



Earth's Birthday Project

Seeds, Flowers, Fruits, Buds: Background for Teachers

1 Word Wall

Seeds Grades K–6

Cotyledon (caw-duh-LEE-dun) – a part of the seed that stores nutrients (food) and will become a seed leaf when the seed germinates

Dormant – resting during the winter, as buds and seeds do

Embryo – a new, undeveloped plant contained in a seed

Germinate – begin to grow after a period of dormancy (To germinate, a seed needs water and oxygen; it also needs to be at the right temperature and exposed to the right amount of light.)

Hilum (HIGH-lum) – the scar that marks the place where a seed was attached to a seed pod

Seed – the part of a plant that contains the embryo and nutrients that will help it grow

Seed leaf – a leaf-like part of the seed sprout that grows on the stem just below the first true leaves

Seed coat – the outer covering of the seed, also called the *testa*

Sprout – a young plant that has just emerged from its seed

Grades 4–6

Epicotyl (EH-puh-cawd-ul) – the part of the embryo that will develop into the plant's stem and its first true leaves

Radicle – the part of the seed that will become the plant's first root (The radicle is connected to the base of the tiny, rudimentary stem of the epicotyl.)

Flowers Grades K–6

Ovary – the ovule-bearing part of a plant that ripens into a fruit

Ovule (AHV-yool) – the egg that develops into a seed

Petals – soft, often colorful parts of a flower that sometimes look like leaves

Pistil or *Carpel* – the female part of a flower

Pollen – tiny, powdery particles (grains) formed by the stamen (male part of the flower)

Sepals – green, petal-like parts below the petals that formed the flower's bud cover

Stamen – the male part of a flower

Fruits Grades K–6

Berry – the simplest kind of fleshy fruit, in which seeds are imbedded directly in the pericarp (chile, tomato, bell pepper, grape) (Cucumbers, watermelons, and citrus fruits are modified berries; raspberries and blackberries are aggregate fruits made up of many tiny berries.)

Fruit – the ripened ovary or ovaries of a flower

Simple fruits are formed from a single flower ovary; they may be fleshy (apple, peach, pear, bell pepper, blueberry) or dry (nut, bean); and they may contain one or more (often many) seeds.

Aggregate fruits are formed from a compound flower containing many ovaries (raspberry, blackberry).

Nut – a dry, one-seeded fruit with a woody pericarp (acorn, beechnut)

Pericarp (PAIR-ih-carp) – another name for fruit; the ripened wall of a flower’s ovary, which may be fleshy (orange, apple, banana, melon), dry (bean, pea), or hard (nut, sunflower seed)

Pod – a dry pericarp that contains several seeds often lined up in a row (bean or pea pod, peanut shell, locust or catalpa pod, milkweed pod)

Grades 4–6

Achene (uh-KEEN) – a small, dry fruit with one seed and a thin pericarp (sunflower seed, dandelion seed)

Drupe (DROOP) – a fleshy fruit with a thin exocarp and a hard endocarp that contains a single seed (cherry, peach, plum, olive, almond, pistachio, coconut, pecan, walnut)

Hypanthium (high-PAN-thee-um) – the fleshy layer surrounding the pericarp of a pome (The hypanthium develops from the bases of the flower’s petals and sepals.)

Pericarp layers

Exocarp (EX-o-carp) – the outermost layer of the pericarp, a peach’s peel, an orange’s zest (also called the citrus flavedo), a banana’s peel, or a watermelon’s rind

Mesocarp (MEH-zuh-carp) – the middle layer of the pericarp, a peach’s flesh, the white material under the orange’s zest

Endocarp (EN-duh-carp) – the inner layer of the pericarp, which directly surrounds the seeds; the orange’s sections, or the hard, wrinkled “shell” around a stone fruit’s seed (peach, plum, pecan, walnut); in some fruits, the mesocarp and endocarp are barely distinguishable (watermelon)

Pome (POHM) – a fleshy fruit with a tough core that usually has five seeds, in which the pericarp is encased by an additional layer, called the hypanthium (apple, pear, quince)

Buds Grades 4–6

Annual growth scar or *terminal bud scale scar* – the place on the twig where a terminal bud was located (The space between these scars is one year’s growth.)

Bud – undeveloped leaf or flower

Flower scar – the place where a flower was attached to the twig

Lateral bud – a bud located on the side of the stem or twig at the base of a leaf

Leaf scar – the place where a leaf was attached to the twig

Lenticel (LEN-tih-cel) – a small hole or *pore* on a stem or twig through which air is absorbed

Pith – the inner part of the stem or twig; may be in the shape of a star, triangle, or circle and may be chambered

Scales – modified leaves that cover and protect buds of woody plants in cold climates

Terminal bud – the bud located at the tip of the stem or twig

Bud Covers Grades 4–6

Hairy – the scaly or naked bud is protected by hairs

Naked – the bud is not covered by scales

Scaly – scales cover and protect the embryonic parts of the bud

Kinds of Plants with Seeds Grades 4–6

Gymnosperms – plants that don't produce flowers and fruits; plants without ovaries, whose seeds are “naked”; *conifers*

Cone – the part of a conifer that contains reproductive structures

Female cone – (seed cone) the woody cone that contains ovules that become seeds when pollinated (The juniper's female cone is called a *juniper berry*.)

Male cone – (pollen cone) small, papery cone that contains pollen; usually clustered below the female cones or on a separate plant

Scales – the individual plates of a cone

Angiosperms – plants whose seeds are enclosed in fruits that develop from the ovaries in flowers

Monocot – a subclass of angiosperm with one cotyledon in each seed and leaves with parallel veins (corn, lily, grass)

Dicot – subclass of angiosperm with two cotyledons in each seed and leaves with a midrib and branching veins (bean, sunflower, cottonwood tree)

2 Fruit, Flower, Seed Functions

Grades K–6

- Flowers produce pollen and ovules, which join to become seeds.
- Seeds produce new plants.

- Fruits protect seeds and attract animals that help seeds scatter and germinate.
- Fruits, flowers, and seeds provide food for many animals, including humans.

Grades 4–6

- A seed is formed in a flower when pollen *fertilizes* an ovule.
 - Pollen is produced by the stamen.
 - Pollen is transferred from the stamen to the pistil (or carpel) of the same or another flower by bat, bird, insect, wind, gravity or other means.
 - It lands on the pistil, enters the ovary, and joins with an ovule.
- Seeds (fertilized ovules) *ripen*, or mature, as the ovary swells and forms a fruit.
- Seeds rest for a time after they ripen, before they can germinate. This is called the dormant time.
- Seeds drop and may be *dispersed* (scattered) to new locations, where they germinate.

3 Ways that Seeds Disperse

Grades K–6

Seeds are dispersed to new places by several different methods.

- *Animals* disperse:
 - Hitchhikers – *burs* and other seeds whose coats have hooks or spikes, which stick to the fur, feathers or feet of animals (cockleburs, burdocks, goatheads);
 - Fruits – eaten by animals, which deposit the fruit seeds with their dung (apple, mulberry, cherry, juniper berry);
 - Nuts and S eeds – buried underground by squirrels, mice, birds, and other animals, which often do not return to eat them (acorn, walnut, piñon seed).
- *Wind* carries winged seeds (elm, maple, pine), parachute seeds (dandelion, salsify), and cottony seeds (cottonwood, poplar).
- *Water* floats seeds away from their mother plants and deposit them on beaches and beside rivers and streams (cottonwood, coconut).

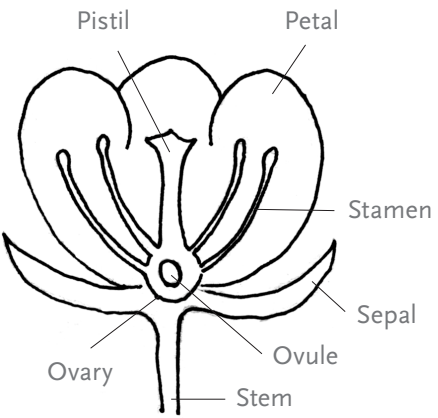
Grades 4–6

Anemochory (un-NEEM-uh-CORE-ee) – seed dispersal by wind

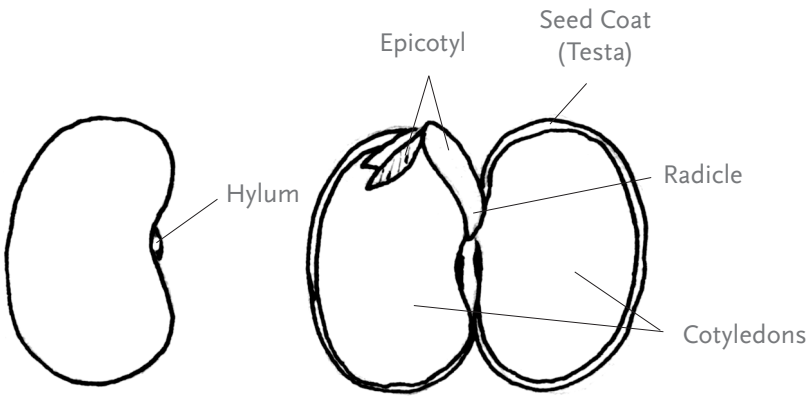
Hydrochory (HIGH-droh-CORE-ee) – seed dispersal by water

Zoochory (ZO-uh-CORE-ee) – seed dispersal by animals

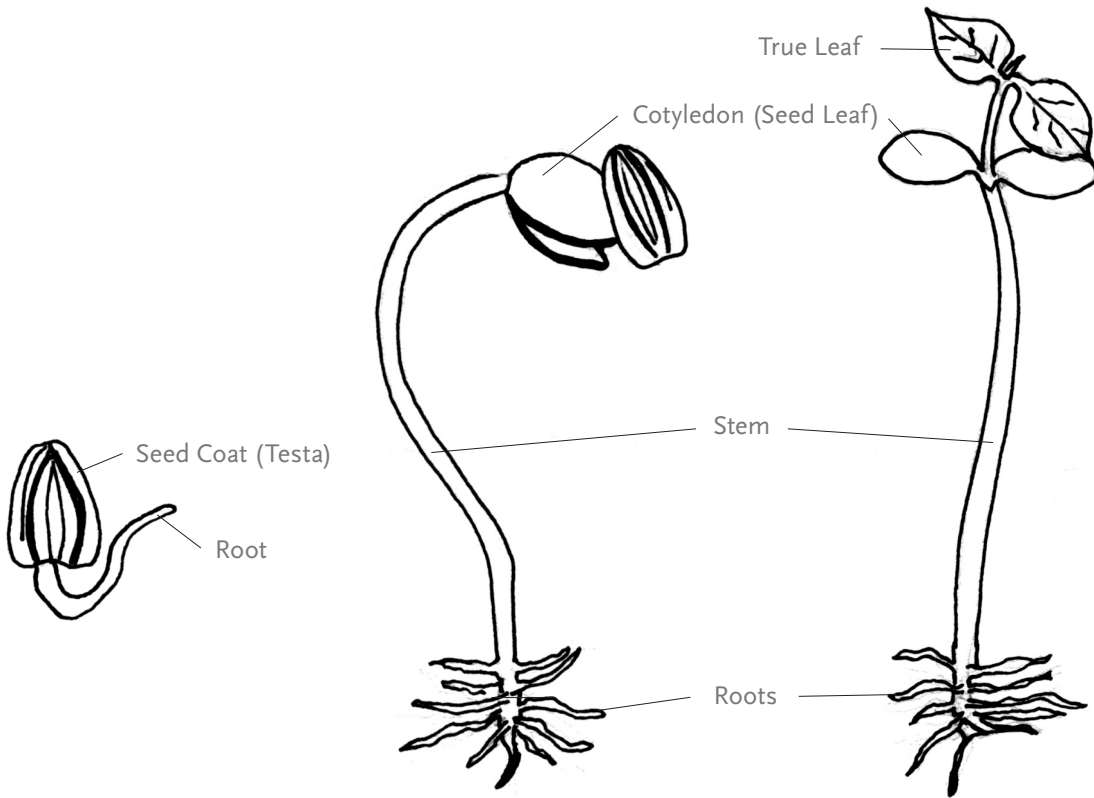
Flower and Seeds



Flower

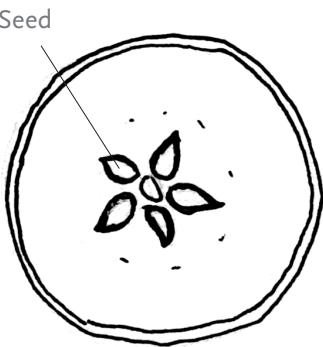


Bean (example of a seed)

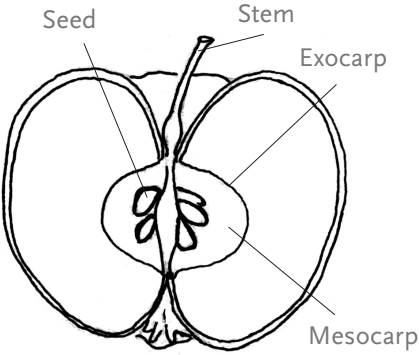


Germinating Sunflower Seed (Sprout)

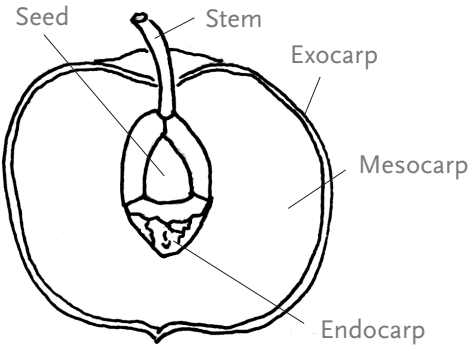
Fruits



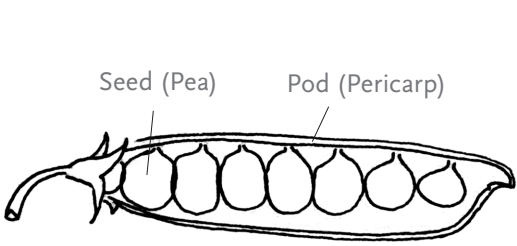
Apple
(horizontal cross section)



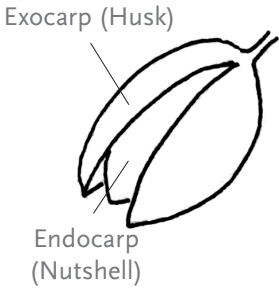
Apple
(vertical cross section)



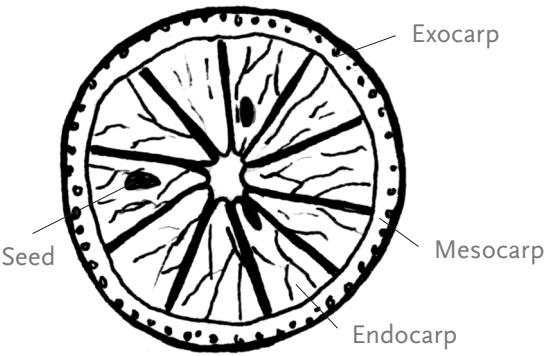
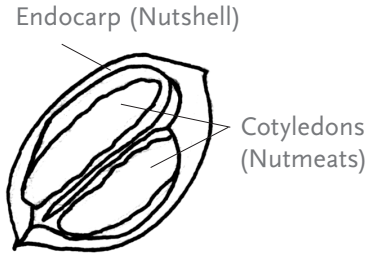
Peach
(vertical cross section)



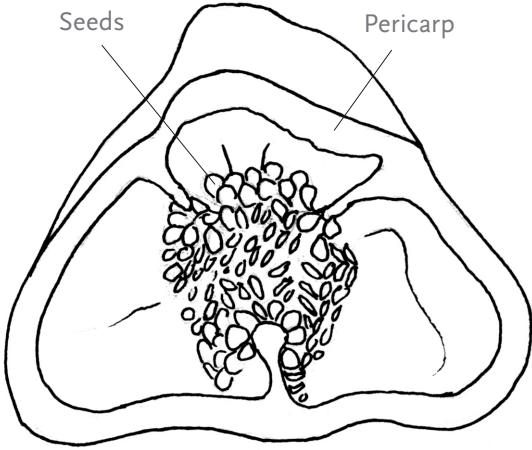
Pea



Pecan



Orange
(horizontal cross section)



Bell Pepper
(horizontal cross section)

Twigs and Buds

