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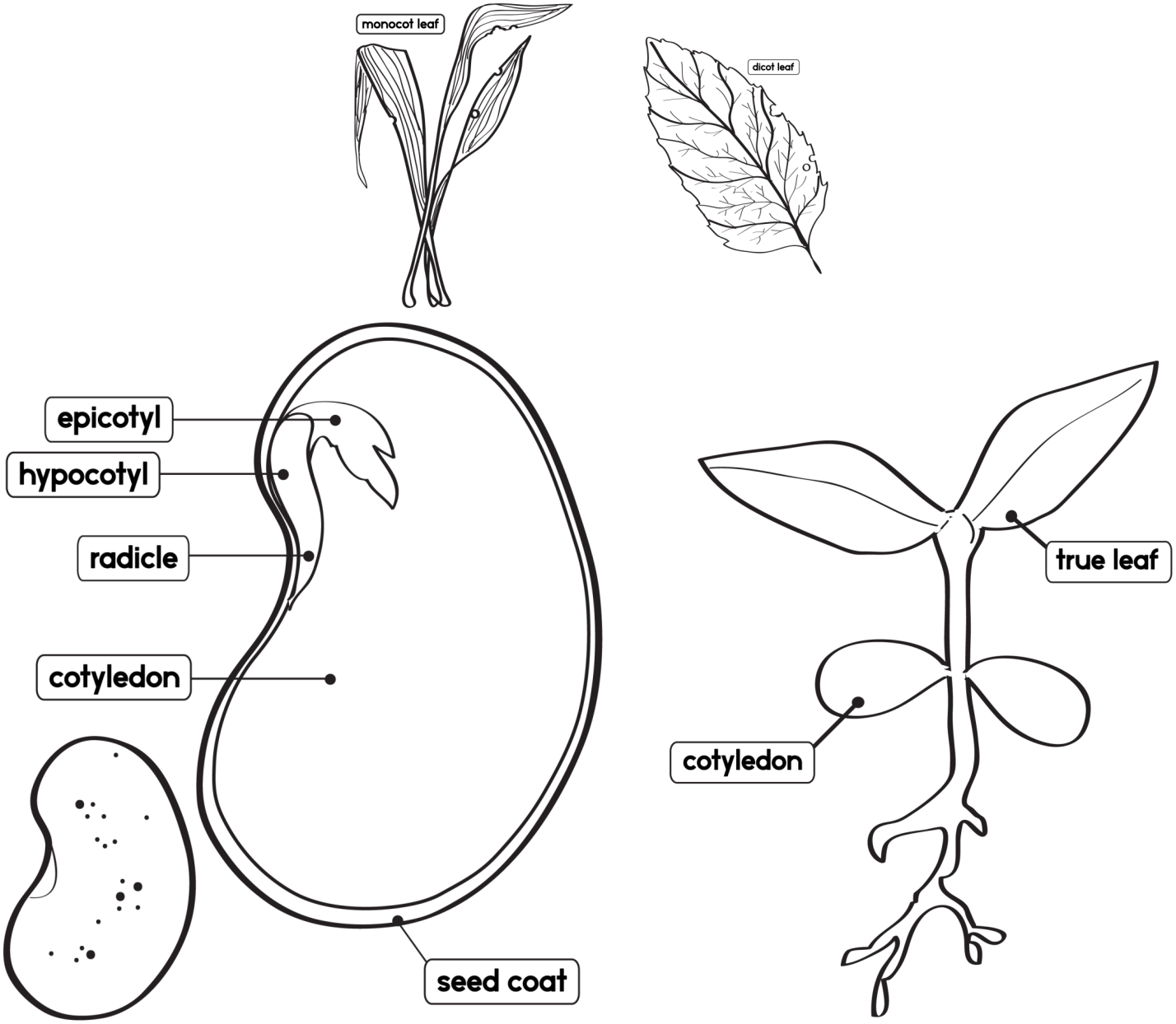
Parts of a Seed

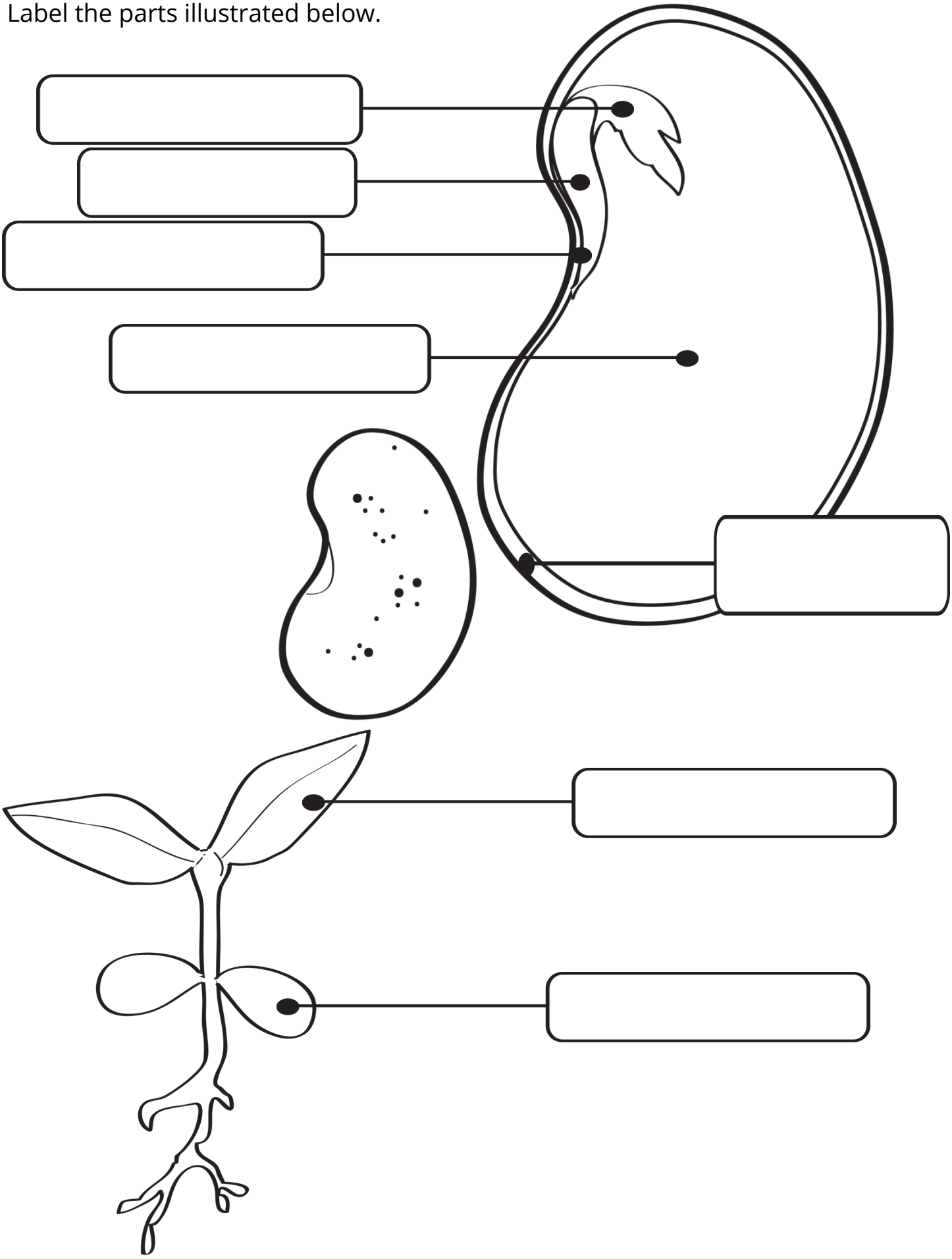
Most seeds come from flowering plants. These seeds have a seed coat that protects the seed. The seed coat also holds the embryo that will eventually grow into a new plant.

The epicotyl is a young shoot. It does not have fully developed leaves or a stem. The hypocotyl is below it. The radicle is beneath both and will grow into the first root the new plant has.

The cotyledon is a seed leaf. Some plants (monocots) have one cotyledon, while other plants (dicots) have two. Some common monocots are grains like wheat and barley. Dicots you've probably seen and eaten are peas and beans.



Label the parts illustrated below.



Methods of Seed Dispersal

Catching a ride on the wind

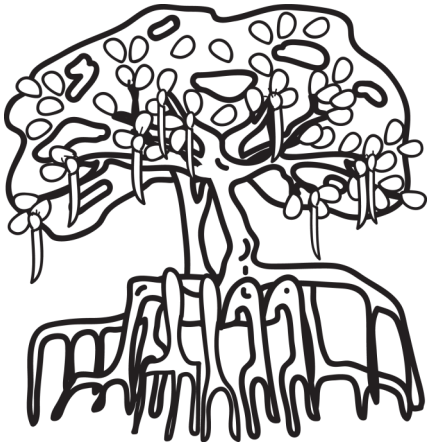
Fruit that animals like to eat

Burs that stick to animal fur

Exploding plants

Gravity drops some seeds
to the ground

Waterproof shells so
they can float



Mangrove seeds grow their own roots, fall to the ground, float in the water, and then take root in mud

Draw and label seven methods of seed dispersal.

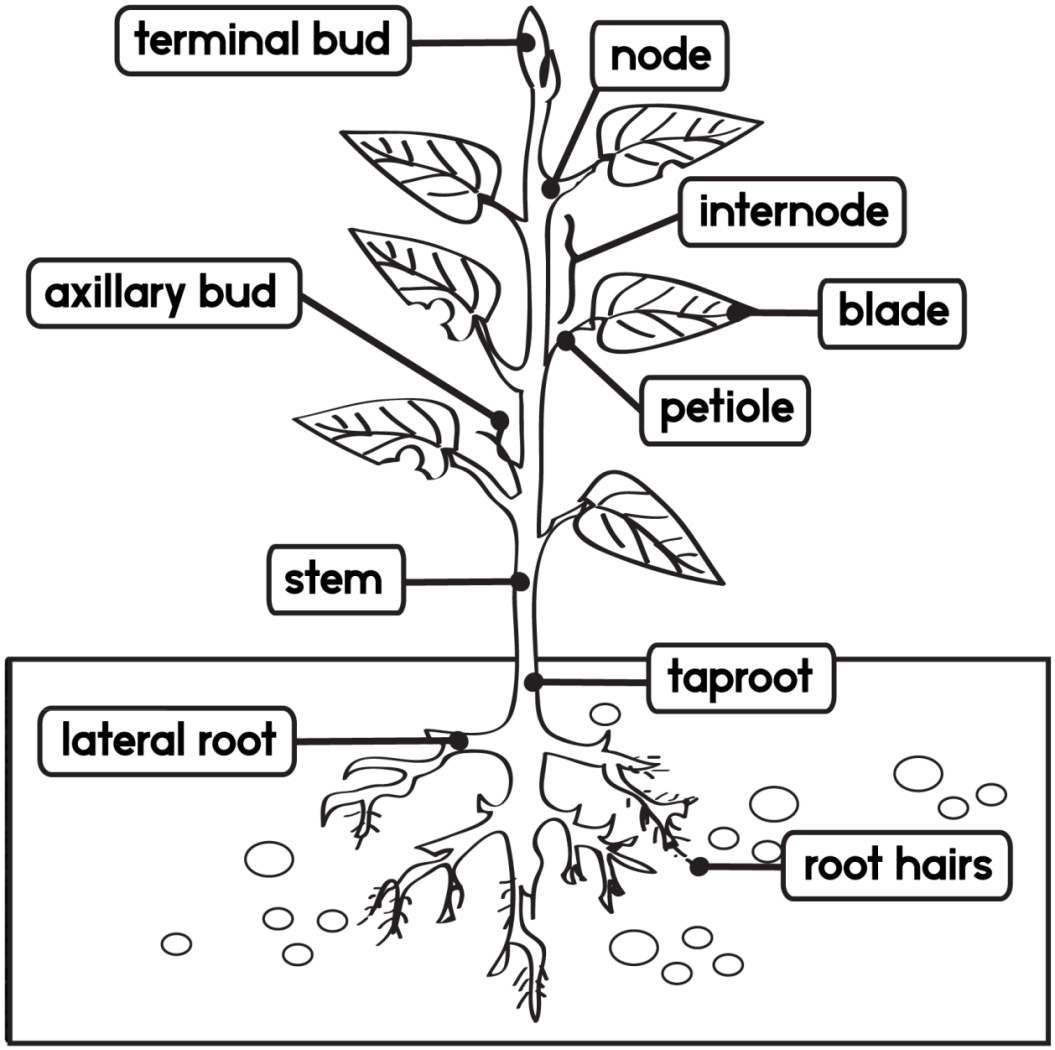
Parts of a Plant

When a seed sprouts a new plant, we call it germination. A fully-grown plant has many parts to help it survive.

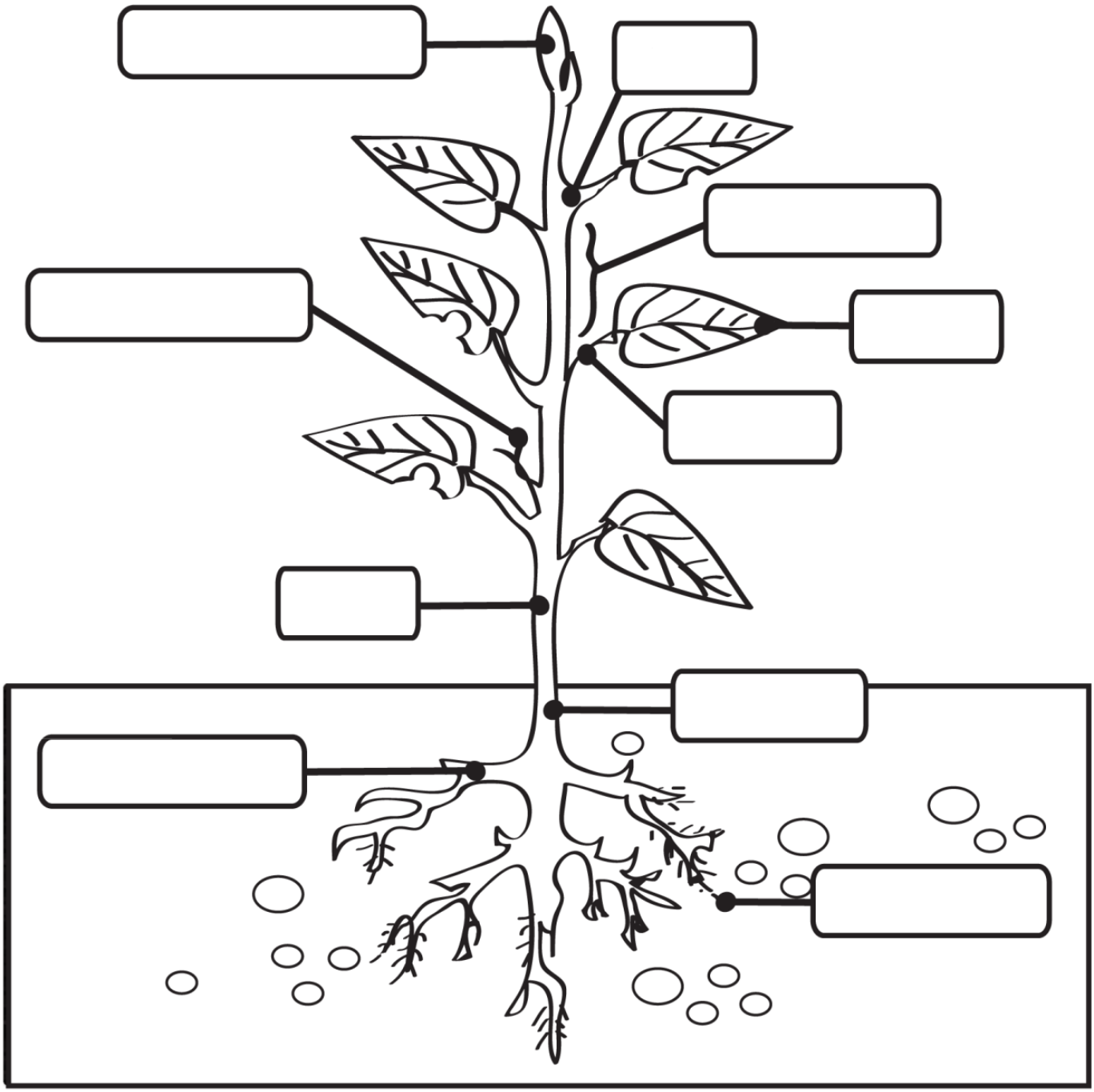
A terminal bud is a bud that forms at the end of a branch or stem. A node is where the leaf joins the stem, and the internode is the space between nodes. The blade is the flat part of the leaf, and the petiole is the thin part of the leaf that attaches it to the stem of the plant .

An axillary bud forms at an angle to the stem. The stem is the stalk that supports the rest of the plant and holds it upright.

A taproot is a root that grows down vertically into the ground, and the lateral roots are the roots that branch off to the side. Root hairs are tiny hair-like growths on the roots that absorb water and minerals from the soil.



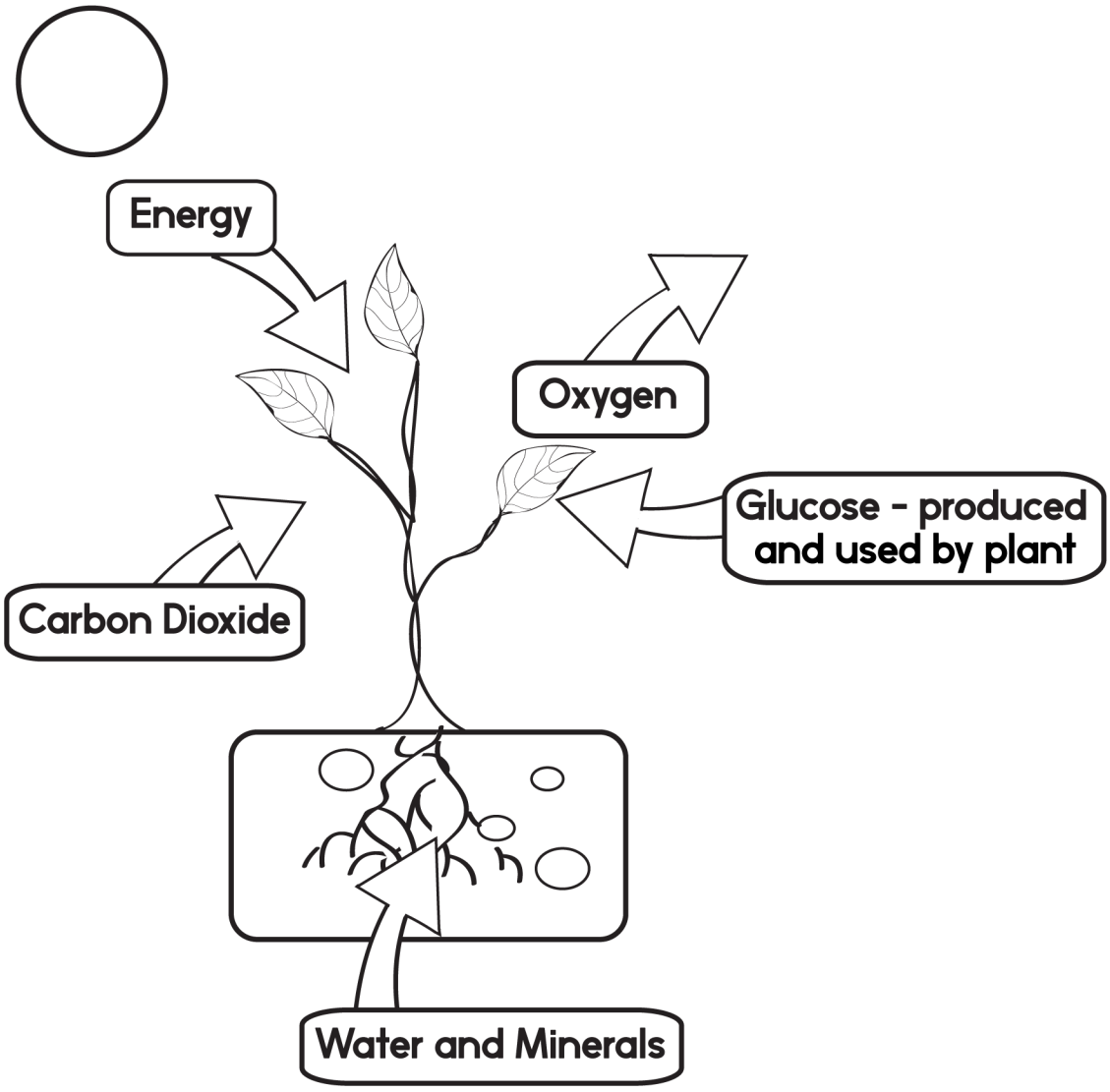
Label the parts illustrated below.



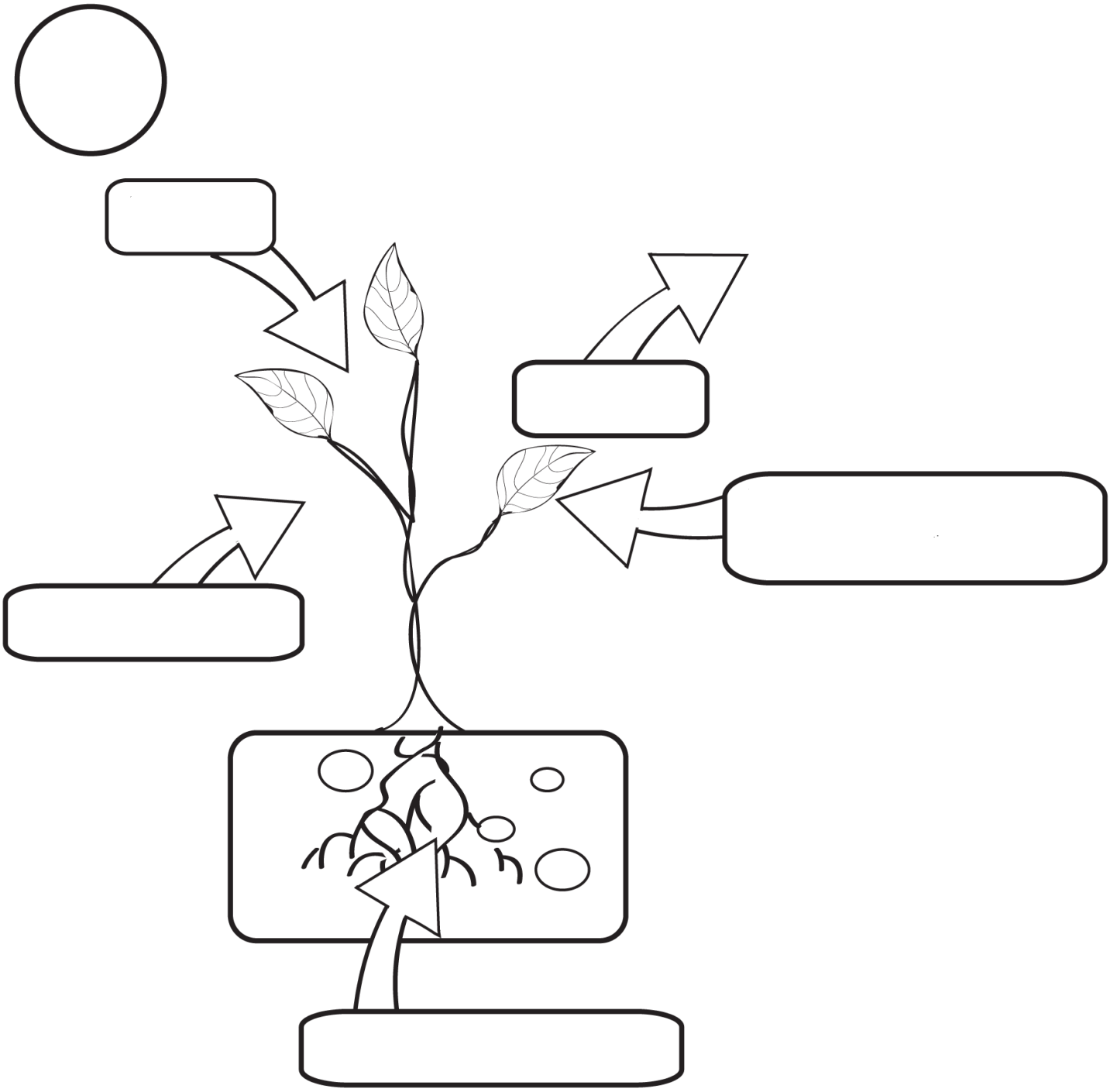
Photosynthesis

The main job of the leaves is to conduct photosynthesis, which is the process most plants use to make their food. The leaves absorb energy from the sun and carbon dioxide from the air. They get water and minerals from the soil thanks to the roots doing their job.

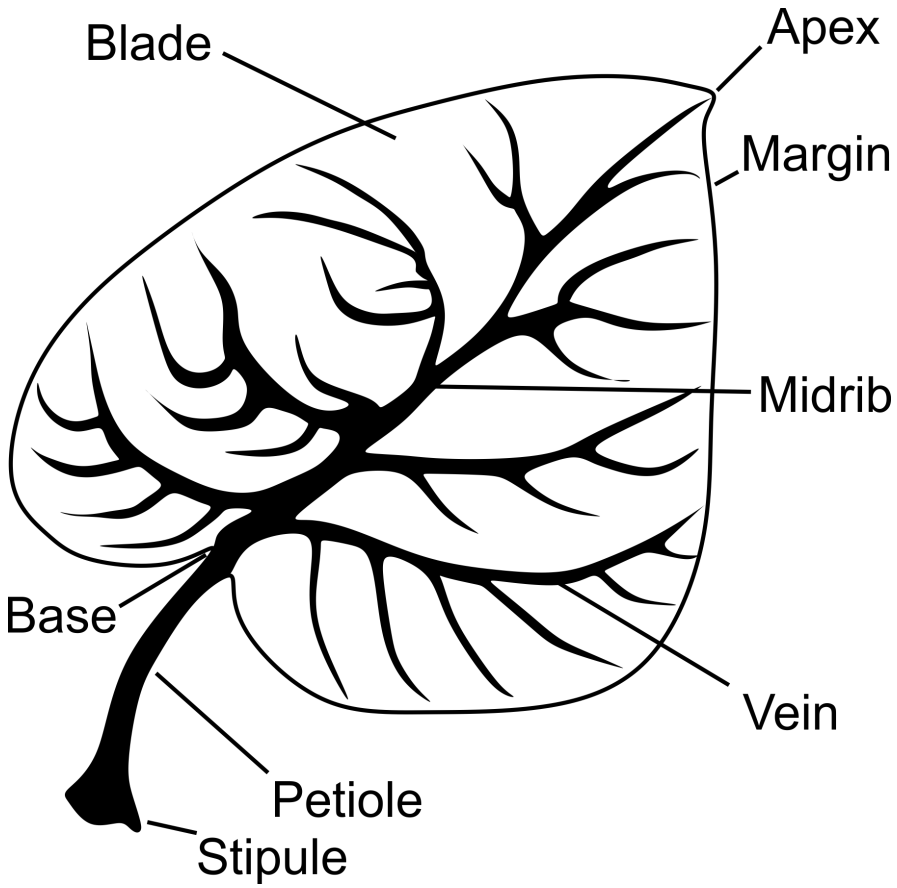
They combine all of this in the chemical process called photosynthesis. When the process is complete, the plant has produced glucose and oxygen. It uses some of the glucose immediately and stores the rest for later. It releases the oxygen into the air. In this way, the plant provides the food it needs and the oxygen humans and animals need to survive.



Label the ingredients needed for photosynthesis as well as the products the process creates.



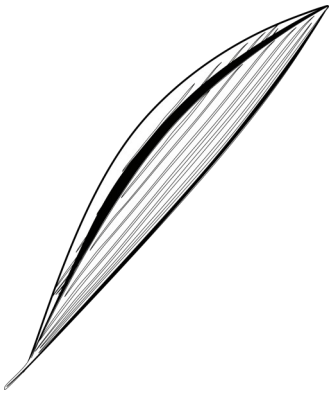
Parts of a Leaf



The veins in leaves come in different patterns.

1. Palmate leaves have several main veins that all come from the same point at the base.
2. Parallel leaves have several large veins running from the base to the tip that are connected by small cross veins.
3. Pinnate leaves have a featherlike pattern in the veins.
4. Reticulated venation is a pattern of veins that looks like a net or a web.

1



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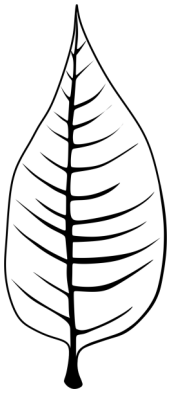

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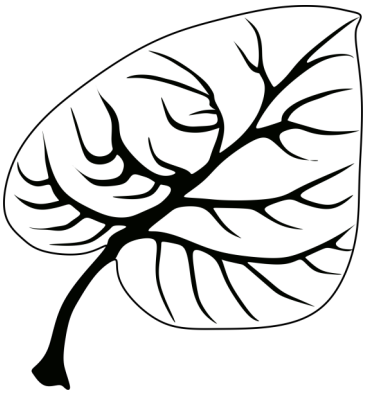
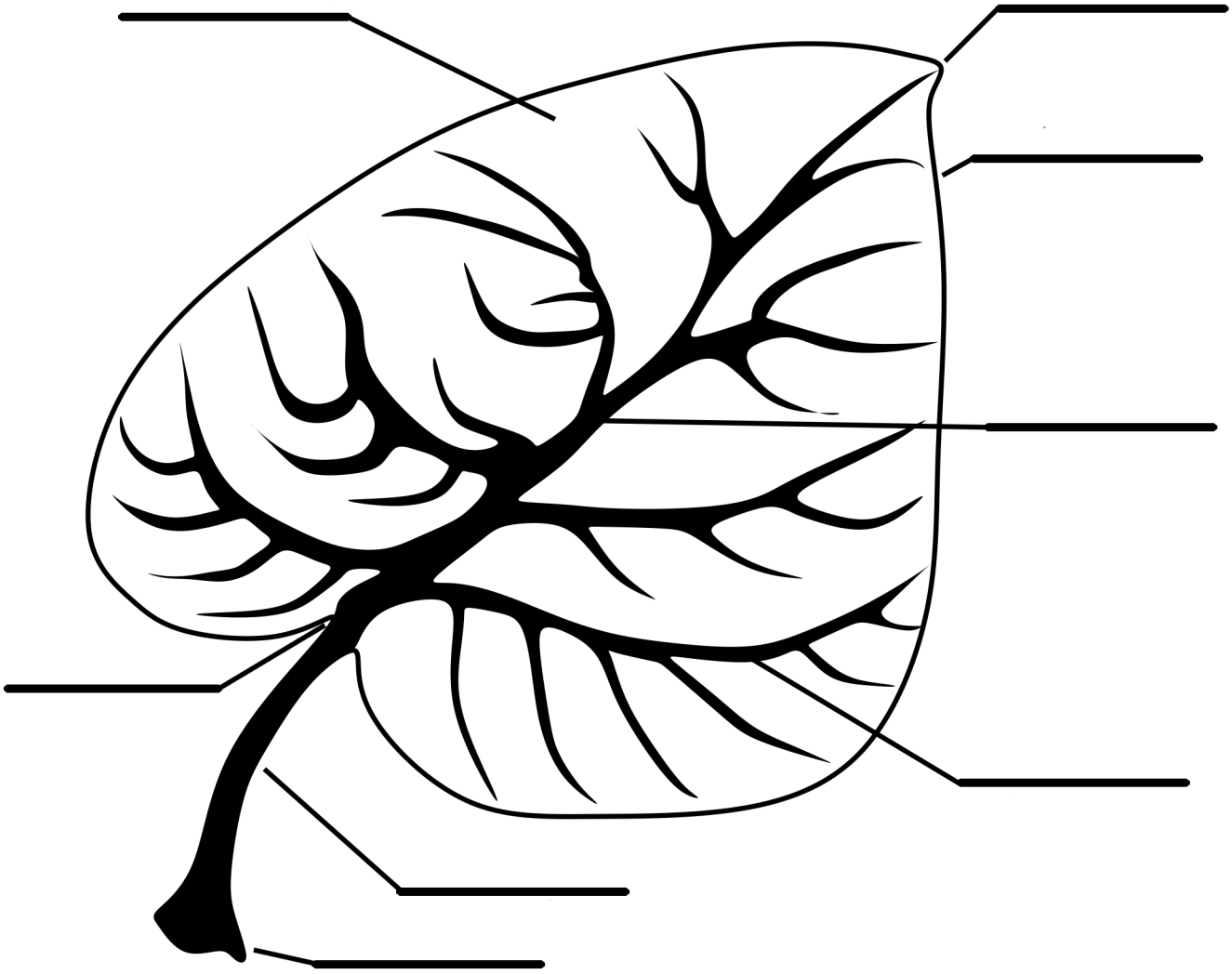


4

Label the parts of the leaf.



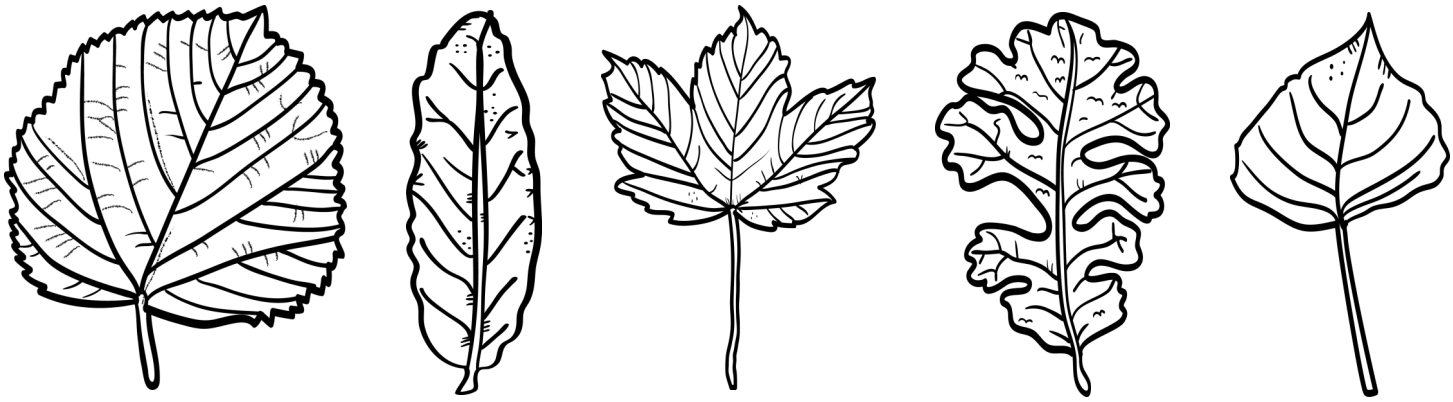
Illustrate four types of vein patterns in leaves.

Palmate	Parallel	Pinnate	Reticulated Venation

Leaf Shapes

Leaves also come in many different shapes.

1. Heart-shaped leaves are shaped like a heart and include lime and foxglove leaves.
2. Lanceolate leaves are shaped like arrowheads and include chestnut and oak leaves.
3. Lobed leaves are leaves with curved or rounded pieces and include maple leaves.
4. Sinuate leaves have wavy edges with many places that dip in toward the center and include oak leaves.
5. Triangular leaves are shaped something like a triangle and include poplar leaves.



1 2 3 4 5

Leaves also have different colors because of pigments.

1. Anthocyanins are red and purple pigments.
2. Carotene is an orange-red pigment.
3. Chlorophyll is a green pigment.
4. Xanthophyll is a yellow pigment.

Color the pigments below if you like.

Anthocyanin

Carotene

Chlorophyll

Xanthophyll

Illustrate and label the five leaf shapes below.

Parts of a Flower

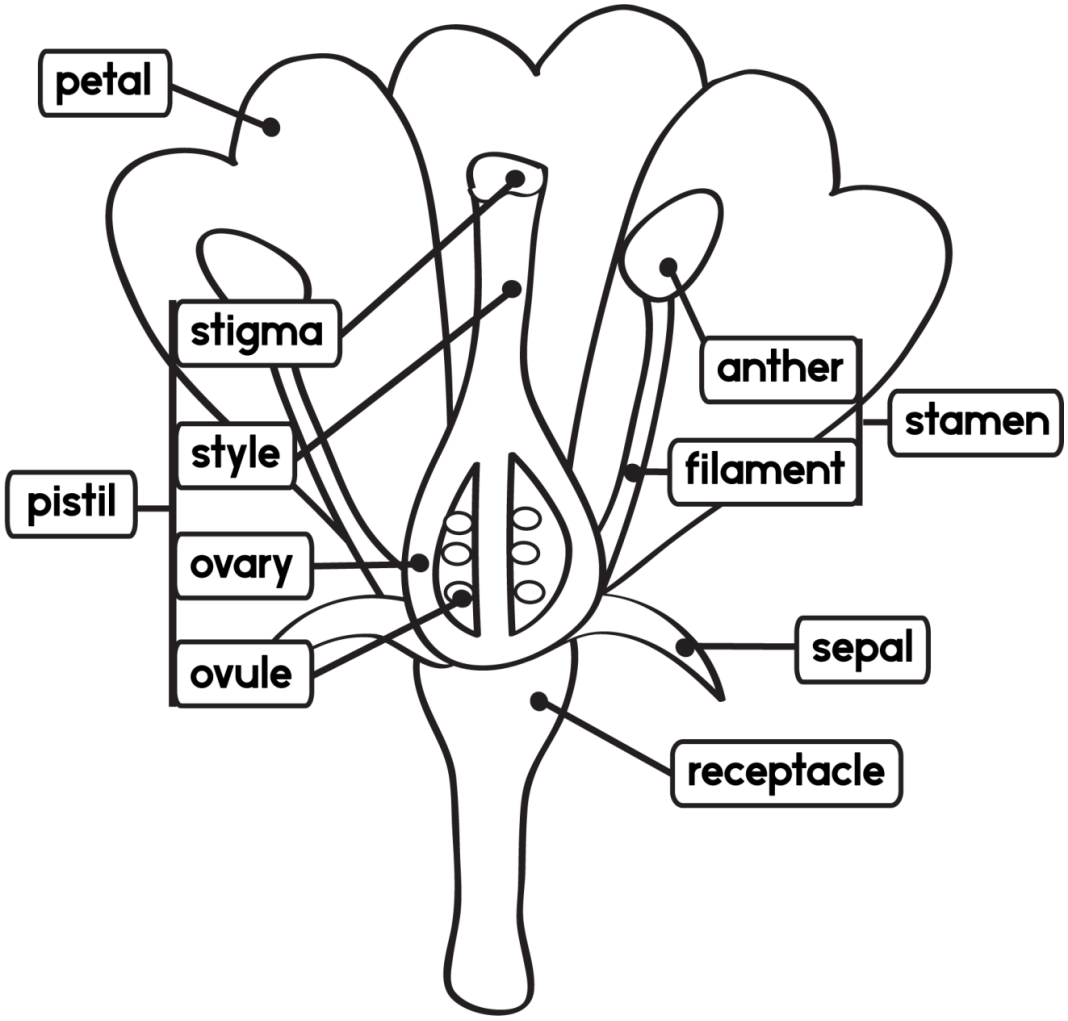
There are different types of plants, but the largest group are flowering seed plants. These plants produce flowers, which enable the seed to be fertilized. A flower may look simple, but it actually has many parts.

The petals are often the largest and most colorful part of the flower.

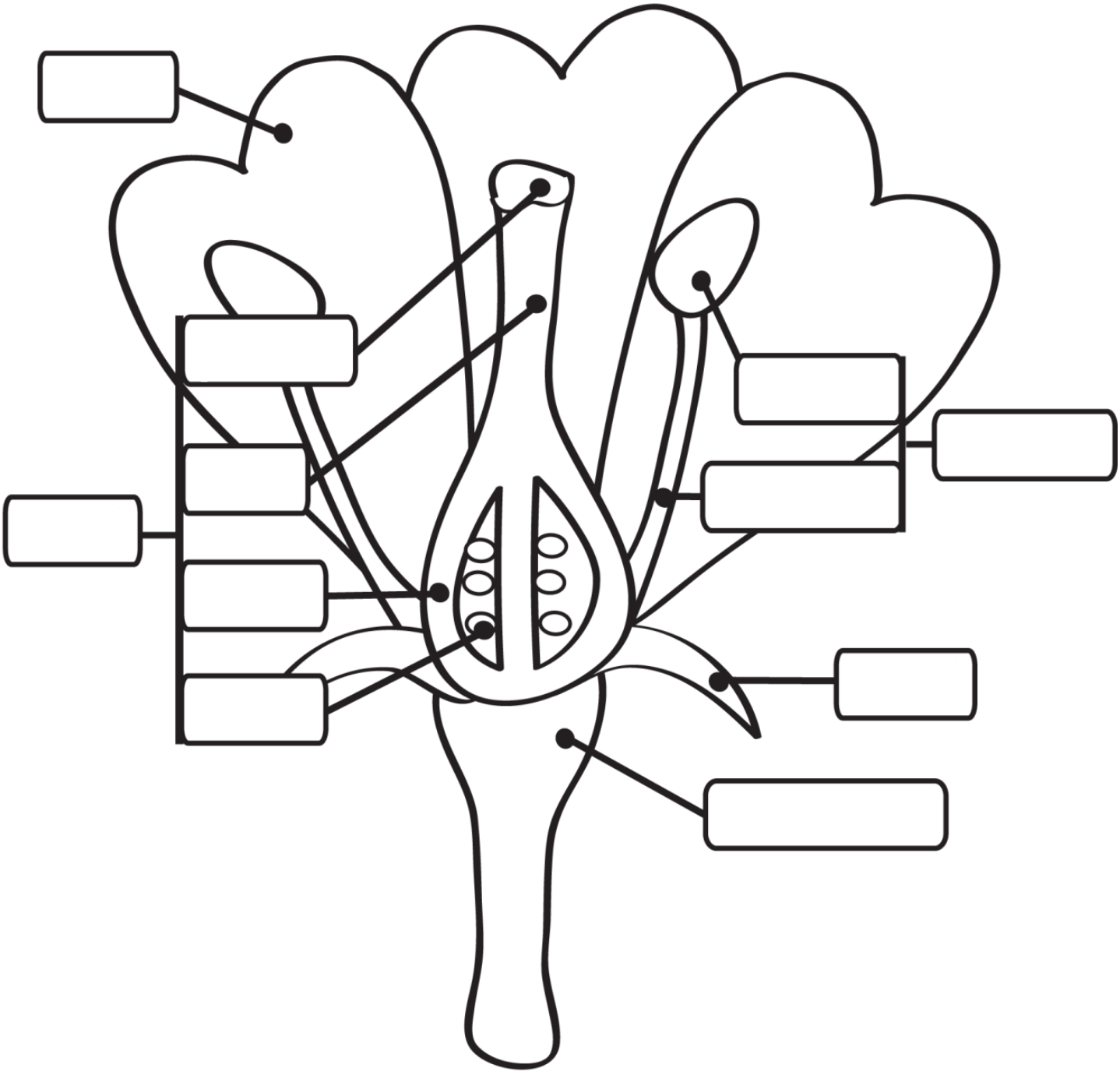
The pistil is made of:
- the stigma at the top
- the style, which is a thin tube
- the ovary, which is a round base
- the ovule, which is where the egg cells form and then become seeds after fertilization

The stamen is made of two parts:
- the anther, which is where pollen is produced
- the filament, which is long and looks like a stalk

The sepals are small structures that look like tiny green leaves. They protect the flower bud. The receptacle is at the end of the flower.



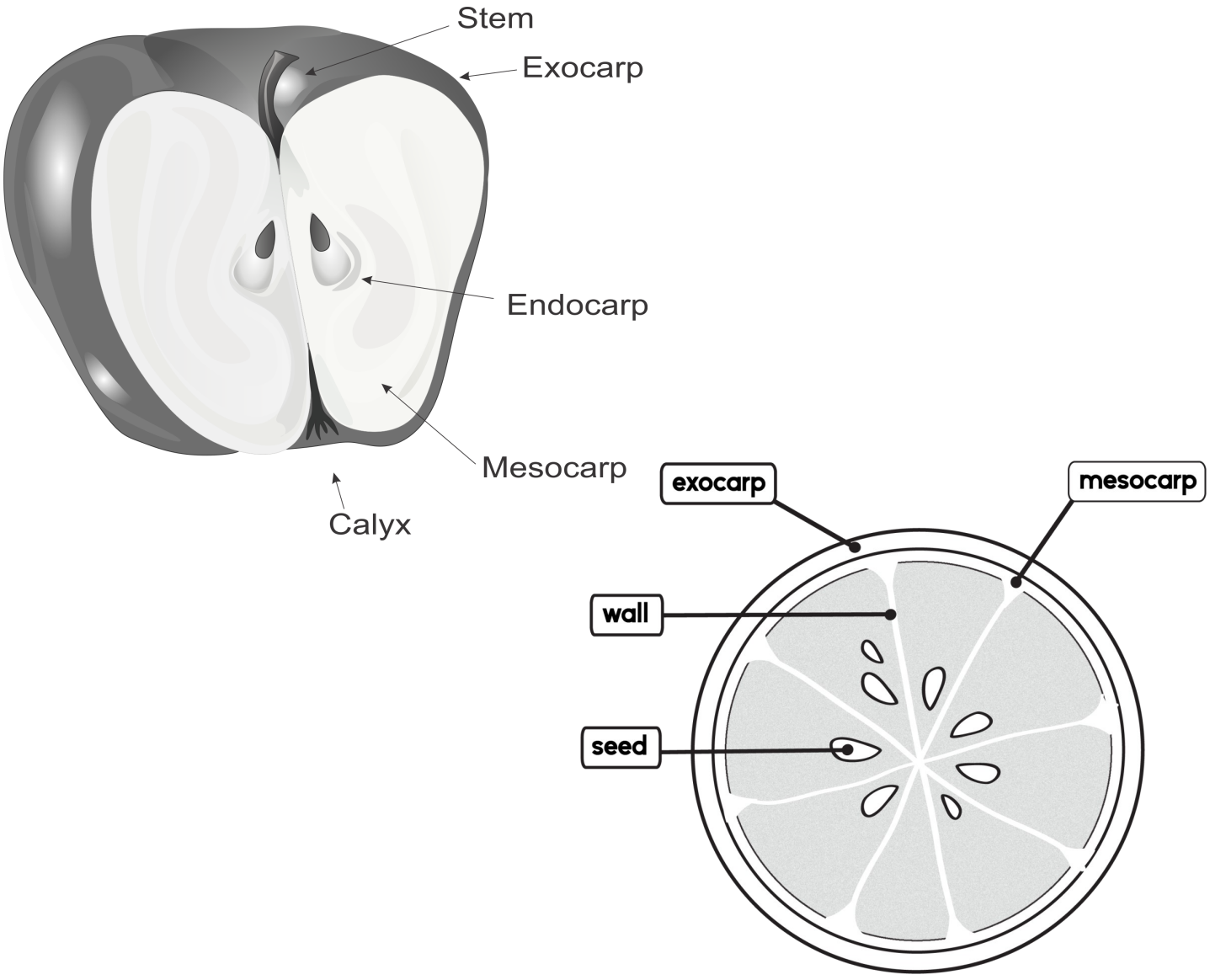
Label the parts of the flower below.



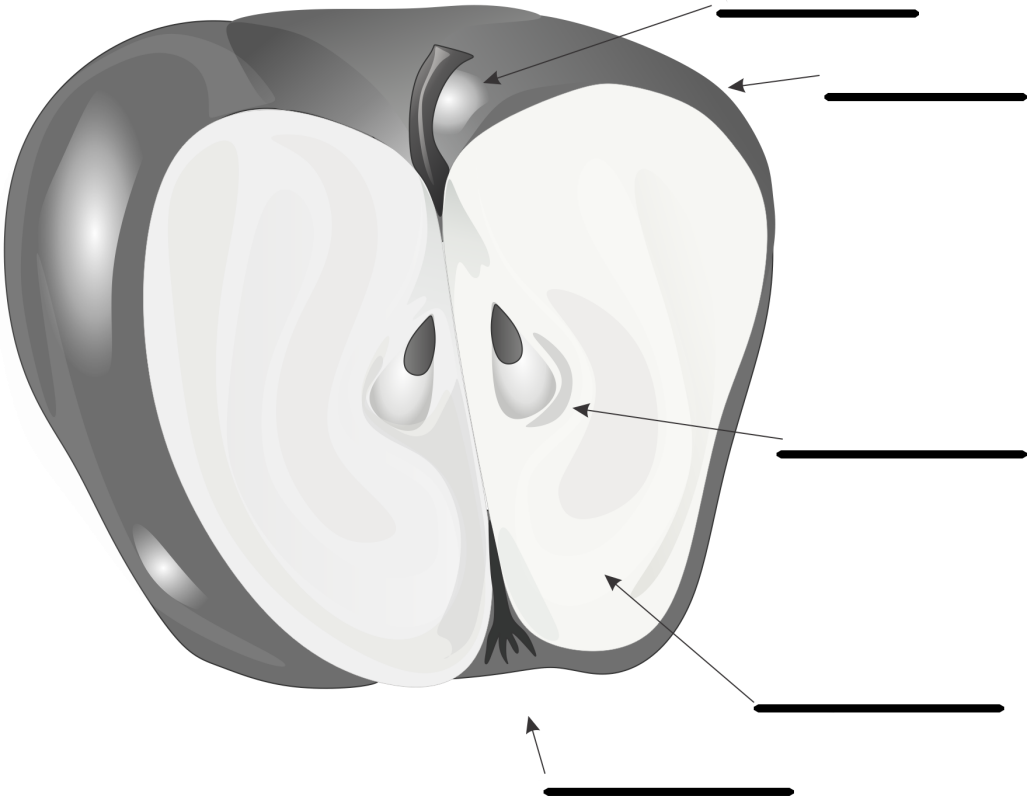
Parts of Fruit

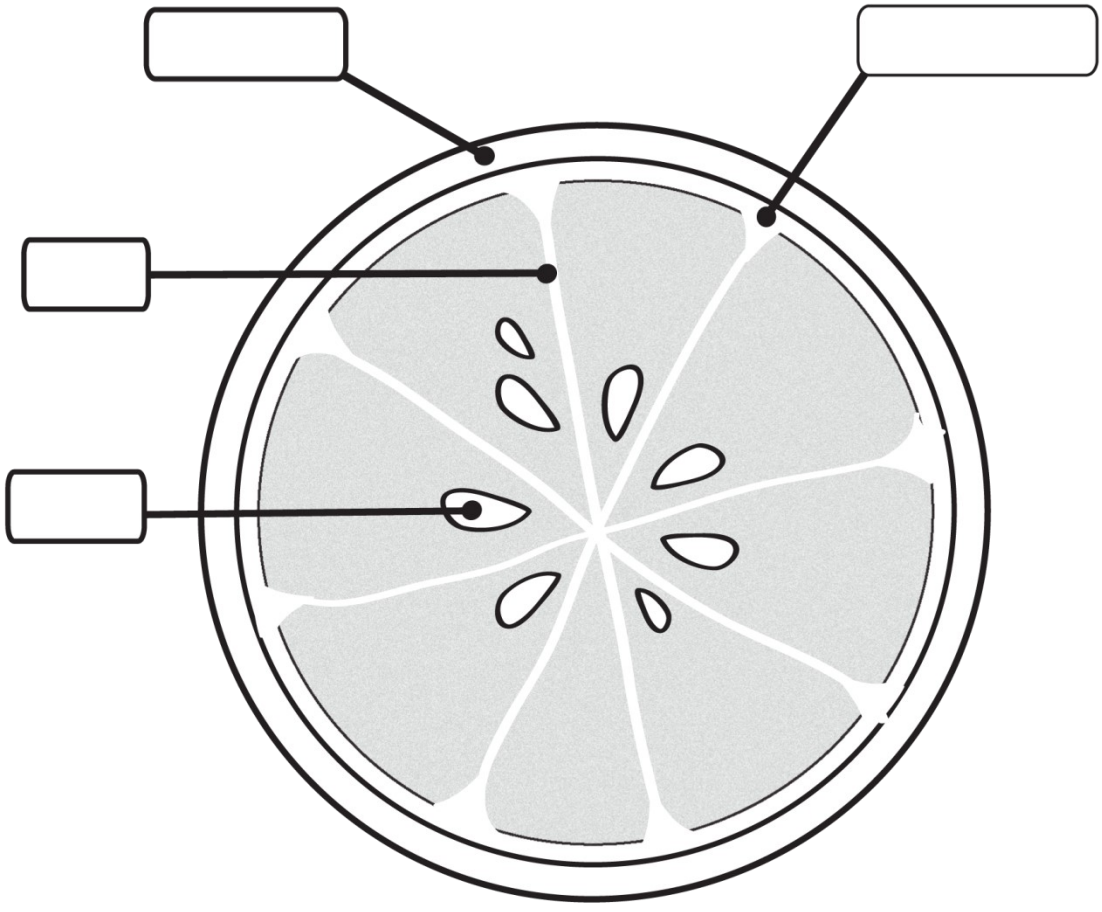
As you know, there are many different kinds of fruit. They don't all have the same parts, but let's look at a few of the common parts.

You can see that both the apple and the orange have an exocarp, which is the outermost layer, and a mesocarp, which is the middle layer. Oranges have walls between the fruit segments. Both fruits have seeds inside (they are not labeled on the apple). The apple shows the stem where it was attached to the tree as well as the endocarp, the inner layer. The apple also shows the calyx, which is part of the flower and includes the sepals of the flower the apple grew from.



Label the parts of fruit below.

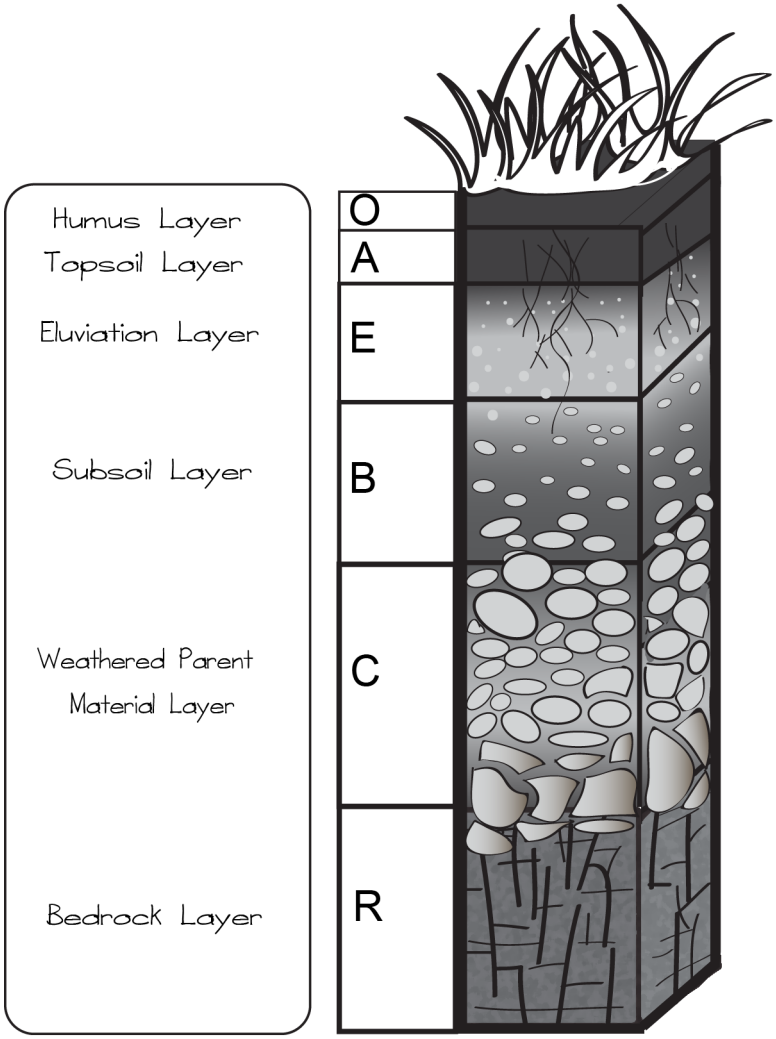




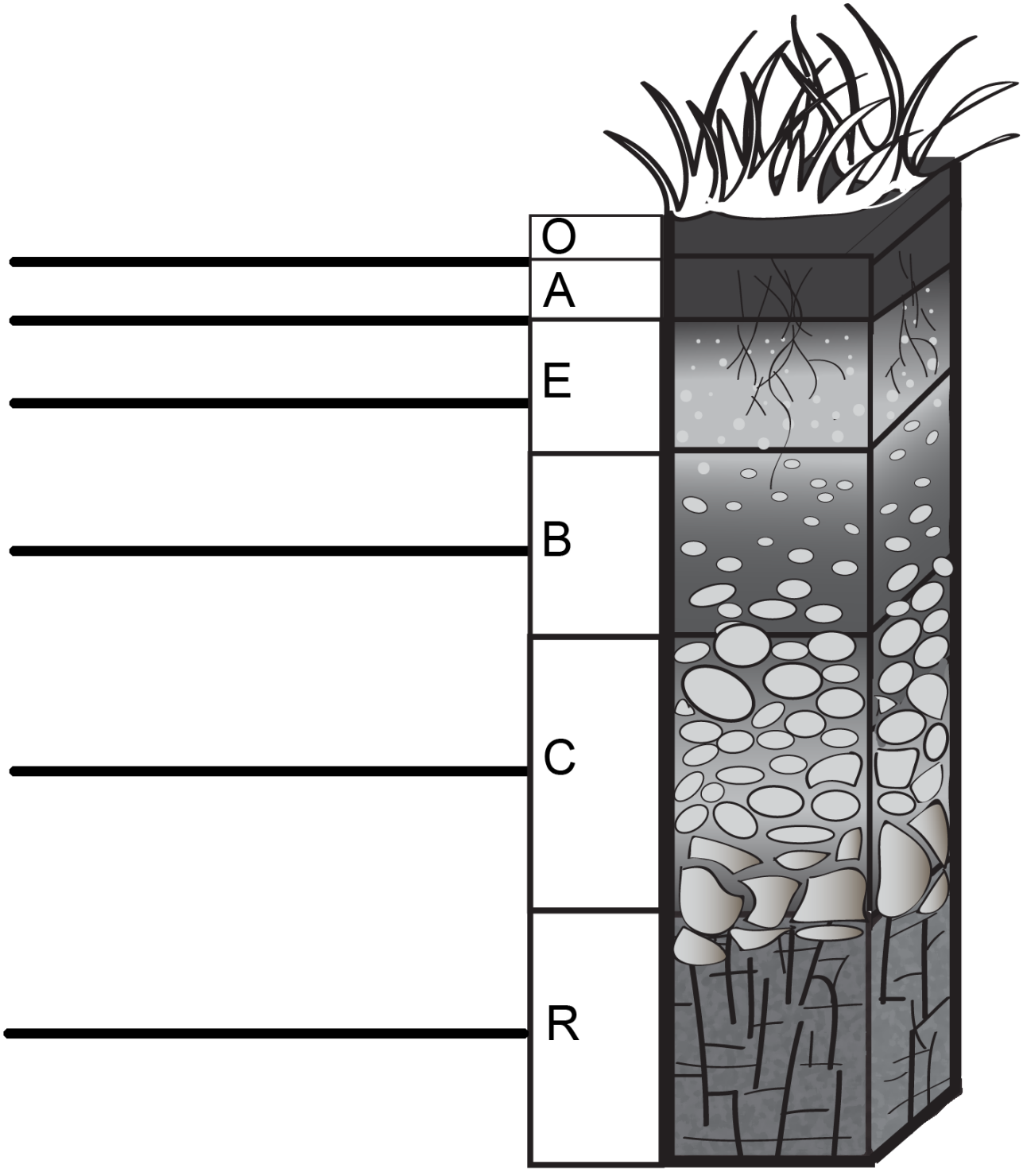
Layers of Soil

Plants need a place to grow, and for many plants, that is soil. Soil is made of layers called horizons. Not all soil has every layer, as conditions vary from place to place.

- O horizon is made of organic materials that have started to decompose, called humus.
- A horizon is made of organic matter and is deep enough for plant roots to grow and take hold. We usually call this topsoil.
- E horizon is made of minerals that have washed down into the soil, but it has less clay than the A horizon. It's called the eluviation layer.
- B horizon is called subsoil and is made of clay and minerals that have been absorbed into the soil.
- C horizon is called the weathered parent material. This is the first layer of soil that was formed as rocks and other substances started breaking down.
- R horizon is the bedrock beneath it all.



Layer the soil horizons illustrated below.



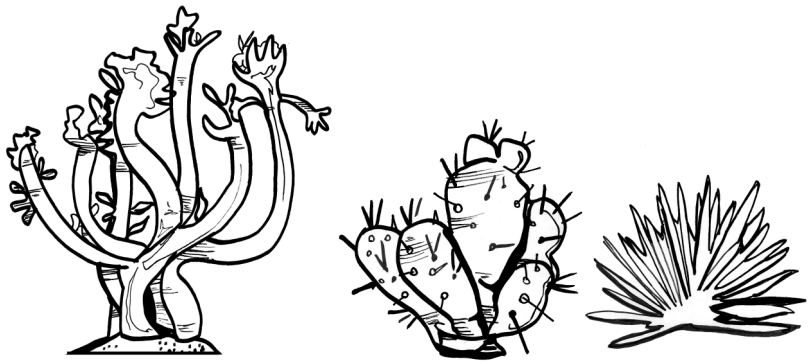
Plants and Their Biomes

All plants need certain conditions to thrive, and certain plants grow best in particular biomes. Take a look at some of the plants and where you might find them.

Coastal

Left to Right: Beach plum, goldenrod, and beachgrass

Desert



Left to Right: Buckhorn cholla, prickly pear cactus, and yucca

Forest

Left to Right: Oak tree, maple tree, and mushrooms

Tundra



Left to Right: Dwarf birch, Arctic poppy, and sedge

Grassland



Left to Right: Black-eyed Susan, buffalo grass, and sagebrush

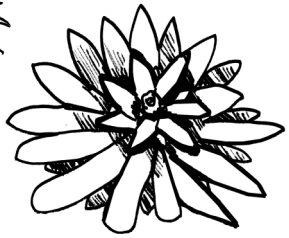
Taiga



Left to Right: Jack pine, fireweed, and lichen

Tropical Rain Forest





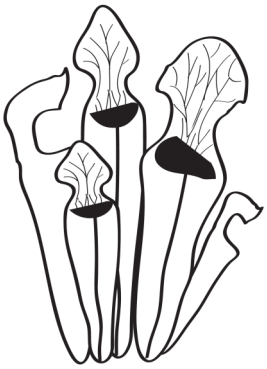
Left to Right: Kapok tree, cacao tree, and bromeliad

Choose four of the plants you just read about and draw them in the space below. Label each plant with its name and biome.

Endangered Plants

Just like animals, plants can become endangered when their numbers in the wild falls too low.

1. The green pitcher plant is found in just a few places in the United States and is infamous for its way of trapping insects and digesting them for food.
2. The *Rosa arabica* is native to the South Sinai region of Egypt.
3. The golden barrel cactus is native to a region of Mexico.
4. The giant rafflesia is thought to be the largest flower on earth, with flowers up to 3 feet (90 cm) wide. It requires a special kind of shrub to live off of and is only found in southeast Asia.



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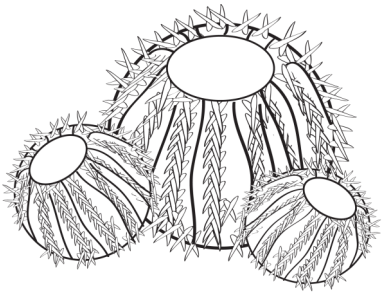

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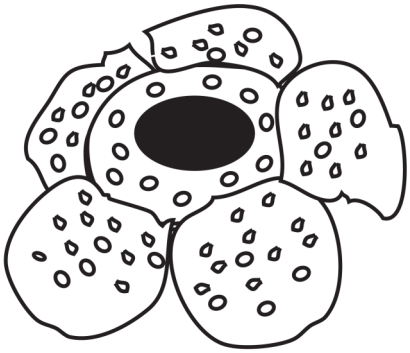
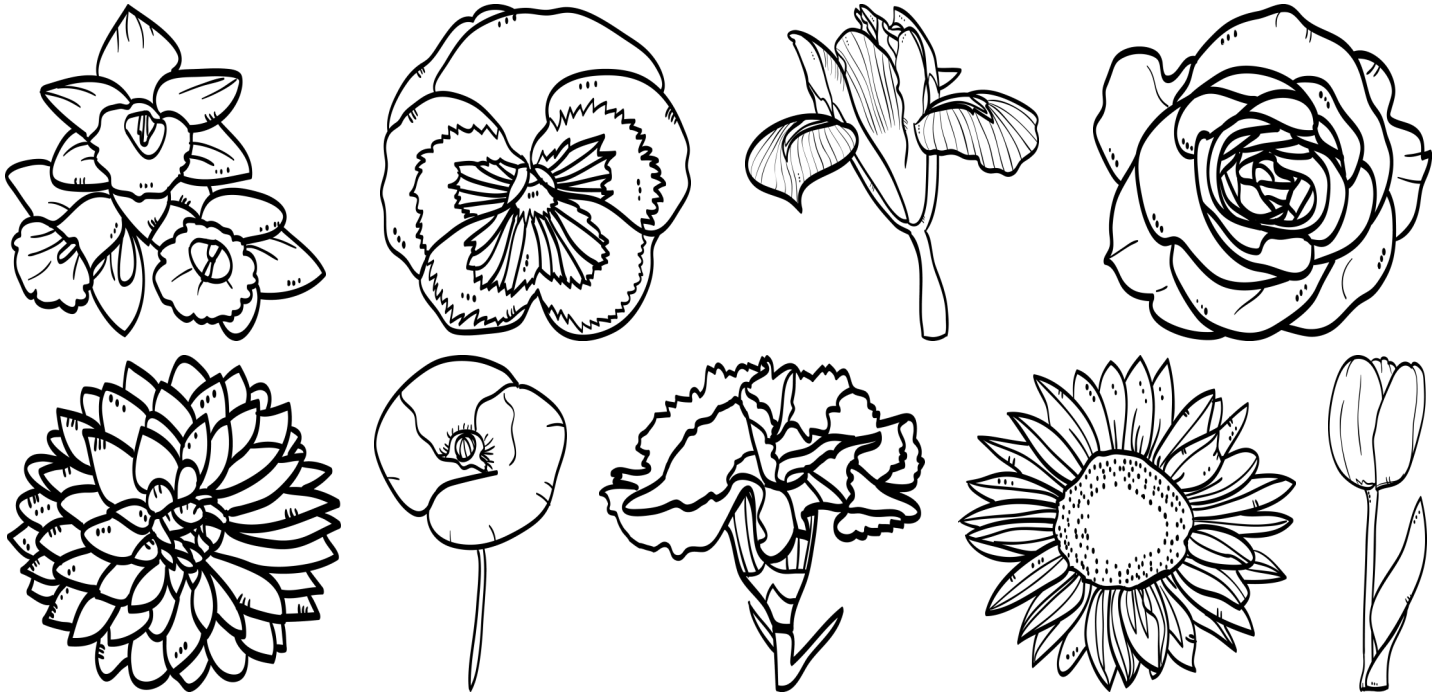


4

Common Flowers

Other flowers are abundant and easy to enjoy.



Top row from left: Narcissus, pansy, iris, and rose
Bottom row from left: Dahlia, poppy, carnation, sunflower, and tulip

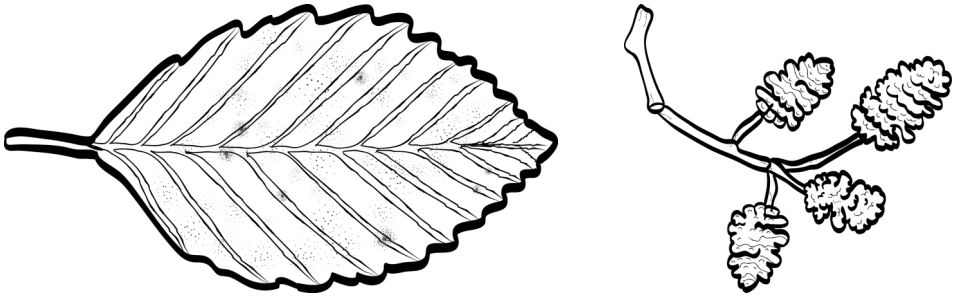
Illustrate and label the four endangered plants studied below.

Illustrate and label four or more common flowers below.

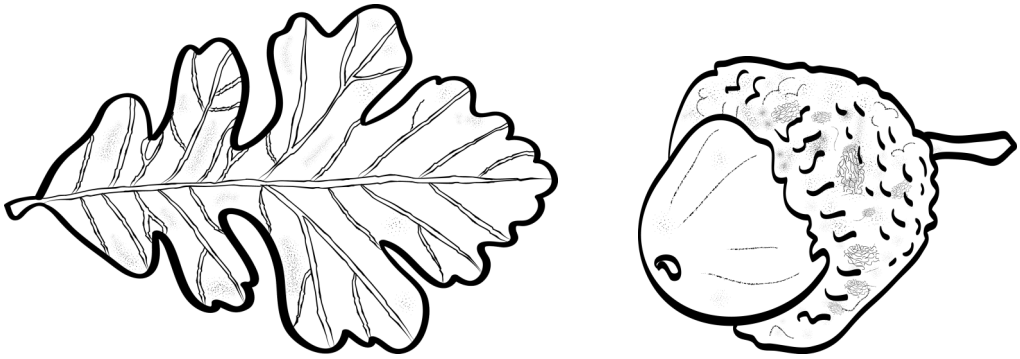
Leaves, Seeds, and Fruit

As we've seen in this unit, leaves, seeds, and fruit of one plant can look very different from those of another plant. As a matter of fact, they are all ways of identifying what kind of plant you are looking at. Observe each pair of leaves and seeds or fruit and then draw them in the space beneath.

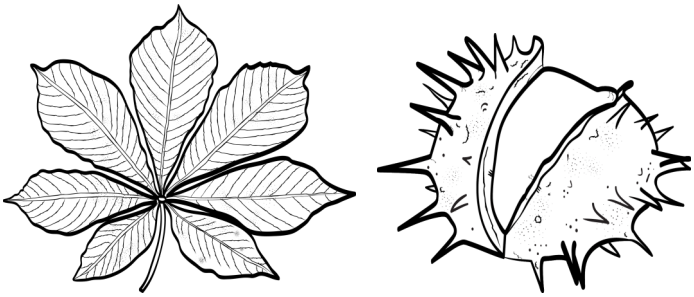
Alder



Bur Oak

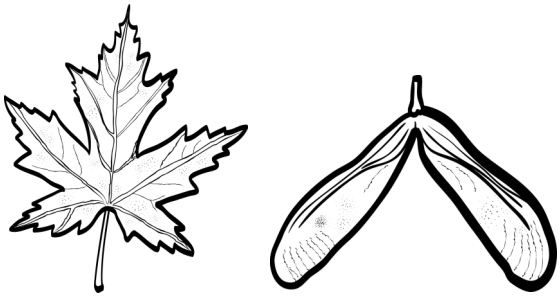


Horse Chestnut

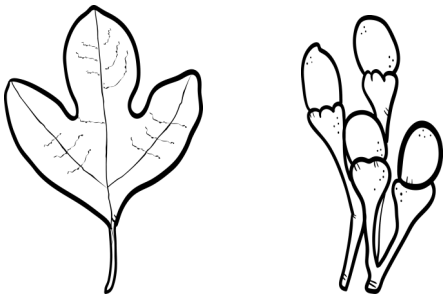


Hawthorn

Silver Maple



Sassafras

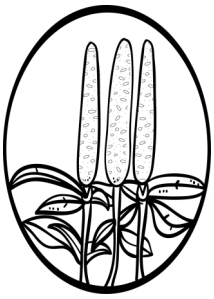
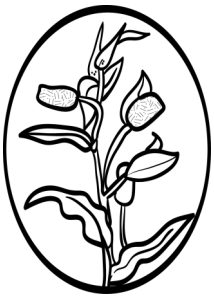


Ways We Use Plants

God has given us a great number of ways we can use plants in our everyday lives. We use the grain from some, the fruit of others, the leaves of certain plants, just the stems of some plants, and the roots of still other plants. Plus, we can use plants for oils, wood, rubber, and many other things.

Using the pictures below, try to brainstorm at least three types of plants that fit into each category. They do not have to match the pictures; the pictures are just hints to get you started.

Grains

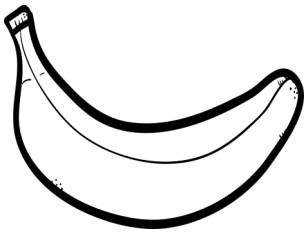




1.

2.

3.

Fruits

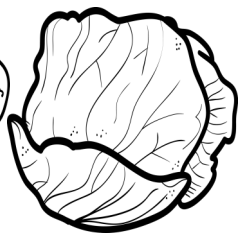
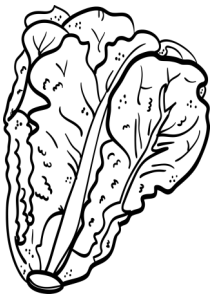



1.

2.

3.

Leaves

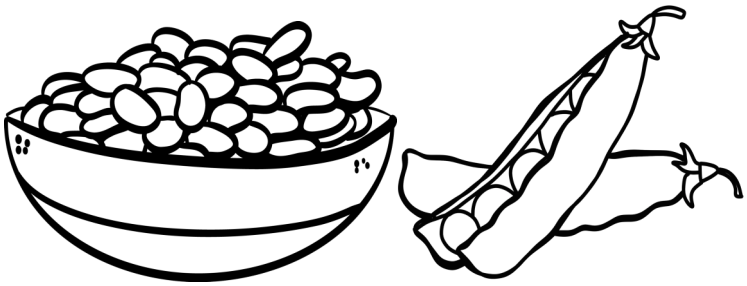




1.

2.

3.

Pulses (Edible Seeds of Certain Plants)



1.

2.

3.

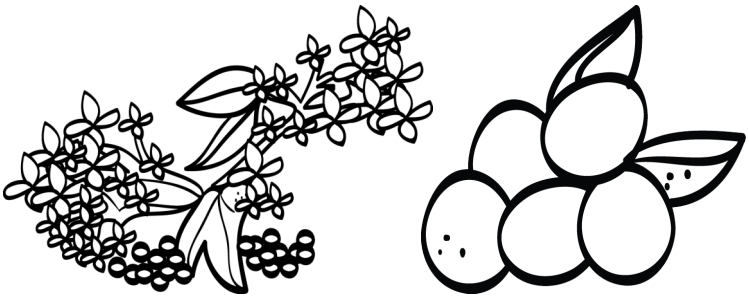
Roots

1.

2.

3.

Oils



1.

2.

3.

Trees and/or Sap, Latex, etc.

1.

2.

3.