

# Plant Dissection

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**Learning Objective:** Learn about plant anatomy.

**Prep Time:** 10 minutes

**Duration:** 30-50 minutes

## Learning content:

Hundreds of thousands of different species, or kinds, of plants grow on Earth. Some plants are so tiny that people can hardly see them. Others are trees that grow as tall as skyscrapers. Most plants have several things in common: they need sunshine, water, and air to grow. Their cells have stiff walls made of a tough material called cellulose. All green plants use the Sun's energy, water, and a gas called carbon dioxide to make their own food. This process is called photosynthesis.

Plants grow nearly everywhere on Earth. Most plants grow in soil, where they get their water and nutrients. But some plants do not need soil. Plants called epiphytes grow on hard surfaces, such as other plants or rocks, where they get most of the water and nutrients they need from rain and the air. Still other plants float in water. A few species of plant live on and get their nutrients from other plants.

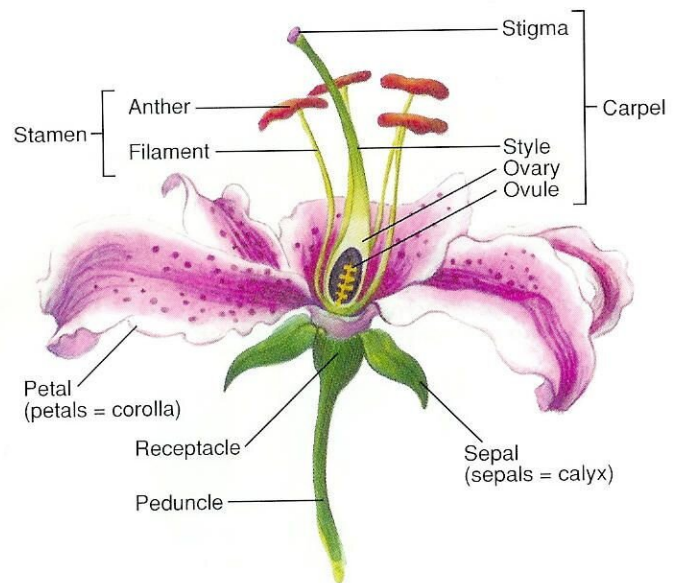
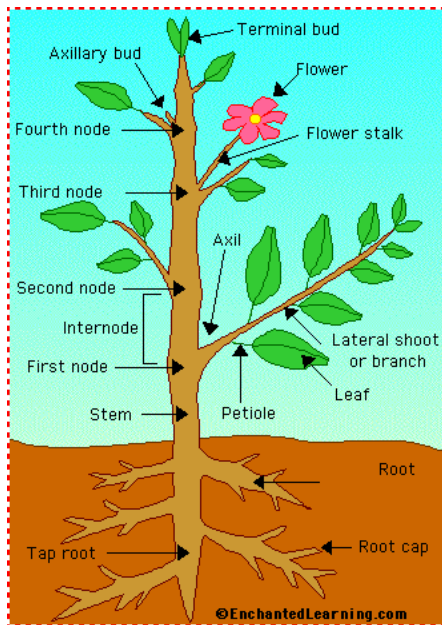
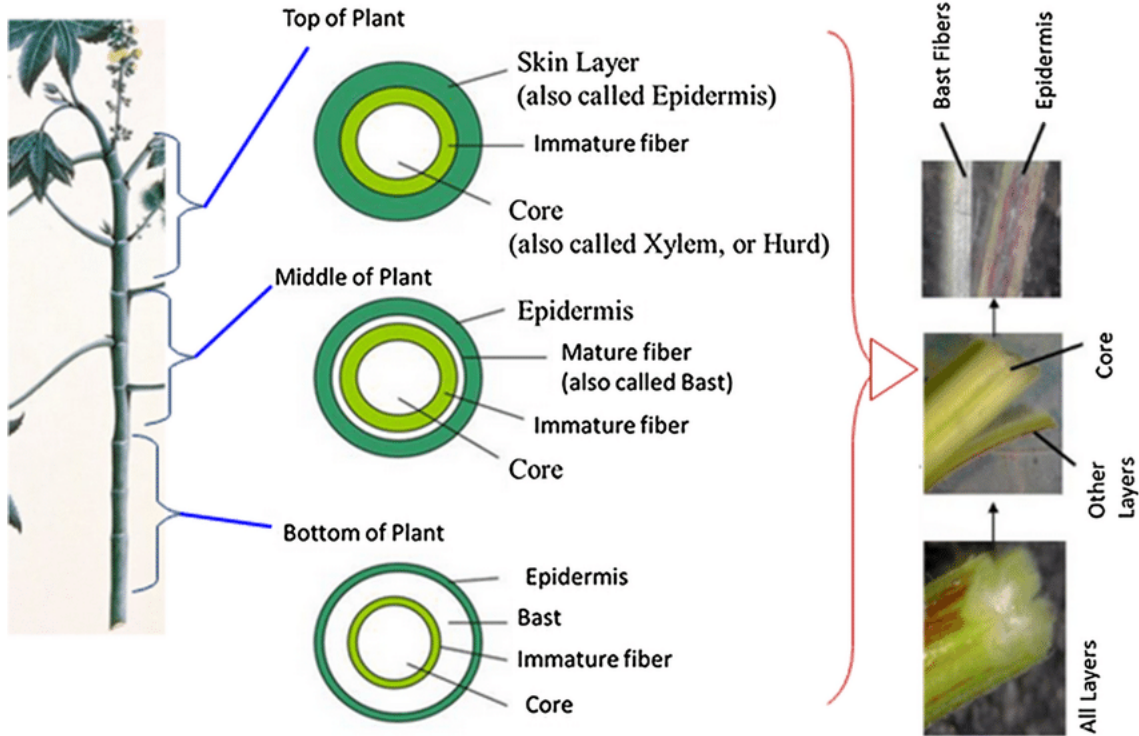
All plants belong to one of two main groups, vascular plants and nonvascular plants. Vascular plants have special tissues, called xylem and phloem, that carry water and food throughout the plant. Vascular plants also have roots, stems, and leaves. Vascular plants include herbaceous plants, shrubs, and trees. Herbaceous plants have soft stems. Shrubs and trees have woody stems. Nonvascular plants do not have xylem or phloem. They also lack true roots, stems, and leaves. Nonvascular plants include mosses, liverworts, and hornworts. They are generally small and grow in moist places.

Plants reproduce, or make more of their kind, either by seeds or spores. Seeds and spores are small structures that develop on plants and then fall off. They then may grow into new plants. Seeds are larger and more complex than spores. Most vascular plants reproduce by seeds. Most seed-bearing plants grow flowers. Fruits grow from the flowers, and seeds grow inside the fruits. Other vascular plants do not grow flowers or fruits. For example, the plants called conifers form their seeds inside cones. Conifers include pines, spruces, firs, and similar trees and shrubs. Nonvascular plants reproduce by spores. A few kinds of vascular plants, such as ferns, also reproduce by spores.

Sometimes plants can reproduce without spores or seeds. Stems, leaves, or other parts of a plant may grow into new plants. For instance, strawberry plants grow runners, or stems that creep along the ground. These stems may form roots and grow into new plants. This process is called vegetative reproduction.

Plants are vital to life on Earth. They provide food for people and animals. They also make the oxygen that other living things breathe. Plants produce the oxygen as part of the process of photosynthesis. Human beings use plants in countless ways. We get many foods, drinks, and flavorings from plants. We build homes from wood and many other parts of plants. People also burn wood for heat and energy. Many of

the fibers used to make cloth come from plants, especially cotton. Other useful things made from plants include medicines, paper, chewing gum, cork, rubber, and cocoa butter. People also use flowers for decoration. We plant trees and flowers in our yards and in large formal gardens. (Britannica Kids 2023)



## Supplies:

- Plants to dissect (e.g. tomato, avocado, flowers, peaches...)
- Knife or scalpel
- Cutting board or dissecting tray
- Gloves (if necessary)
- Diagram of plant to reference during dissection

## Set Up:

- Set up cutting board/trays and the plants either for individuals, groups, or demonstration
- Keep dissection instrument safely out of reach until safety expectations are established
- Set up plant diagram(s)

## Safety:

Establish expected behavior and safety rules with students regarding the use of scalpels and knives before the activity. spectrUM does not allow students to perform dissections independently.

## Activity:

1. Show students the plant that will be dissected and **make observations and predictions** about what's inside. Have you seen this plant before? Does it look like other plants you've seen?
2. Invite students to gently **touch and explore** the whole plant before the dissections. What do you think is inside the plant? Why do you think it's that color? Why would it grow into that shape?
3. Show students the **diagram** of the plant and invite them to make connections between the image and the dissected plant.
4. **Cut** the plant down the middle. Invite students to gently handle the plant, make observations, and discuss.
5. **Reflect.**

## Extension:

- Build time for students to collect plants outside to dissect (discuss when and where it's appropriate to collect plants).
- Invite students to "dissect" plants with scissors.
- Use magnifying glasses or microscopes explore plants closely and make comparisons.
- Older students can be encouraged to identify plant anatomy during the dissection and may label a plant diagram (many are available for free online).
- Discuss traditional uses of plants. Some can be found on spectrUM's website, [umt.edu/spectrUM](http://umt.edu/spectrUM)

## spectrUM Pedagogy:

**Inspire Curiosity:** Ask open-ended questions and encourage creative thinking.

**Encourage Growth Mindset:** Show students how to navigate the diagram and encourage them to use it during the dissection. Be available to help students when invited.

**Make Meaning:** Create personal connections between science and students by asking them about their relationship with plants.

**Navigate Your Future:** Let students know about resources and opportunities for them to continue to pursue an interest in botany, such as classes, clubs, camps, and higher education.

**Collaborate With Communities:** spectrUM has collaborated with many tribal representatives to connect science with Indigenous traditions. These resources can be found on spectrUM's website, [umt.edu/spectrUM](http://umt.edu/spectrUM).

**Try It:** Encourage student autonomy by providing them the opportunity to build their pollinators and problem-solve independently.