

# All About Plants



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## What are plants?

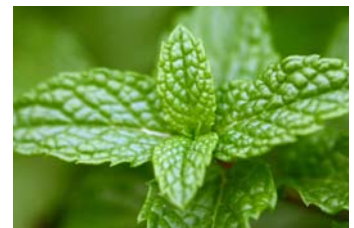
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Plants are living things that are made up of cells. They need air, water, soil, and sunlight to live. They cannot move from place to place, but their leaves move to catch the sun and their roots move towards water. Their seeds can be carried by animals or blown by the wind.

We get food from all different parts of the plant: flowers, fruits, vegetables, seeds, nuts, stems, and leaves. Grass gives us a cool, soft place to walk. Some plants give us medicine, and trees are used to make paper and furniture.

In this book, you will learn about how plants are classified (organized), how they live, and how they make their own food. You will discover that the world uses plants in many different ways.

Over 270,000 species of plants have been identified and classified, but scientists believe that there are millions more waiting to be discovered.



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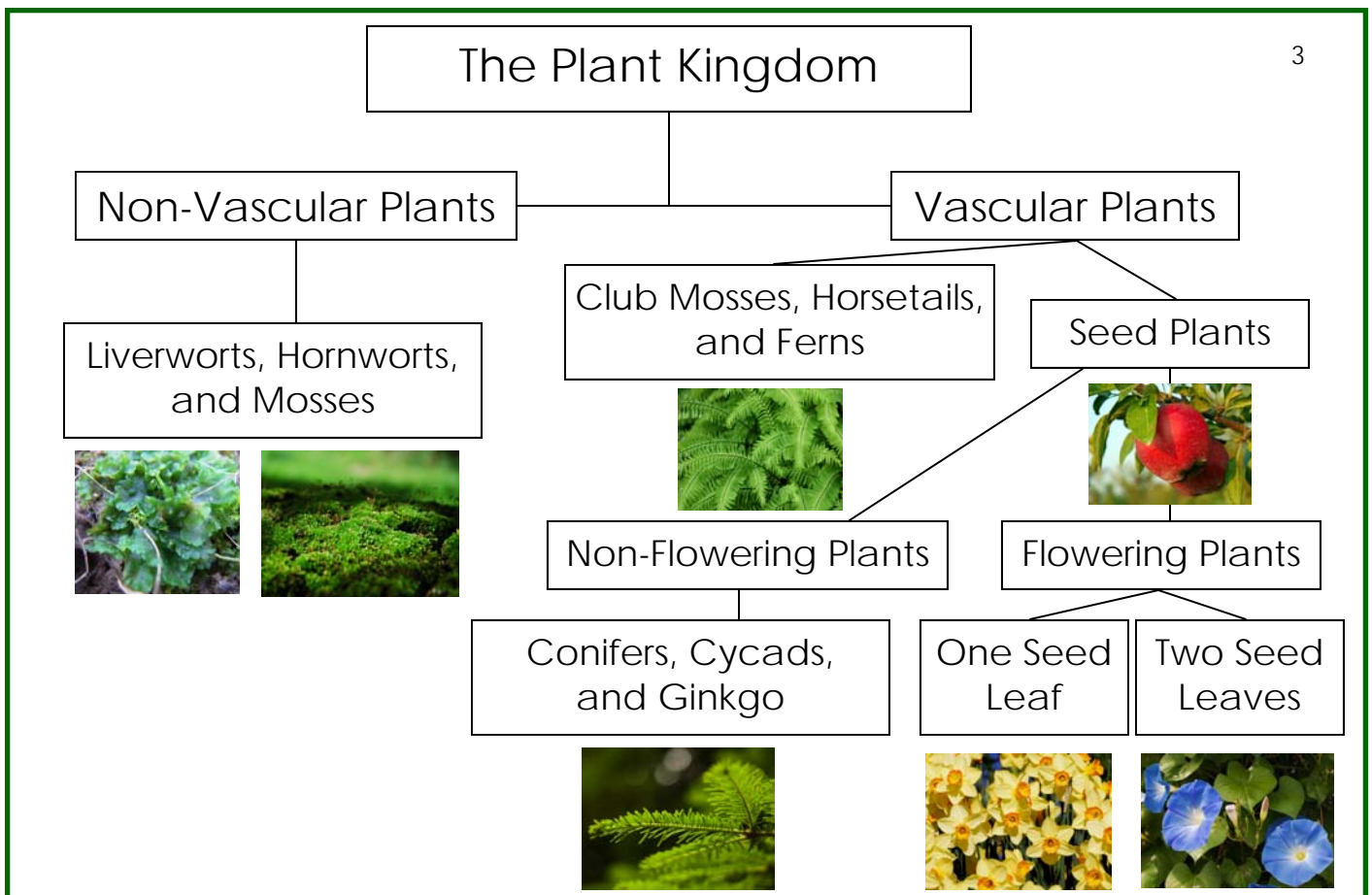
# About the Plant Kingdom

The Plant Kingdom is a way to classify (or organize) plants. They are divided into groups based on the traits they have in common. Scientists change the way plants are classified from time to time, when they discover new types of plants or learn new things about plants.

The two main groups are vascular plants (plants that use stems and veins to transport food and water), and non-vascular plants (plants with no roots, stems, or leaves).

Vascular plants can be divided into smaller groups, one of which is seed plants. This group includes flowering and non-flowering plants. Flowering plants include monocots (one seed leaf) and dicots (two seed leaves). The non-flowering plants can also be divided into several groups, including cycads, conifers, and ginkgo.

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## All About Flowering Plants

All green plants that have flowers are called flowering plants. Scientists have grouped these according to the number of seed leaves found in each plant.

Monocots (or monocotyledons) have one seed leaf; dicots (or dicotyledons) have two seed leaves. These leaves provide the food the young plant needs until it can make its own food. Flowering plants consist of four main parts: (1) roots, (2) stem, (3) leaves, and (4) flowers.



Dicot  
(two seed leaves)



Monocot  
(one seed leaf)

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## All About Non-Flowering Plants

Plants without flowers are called non-flowering plants, or gymnosperm. While they do produce seeds, the seed is not enclosed in a flower (and eventually a fruit) the way seeds are in flowering plants.

Non-flowering plants are very common, and include evergreens (conifers), cycads, and ginkgo. Popular types of conifers include fir and pine trees. These trees are characterized by sharp needles and produce cones that hold the seeds. *(See picture: pine cones and needles)*



Cycads are tropical plants with compound leaves and a sturdy trunk. Ginkgo trees are one of the oldest kinds of trees known to exist. They are usually very tall and have unique fan-shaped leaves.

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## All About Trees

There are two different types of trees: non-flowering trees that have seeds that are not enclosed, and flowering trees that have seeds that are enclosed. An example of a non-flowering tree would be a pine tree. An example of a flowering tree would be a fruit tree, such as peach or orange.

Flowering trees are deciduous; that is, they shed their leaves every year. Other trees are conifers; they grow new leaves before shedding old ones, and stay green all year round ("evergreen").

Trees consist of roots, trunk (stem), branches, twigs, and leaves. The tallest trees in the world are the redwoods of California, which can grow to be 379 ft (115.55 m) in height.



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## All About Roots

The roots of a plant have root hairs that absorb water and minerals from the soil. The root caps protect the root when it bumps into hard things under the ground.

The roots of a plant always grow towards water. They will even grow around rocks or other obstacles to reach water. They also help anchor the plant in the ground, and keep soil in place so it is not washed away.

Some of the food we eat comes from roots, like carrots, beets, turnips, radishes, and potatoes. These are roots that store food for the growing plant.



Radishes—an edible root.

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## All About Leaves

Leaves help plants make their own food. Within the leaf is a green material called chlorophyll. Chlorophyll absorbs sunlight to make a natural sugar that the plants uses for food.

This process is called photosynthesis. During photosynthesis, carbon dioxide is used by the plant, and oxygen is released. This makes trees and plants a great way to keep the air on earth fresh and clean.

The leaf has veins for carrying this sugar to other parts of the plant. The flat, green part of the leaf is called the blade. The edge of the leaf is called the margin. A good nickname for leaves is "suncatchers", because they catch the sun that the plant needs to make food.

In the fall, leaves lose their chlorophyll. That allows the other colors in the leaf to show, so that we see yellow, orange, red, and even purple leaves.



## All About Flowers

Plants use flowers to reproduce (make more of themselves). The flower's job is to produce a fruit, which contains seeds. Flowers are used by humans to add beauty to outdoor and indoor areas, and some flowers can also be eaten.

Flowers, or blossoms, are made up of petals, called the corolla, which are usually brightly colored. The bright colors attract birds and insects, who spread pollen from one flower to another. This fertilizes the seeds and allows new plants to grow.



Other parts of the flower include the calyx, the green leaves that surround the petals; the stamen, which produces the pollen; and the pistil, which receives the pollen from another flower to fertilize the plant.

# All About Seeds

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Many plants use seeds to reproduce. A plant produces a very small version of itself, called an embryo. This embryo, together with its stored food, is covered with a thin covering called the testa (seed coat). The embryo, stored food, and testa make up the seed.

This seed will grow into a new plant. The seed uses the stored food to grow until it is big enough to make its own food, using its leaves. The seed coat protects the seed until it is ready to grow.

For a seed to germinate (start to grow), it needs to be in moist soil. The water causes the testa to split apart. Then the root tip of the seeds can grow into the ground.

Plants spread their seeds in many ways. Some seeds are blown by the wind; others are carried by insects, birds, or mammals. Nuts, a type of seed, are often buried in the ground by animals and some result in new plants. Some seeds fall into water and are carried to new places.



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# All About Fruit

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Some plants grow a covering for their seeds. This ripened part of the seed is called fruit. Tomatoes, apples, and peaches are some of the plants that grow in this way.

Vegetables are actually the fruit part of the plant. Generally, the ripened part of the plant is called "fruit" if it is sweet, and "vegetable" if it is savory, or less sweet.



The outer skin of the fruit is called the exocarp. The fleshy part of the fruit, the part we eat, is called the mesocarp. The inner part of the fruit that covers the seeds is called the endocarp. All three of these layers put together are called the pericarp.

Humans and animals use fruits and vegetables as a great source of food. Most fruits can be eaten raw, although they can also be cooked or baked. Vegetables generally taste better after being cooked.

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# All About Stems

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There are several different types of stems. Flowering plants like carnations and tomatoes have soft stems. Trees and bushes have hard, woody stems.

Woody stems have an outer covering called bark. Underneath the bark is a layer of growing cells called cambium. Every year, trees grow another layer of cambium. Counting these layers (or rings) tells you how old the tree is.

The stem of a plant has five main jobs: (1) to support the leaves, flowers, and fruit of the plant; (2) to act as a highway, bringing water and nutrients to the plant; (3) the storage of food for the plant; (4) holding up the leaves so that they can catch sunlight; (5) producing new living tissue for the plant.

Some stems are edible—asparagus (shown) and rhubarb are two examples.



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# Sentence Completion

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Find the correct word to complete the sentence and write it on your paper.

1. The \_\_\_\_\_ of a plant hold it in the ground.
2. A \_\_\_\_\_ is a living thing that makes its own food.
3. The \_\_\_\_\_ of the flower produces pollen.
4. \_\_\_\_\_ is the substance that makes leaves green.
5. Some flowers make a cover for their seeds. This is called \_\_\_\_\_.
6. The roots are protected by the \_\_\_\_\_.
7. The plant uses air, water, and \_\_\_\_\_ to make its own food.
8. Plants use flowers to \_\_\_\_\_.
9. The embryo of the plant is covered by the \_\_\_\_\_.
10. One of the jobs of a \_\_\_\_\_ is to support the leaves, flowers, and fruit.

fruit	chlorophyll	stamen	roots	stem
plant	seed coat	sunlight	root caps	reproduce

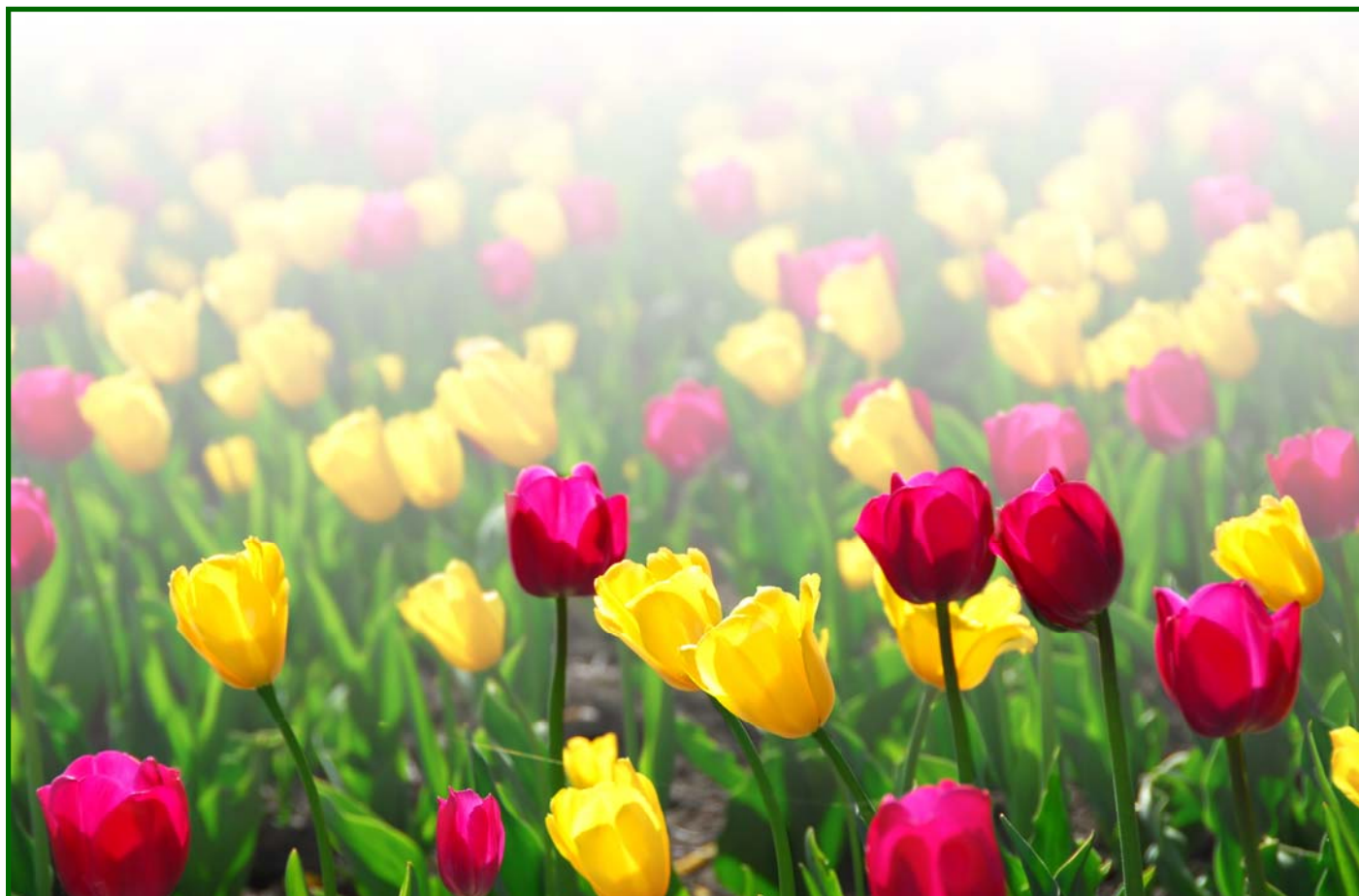
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## Self-Study Questions

Write the answers on your paper in complete sentences.

1. What two groups make up the plant kingdom?
2. Name one type of non-flowering plant.
3. How many seed leaves does a monocot have?
4. List the four main parts of a flowering plant.
5. Name two jobs of the root.
6. Name three kinds of roots that we eat.
7. What kind of stem do trees and bushes have?
8. Name two jobs of the stem.
9. How do leaves make food for the plant?
10. Why are the petals of a flower brightly colored?
11. What is the part of the fruit we usually eat?
12. Name the four things that a plant needs to survive.

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