

Plants in Our World

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Six Kingdoms of Living Things

Kingdom	Definition	Examples
Animalia	multicellular organisms that obtain nutrients by eating other living things	human ladybug trout
Plantae	multicellular organisms that produce their own food by photosynthesis	ivy moss oak tree
Fungi	multicellular or unicellular organisms that absorb nutrients directly from other living things	mildew mushroom yeast
Protista	multicellular or unicellular organisms that are not plants, animals, or fungi and whose cells have nuclei; some are capable of photosynthesis	algae amoeba paramecium
Archaea	unicellular organisms whose cells lack nuclei; most live in environments that are extremely salty, hot, cold, acidic, or lacking in oxygen	<i>Halobacterium</i> <i>Methanococcus</i> <i>Pyrococcus</i> <i>Sulfolobus</i> <i>Thermococcus</i>
Bacteria	unicellular organisms whose cells lack nuclei; some are capable of photosynthesis; distinguished from Archaea by their chemical makeup	cyanobacterium E. coli lactobacillus salmonella staphylococcus streptococcus

▲ **Figure 28** Scientists categorize living things on Earth into six kingdoms.

Levels of Classification

Animalia	Kingdom	Plantae
Chordata	Phylum or Division	Magnoliophyta
Mammalia	Class	Magnoliopsida
Carnivora	Order	Sapindales
Felidae	Family	Aceraceae
<i>Felis</i>	Genus	<i>Acer</i>
<i>silvestris</i>	Species	<i>saccharum</i>
<i>Felis silvestris</i>	scientific name	<i>Acer saccharum</i>
cat	common name	sugar maple

▲ **Figure 29** This chart shows the different levels of classification for a cat and a sugar maple tree.

Glossary

A page number in boldface type indicates the page on which the word is defined in the text.

accessory pigment plant chemical other than chlorophyll that also absorbs light energy (4)

angiosperm vascular, flowering plant whose seeds develop inside the ovary, which matures into a fruit; monocots and dicots (15, 18–20)

asexual reproduction process by which a single organism produces an offspring that is genetically identical to the parent (7, 8)

bark outside part of a woody stem, made up of the phloem, cork cambium, and cork layers (8, 15, 21)

cambium one- or two-cell-thick layer of tissue in a woody stem, between the xylem and the phloem, that produces new cells (15)

cell wall rigid structure surrounding the cell membrane of plant cells that provides support (2)

chlorophyll green pigment found in the chloroplasts of plant cells that absorbs light energy for use in photosynthesis (3, 4, 10, 12)

chloroplast structure in a cell that contains chlorophyll; site of photosynthesis (2, 3, 9–11, 14)

chromosome threadlike structure of protein and genetic material in the cell nucleus that conveys hereditary characteristics from one generation to the next (6)

cone reproductive structure that carries and protects the seeds of a gymnosperm (12, 13, 15–17, 22)

consumer organism that gets food by eating other organisms (2)

cork outermost layer of a woody stem, made up of protective cells (15)

cork cambium layer of a woody stem between the phloem and the cork that produces new cork cells (15)

cotyledon tiny, leaflike structure found in angiosperm embryos; provides food for the sprouting plant until it can perform photosynthesis (18)

dicot (shortened form of *dicotyledon*) a plant whose seeds contain two cotyledons; one of the two classes of angiosperms (18, 19)

diploid cell with the full number of chromosomes that is usual for its species (6, 8)

division level of organization below the kingdom *plantae* (plants) (2); **phylum** is the level of organization below the kingdoms *animalia*, *fungi*, *protista*, *archaea*, and *bacteria* (Figure 29)

dormancy state in which a plant's life processes slow down (5, 13)

egg female gamete (6, 8, 10, 12, 17–20)

embryo earliest stage of development of an organism; occurs after the zygote begins cell division but before germination, or rapid growth, begins; a young sporophyte (6, 8, 13, 17, 18, 20)

ethnobotanist scientist who studies the way people use the plants that grow in their area (21)

fertilization process by which a sperm cell joins with an egg cell, forming a zygote (6, 8, 18)

flower plant part that contains the reproductive structures of an angiosperm (6, 8, 13, 16, 18–20)

frond leaf of a fern (12)

fruit in angiosperms, a mature, ripened ovary containing the seeds (16, 18, 20, 22)

gamete haploid reproductive cell (sperm or egg) that, when joined with a gamete of the opposite sex, will form a diploid cell, or zygote, which can grow into a new organism (6–8)

gametophyte stage in a plant's life cycle that produces gametes (8–12, 19)

genus group of closely related species (2)

germination early stage of growth of a plant embryo into a new plant (13, 17, 19, 20)

grafting process of attaching part of one plant to the root or stem of another plant so that the two grow together (8)

gravitropism movement or growth of a plant in response to gravity (6)

gymnosperm vascular, nonflowering plant whose seeds are not enclosed in an ovary but rather form on the outside of a leaf or other structure, such as a cone (15–17)

haploid cell with only half the number of chromosomes that is usual for its species (6–8)

kingdom one of the six major classifications of living things (2)

layering process of making a plant reproduce asexually by burying a part of it to cause new shoot and root growth and then separating the new plants from the parent (8)

leaf plant structure that is the primary site for photosynthesis, respiration, and transpiration (3–5, 7, 9–14, 15, 16, 18–20)

monocot (shortened form of *monocotyledon*) plant whose seeds contain only one cotyledon; one of the two classes of angiosperms (18, 19)

nonvascular plant plant without vascular tissue that instead moves water and other substances directly from cell to cell (5, 9–11)

offspring new individual organism that results from sexual or asexual reproduction (6, 7)

ovary in the flowers of angiosperms, female reproductive structure that contains the ovule; matures into a fruit (18–20)

ovule in gymnosperms and angiosperms, the female gametophyte that produces egg cells; matures into a seed (6, 8, 17–20)

petal outer, often colorful part of a flower that protects the reproductive structures inside the flower (19, 20)

phloem vascular tissue through which food travels to all parts of a plant (11, 15)

photosynthesis process by which green plants make food using light energy to combine carbon dioxide and water to form the simple sugar glucose and oxygen (3–5, 9, 11–14, 18)

phototropism movement or growth of a plant in response to light (6)

pigment substance that reflects a particular color by absorbing other colors of light; the green pigment chlorophyll reflects green light (4)

pistil female part of the flower of an angiosperm; consists of the ovary, style, and stigma (19)

pith central part of a woody stem, made up of spongy food storage cells (15)

plant multicellular organism that produces its own food by photosynthesis, does not have a nervous system, and does not move from place to place (2–15, 17–22)

pollen male gametophyte stage of a seed plant (6, 8, 17, 19, 20)

pollination transfer of pollen from one plant to another, often by wind or insects (17, 19, 20)

producer organism that makes its own food (2)

regeneration type of asexual reproduction in which a piece of a plant separates and grows into a new plant (7)

respiration process by which living things use oxygen to break down stored glucose into carbon dioxide and water, which releases energy (3, 4)

rhizoid thin, rootlike structure that anchors some simple plants (9, 10)

rhizome horizontal, underground stem that sends out roots and shoots (7, 9, 11, 12)

root plant structure that takes in water and nutrients and anchors the plant (3, 5–9, 11–15, 19, 20, 22)

runner horizontal, aboveground stem that branches off the main stem, grows along the ground, and sends out roots and shoots (7)

seed plant structure that contains a plant embryo and food for the embryo (8, 11, 13, 15–20, 22)

seed coat outer layer of tissue that protects a seed (13)

sepal leafy structure that helps protect a developing flower before it opens (19)

sexual reproduction process by which a male reproductive cell and a female reproductive cell unite to produce a zygote that is genetically different from both parents (6, 8)

species within a genus, a group of closely related organisms that can breed and produce offspring that can also reproduce (2, 6, 11, 13, 15–18, 21)

sperm male gamete (6, 8, 10, 12, 17, 20)

spore reproductive cell that—without joining with another cell—develops into the gametophyte stage in the life cycle of a plant; produced by the sporophyte stage (7, 8, 10, 12, 17, 20)

sporophyte stage in a plant's life cycle that produces spores (8–13, 20)

stamen male part of the flower of an angiosperm; made up of the anther and the filament (19)

thigmotropism movement or growth of a plant in response to contact (6)

transpiration loss of water vapor by plant parts, most often the leaves (5, 14)

tropism movement or growth toward or away from a change in a plant's surroundings (6)

vascular bundle strand of tissue that contains both xylem and phloem (11, 14, 18)

vascular plant plant that contains vascular tissue, which is made up of tubelike structures that carry materials to all the other cells in a plant (5, 11–13)

xylem vascular tissue through which water travels to all parts of a plant (11, 15)

zygote diploid cell formed by the joining of two gametes (usually a sperm and an egg); a fertilized egg (6, 8, 10, 20)