4

SCIENCE

Quarter 2: Root and Shoot System

Root and Shoot System

Hello kid! How are you today? Can you do me a favor? Will you please look outside your home and have some time to look at the plants around you. What do you see? Plants come in many shapes and sizes, and they live in all kinds of places. Some grow in water, while others can survive in hot **deserts**.

Did you know that plants are essential for life on Earth? Without them, many **living things** wouldn't exist! Plants help clean our air, provide food, and give **shelter** to animals. Get ready, because in this lesson you will look closely at their unique parts, to describe why they are important. Have fun and enjoy the lesson!

What is it?

Plants are **living organisms** that are able to produce their own food through **photosynthesis**. They come in a wide variety of shapes, sizes, and colors. They provide food and oxygen for many other **living things**. Plants have two main systems: **root system** and **shoot system.**

A. Root System

Roots are often found below the surface of the soil. They absorb water and nutrients from the ground. They also anchor the plant in place. Some roots store food and nutrients for the plant's growth. It's essential for a plant's survival as it performs several crucial functions.

Parts of a Root System

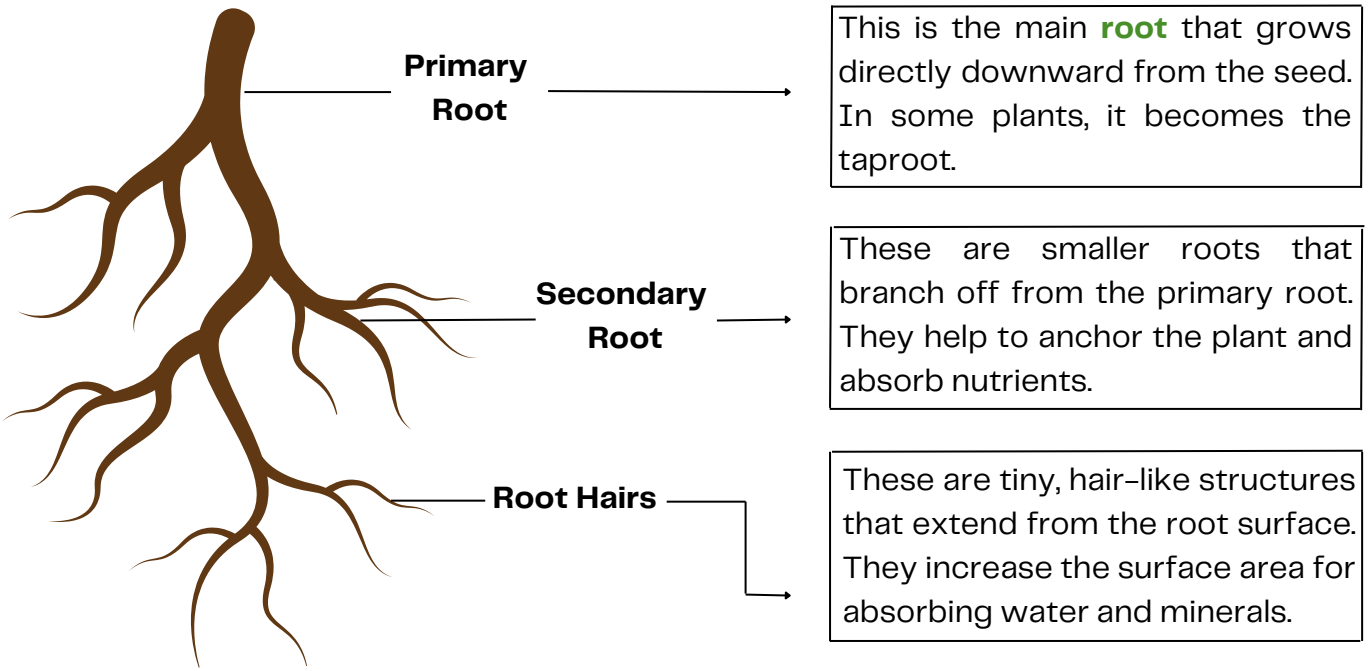


Figure 1. Root

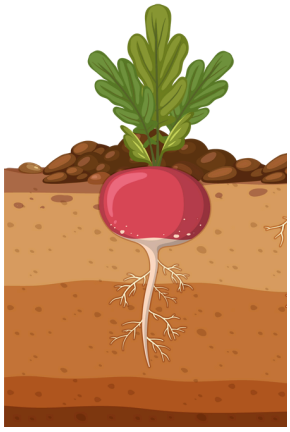
Importance and Roles of the Root System

1. Roots firmly anchor the plant to the ground, preventing it from being **uprooted** by wind or water.
2. Roots absorb water and minerals from the soil, which are essential for the plant's growth and development.
3. Some roots, such as carrots and radishes, store food for the plant.
4. In some plants, roots can provide additional support, especially in areas with **loose soil.**
5. While most **photosynthesis** occurs in the leaves, some plants have aerial roots that can absorb sunlight and perform **photosynthesis.**

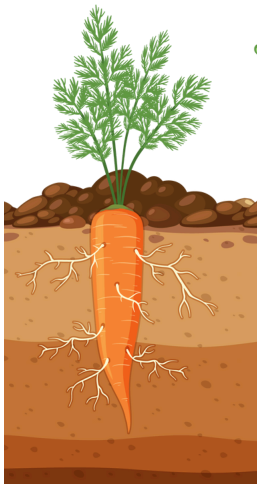
Types of Root System

Taproot is a type of root system has a single, thick primary root that grows deep into the soil.

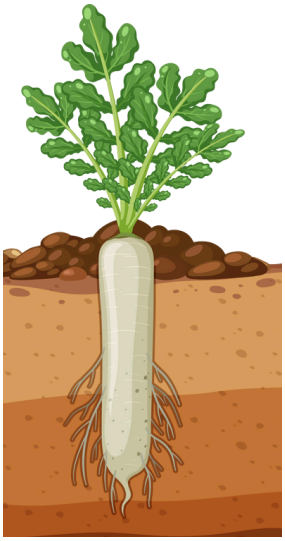
Examples:



Beetroot



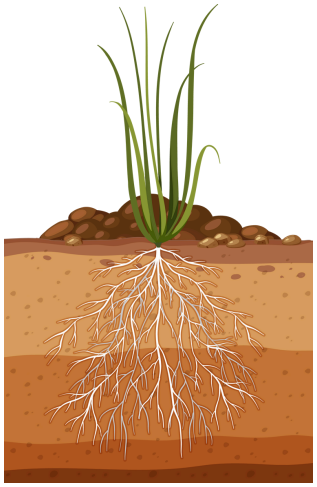
Carrot



Radish

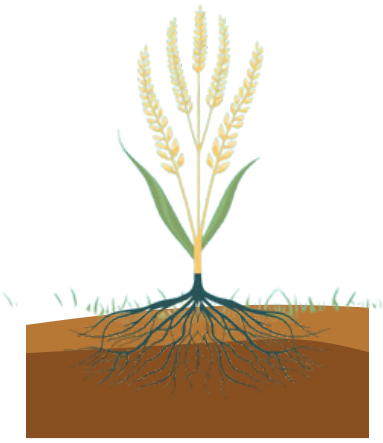
Fibrous Root is a type of root system has many thin, branching roots that spread out horizontally near the soil surface.

Examples:



Grass

Corn

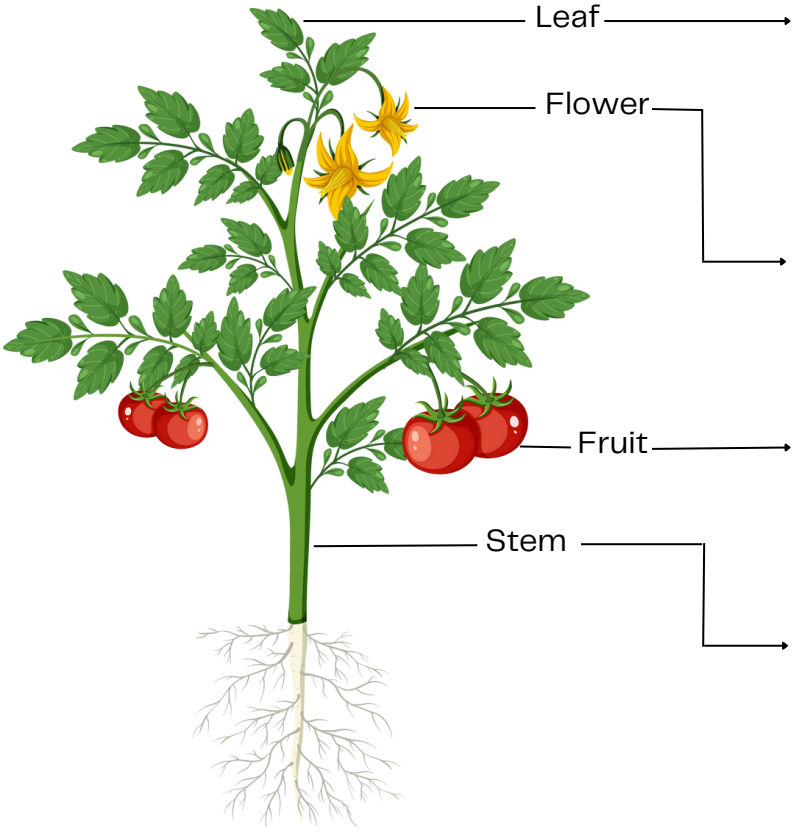


Wheat

B. Shoot System

The shoot system of a plant is the part that grows above the ground. It's like the plant's "body" that you can see.

Parts of a Root System



is flat and thin structures attached to the stem of a plant. They produce food for the plant through the process of **photosynthesis**.

is characterized by their colorful petals and sweet fragrance. They attract **pollinators** like insects and birds that help in the transfer of pollen from one flower to another. This transfer of pollen leads to seed production.

is the ripened ovary of the flower. Some plants are **fruit-bearing** while others are not. They protect and dispense seeds.

Stem helps hold the plant up, it also carries water and minerals from the **roots** to the leaves.

Figure 2. Plant

Importance and Roles of the Shoot System

1. Leaves play a **vital** role in **photosynthesis**, which is the process that allows plants to turn **sunlight** into energy. This energy helps the plant create its own food, making leaves essential for the plant's survival.
2. The stem acts like a strong support system for the plant, helping it grow tall and reach towards **sunlight**. This upward growth is important because more **sunlight** means better **photosynthesis**, which produces more food for the plant.
3. The shoot system is also responsible for moving water, nutrients, and food between the roots and leaves. It uses special **tissues** called **xylem** and **phloem** to transport these essential materials throughout the plant.
4. Flowers and fruits are key for reproduction. Flowers attract **pollinators**, like bees and butterflies, which help in the process of making seeds. Fruits protect these seeds and help them spread to new locations.
5. Leaves have tiny openings called **stomata** that allow for **gas exchange**. They take in **carbon dioxide** from the air and release oxygen, which is important for both plants and animals.
6. Some plants, like **cacti**, have stems that can store water. This adaptation helps them survive in **dry environments** where water is scarce.

References:

Department of Education. (2020). Science_Module_Grade 4. Scribd. https://www.scribd.com/document/551493102/Httpsdoc-00-80-Docsgoogleusercontent-comdocssecureschaOro937gcuc7l7deffksulhg5h7mbp1fhlni94pgubjgbue6lhOrspg33iv51l7164

Freepik. (n.d.). Detailed Illustration of Wheat Plant with Exposed Roots. https://encrypted-tbhO.gstatic.com/images?q=tbn:ANd9GcS6WhBB2fN38UjlwjHfu_uOYIABZoWbhlZxjyENQ7WlfHaHuMYNo8nQ&S=10

Root Corn Royalty. (n.d.). Shutterstock. https://images.app.goo.gl/EibYujUxX1ukYXbGA

YouTube. (n.d.). https://youtu.be/4Q2h-lzCbQw?feature=shared