. Chloroplasts have a special green substance called **chlorophyll**. This substance is what makes most plants green. Chlorophyll collects light energy from the Sun. The Sun's energy mixes carbon dioxide and water inside each chloroplast. This step makes a simple kind of sugar. This sugar is the plant's food. The plant uses it to grow. The plant stores any unused food in its roots, stems, and leaves.

How Plants Reproduce

Palm trees make new palm trees. Tomato plants make new tomato plants. The same is true for all types, or **species**, of plants. Each plant species must **reproduce**. This means it must make more plants just like it so the species will survive.

Most plants reproduce by making *seeds*. These seeds grow into new plants that are like the plant that made the seeds.



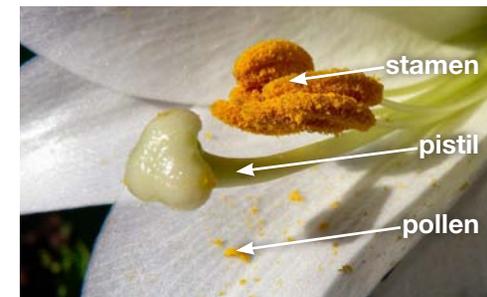
A bean seed (A) grows into a bean plant (B), which makes more seeds (C).

On many plants, seeds are made in the *flowers*. Flowers have male and female parts. Some flowers have only male or female parts. Many flowers have both male and female parts.

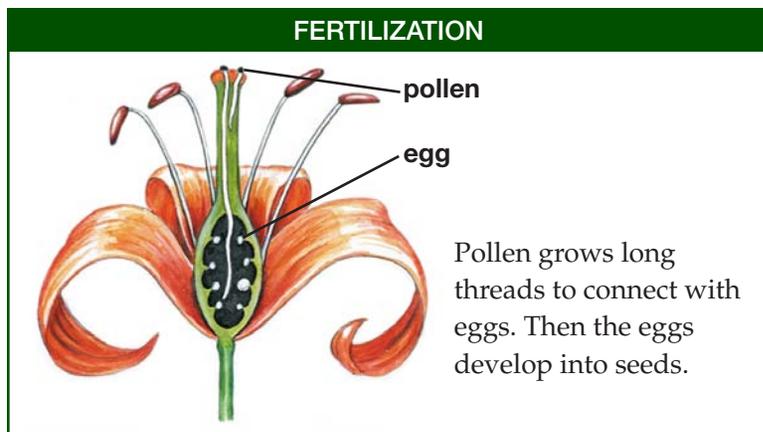
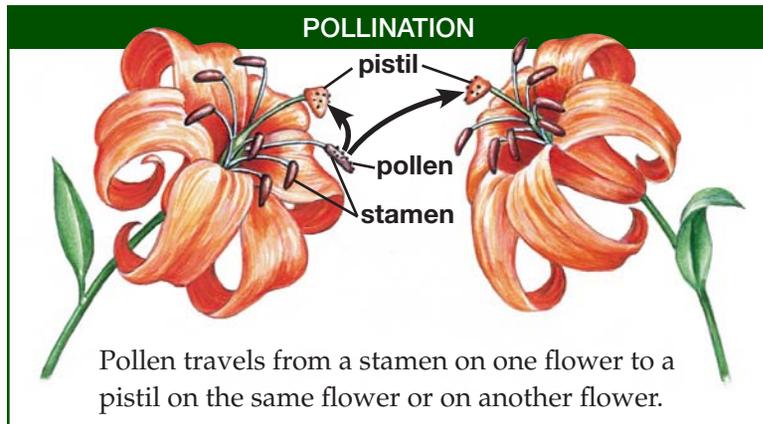


The male part of a flower is called the **stamen**. It produces tiny grains of **pollen**. The pollen grains are often carried to another flower by the wind. Animals such as bees, bats and birds also help carry pollen.

The female part of the flower is called the **pistil**. Pistils tend to be sticky. The pollen from a stamen on one flower will stick to the pistil on another flower of the same plant species. This process is called **pollination**.



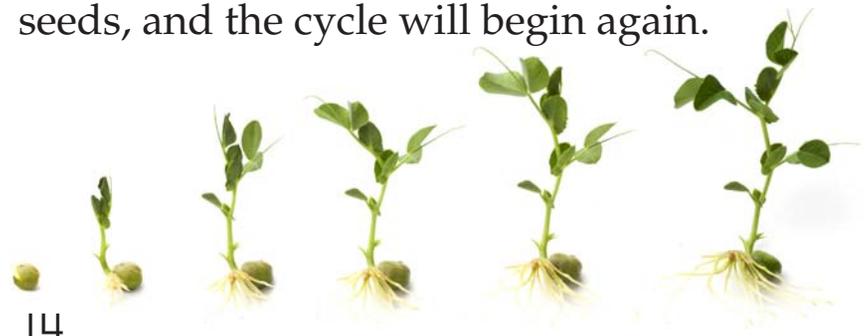
After landing on the pistil, a pollen grain grows a tiny threadlike piece. This thread grows down into the pistil, where eggs are kept. The pollen has special male cells that help the plant reproduce. These cells join with the eggs. This step is called **fertilization**.



After fertilization, each egg develops into a seed. The pistil often swells up to become a **fruit** with new seeds. Some plants, such as pine trees, produce seeds in cones instead of in flowers.

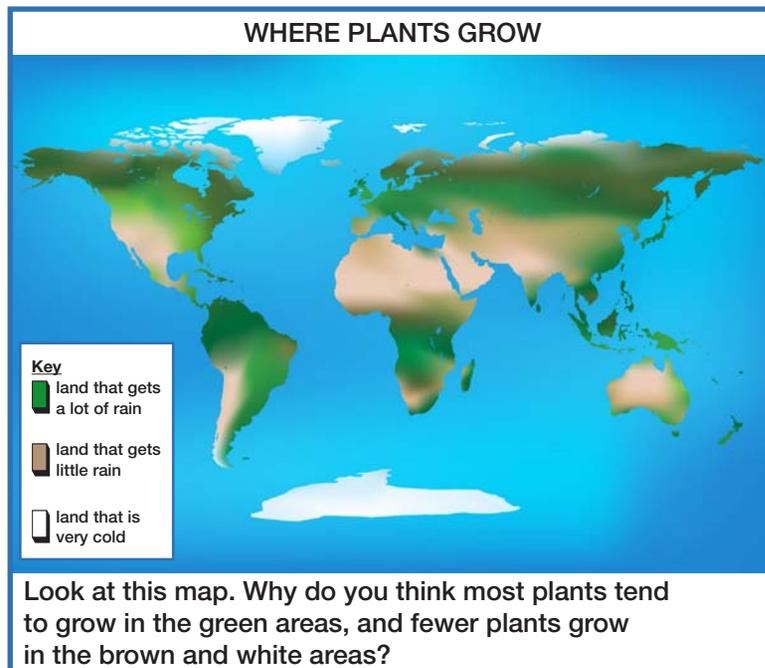


When conditions are right, a seed will sprout, or **germinate**. Many plants need water and warm temperatures before they begin to grow. The tiny plant is called a **seedling**. It will grow into a full-sized plant. Then it will produce its own seeds, and the cycle will begin again.



Plants Live (Almost) Everywhere

Plants live almost everywhere on Earth. They grow inside and outside. They grow in rainforests and deserts, and on lush farmland and barren tundra. They grow on mountaintops and in the open ocean. Plants grow in soil, in sand, on rocks and in the water. Plants grow wherever they can get what they need: sunlight, water, carbon dioxide, and minerals.



Plants and Animals

You know that animals get food and oxygen from plants. Animals also need plants for other things. Birds use twigs and leaves to build nests. Woodpeckers make their homes inside trees or cacti. Lions nap in the cool shade of a tree.

Plants need animals, too. Plants take in carbon dioxide to make food. The carbon dioxide comes from animals when they breathe out.

Plants and You

Around the world, people depend on plants. People pick wild plants and eat them. Farmers grow and harvest plants so people have food to eat. Much of what people need—such as shelter, paper, cooking supplies, and clothing—also comes from plants.



Using Plants for Food

Much of what you eat comes from plants. When you think of eating plant parts, you might think of the fruit you eat. Grapes, apples, oranges, and peaches are all fruits. Some foods we eat as *vegetables* are fruits, too. Tomatoes, cucumbers, and squash hold the plant's seeds. So they are the fruit of their plant, even if we call them vegetables.

Many foods come from other parts of the plant:

- Sweet potatoes and yams are big roots.
- When you eat asparagus, you are eating stems.
- When you eat broccoli, you are eating unopened flowers.
- Lettuce, spinach, and collard greens are all leaves.





In a way, even meat comes from plants. Animals get energy by eating food. Animals either eat plants or they eat animals that ate plants. If you have ever eaten meat, you got energy from plants, too. The energy passed from a plant to at least one animal, and then on to you.

Using Plants for Materials

Plants give us food, and they also provide us with many useful **materials**. The wood in our buildings comes from trees. Wooden furniture, paper, and cardboard boxes begin as trees, too. Most cloth in our clothing is made from fibers that come from plants. Even the coal and oil that we use for fuel were living plants millions of years ago.



Many medicines are also made from plants. In fact, soap, paint, shampoo, perfume, makeup, ink, chewing gum, and rope are often made from plants, too!



Conclusion

Plants grow almost everywhere on Earth. They feed us. They fill our lungs with oxygen. Without plants, animals could not survive.

Plants also give us many of the products we use every day. All around you are things made from plants.

Plants add another thing to our lives—beauty! They come in many shapes and sizes. They have many colors and patterns. Earth is more beautiful because of its forests, meadows, and flowers. Our world truly is a wonderful world of plants.

Think About It

Which items in your classroom or home come from plants?
What are the rest of the items made of?



Glossary

chlorophyll	a material in green plants that can turn water, air, and sunlight into food (p. 10)
chloroplasts	the parts of a plant cell that contain chlorophyll and make energy from sunlight, air, water, and nutrients (p. 10)
fertilization	the process of combining male and female cells to create a new animal or plant (p. 13)
germinate	to begin to grow from a seed (p. 14)
materials	any kinds of physical substances that are used to make things (p. 20)
minerals	nutrients from nonliving things that are required in small amounts for health and normal growth (p. 6)
photosynthesis	the process by which plants turn energy from the Sun into food (p. 9)
pistil	the female part of a flower, where seeds begin to grow (p. 12)

plants	living things that make their own food from sunlight and do not move from place to place on their own (p. 4)
pollen	male flower cells, which often look like fine yellow powder (p. 12)
pollination	the transfer of pollen from flower to flower for the purpose of fertilizing a plant (p. 12)
reproduce	to make offspring that are similar to the original living thing (p. 11)
seedling	a young, developing plant that has grown from a seed (p. 14)
species	a group of living things that are physically similar and can make offspring (p. 11)
stamen	the male part of a flower, where pollen is made (p. 12)

Index

fertilization, 13, 14	pollination, 12, 13
germination, 14	reproduction, 11–14
photosynthesis, 9, 10	