



Colorado MASTER GARDENER

Plant Structures: Fruit

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Outline. . .

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Thought question:

- Why are fading flowers removed from spring flowering bulbs and other flowering ornamental plants?

Fruit evolves from the maturing ovary following pollination and fertilization. Fruits can either be fleshy or dry. They contain one or more seeds.



Function

- Reproductive
- Horticulture uses including:
 - feed, food, and oils,
 - aesthetic qualities, and
 - plant identification.

Structure

Fruit consists of carpels where the ovules (seeds) develop and the ovary wall or **pericarp**, which may be fleshy (as in apples) or dry and hard (as in an acorn). Some fruits have seeds (mature ovules) enclosed within the ovary (apples, peaches, oranges, squash and cucumbers). The peel of an orange, the pea pod, sunflower shell, and the skin flesh and pit of a peach are all derived from the pericarp.

Other fruit have seeds that are situated on the periphery of the pericarp (corn cob, strawberry flesh).

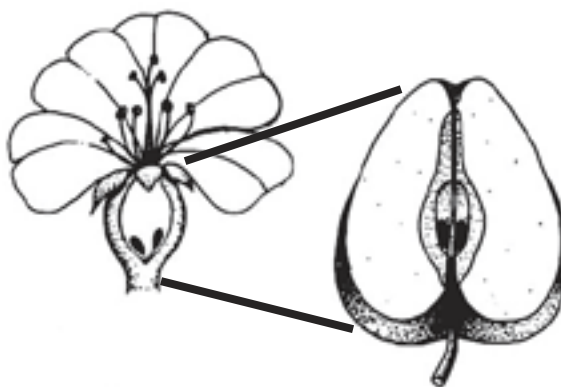
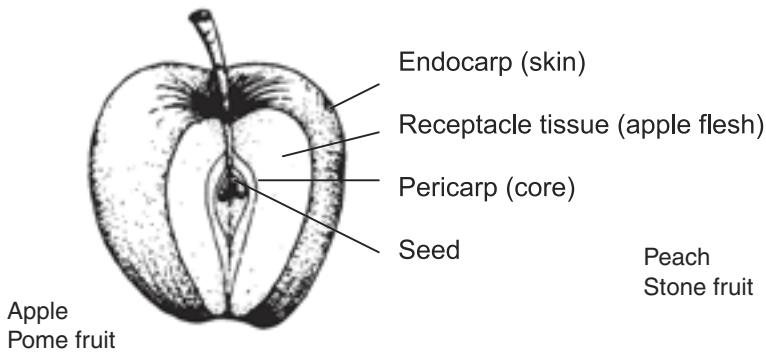


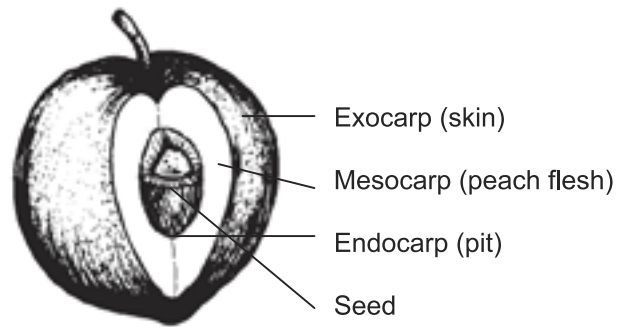
Figure 1. In apples, the ovary wall becomes the fleshy part of the fruit. Notice the small fruit structure in the blossom.

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Putting Knowledge to Work

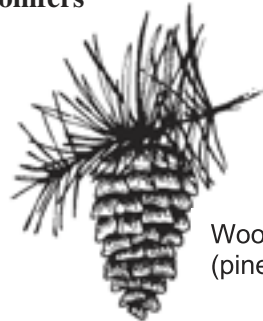


Peach
Stone fruit



Fruit Types

Conifers



Woody seed cone
(pine cone)

Fleshy seed cone
(juniper berry)



Flowering Plants (angiosperms)

Depending on flower structure and inflorescence type, fruits may be either simple, aggregate or multiple.

Simple – fruit formed from one ovary.

Aggregate – fruit formed from a single flower with many ovaries. If not all of the ovaries are pollinated and fertilized, the fruit will be misshapen (raspberry, magnolia).

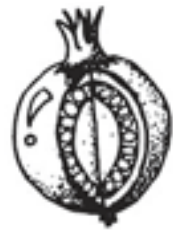
Multiple – fruit developed from a fusion of separate, independent flowers born on a single structure (mulberry, pineapple, beet seed).

Fruit examples with fleshy pericarp

Berry – pulpy fruit from one or more carpels that develops few to many seeds (tomatoes, eggplant, blueberries and grapes).



Hesperidium – leathery rind enclosing a pulpy juice sac (carpels) (citrus).



Pepo – hard rind enclosing a multiple carpel fleshy-watery interior with many seeds (cucumbers, melons, and squash).



Stone or Drupe – Simple fruit with single carpel. The **exocarp** (outer layer) becomes the thin skin; the **mesocarp** (middle layer) becomes thick and fleshy; and the **endocarp** (inner layer) becomes a hard stony pit (peaches, olives, cherries, plums).



Pome – simple fruit with several carpels and papery endocarp (apple, pear, quince).



Fruit examples with dry pericarp that splits open

Legume or Pod – fruit from a single carpel, usually splits along sutures. Found in members of the *Fabaceae* (pea) family (peas, beans).

Capsule – fruit from two or more carpels, each with many seeds (iris, poppy, jimson weed).

Follicle – fruit from a single carpel that splits along one suture (Delphinium).

Silique – fruit from two carpels with a septum between splits to expose seed along central membrane (mustards).

Fruit examples with dry pericarp that does not open at maturity

Achene – Simple, one-seeded, thin-walled fruit attached to an ovary wall (sunflower).

Caryopsis – One-seed fruit with a thin pericarp surrounding and adhering tightly to the true seed (corn, rice, wheat, and barley).

Nut – One-seed fruit with a thick, hard stony pericarp (oak, filbert, walnut).

Samara – One-seed fruit (elm, ash) or two-seed (maple) fruit with a wing-like structure formed from the ovary wall.

Schizocarp – Fruit formed from two or more carpels that split at maturity to yield one-seeded halves (carrots, dill, parsley, hollyhock).

Fruit Growth Terms

Bud development – On temperate-zone woody plants, buds typically develop mid-summer of the previous year. An exception is on summer flowering shrubs, where the buds develop on the current season's wood.

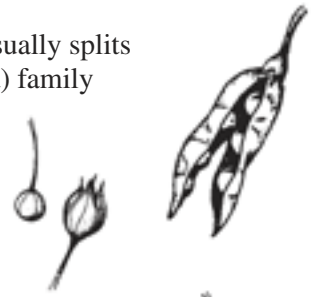
Pollination – transfer of pollen from the male flower to the stigma of the female flower.

Fertilization – union of the pollen grain from the male flower with the egg cell in the female flower.

Drop – fruit drops when not pollinated or fertilized and when too much fruit sets on a tree.

Growth – What we see as growth is primarily cell enlargement as the cells fill with water.

Climacteric – point when a fruit will continue to ripen if removed from a plant. For example, pumpkins turning orange after being harvested.



elm

ash

maple

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