

Fruit Structure and Function

Before a seed can germinate and develop into a mature plant, it must be deposited in suitable soil. Fruits play a key role in this process. A fruit is the mature ovary of a flower. While the seeds are developing from ovules, the flower develops into a fruit (Figure 38.10). The fruit protects the enclosed seeds and, when mature, aids in their dispersal by wind or animals.

Fertilization triggers hormonal changes that cause the ovary to begin its transformation into a fruit. If a flower has not been pollinated, fruit typically does not develop, and the flower usually withers and dies. During fruit development, the ovary wall becomes the pericarp, the thickened wall of the fruit. In some fruits, such as soybean pods, the ovary wall dries out completely at maturity, whereas in other fruits, such as grapes, it remains fleshy. In still others, such as peaches, the inner part of the ovary becomes stony (the pit) while the outer parts stay fleshy. As the ovary grows, the other parts of the flower usually wither and are shed.

Fruits are classified into several types, depending on their developmental origin:

- Most fruits are derived from a single carpel or several fused carpels and are called **simple fruits** (Figure 38.11a).
- An **aggregate fruit** results from a single flower that has more than one separate carpel, each forming a small fruit (Figure 38.11b). These “fruitlets” are clustered together on a single receptacle, as in a raspberry.
- A **multiple fruit** develops from an inflorescence, a group of flowers tightly clustered together. When the walls of the many ovaries start to thicken, they fuse together and become incorporated into one fruit, as in a pineapple (Figure 38.11c).

▼ **Figure 38.10 The flower-to-fruit transition.** After flowers are fertilized, stamens and petals fall off, stigmas and styles wither, and the ovary walls that house the developing seeds swell to form fruits. Developing seeds and fruits are major sinks for sugars and other carbohydrates. American pokeweed flowers and fruits are shown here.

