

PLANT STRUCTURE

PLANT ORGANS

The sporophytic **shoots** of vascular plants consist of stem plus leaves. Shoots contain an apical meristem of actively dividing cells that, through continued differentiation, result in the elongation of the stem and formation of leaves and buds. The **stem** is a generally cylindrical organ that bears the photosynthetic leaves. Stems typically function in conduction of water and minerals from the roots and in support and elevation of both leaves and reproductive structures, although some stems are highly modified for other functions.

The **leaf** is that organ of the shoot that is generally dorsiventrally flattened and that usually functions in photosynthesis and transpiration. Leaves are derived from **leaf primordia** within the shoot apex and are often variously modified. In vascular plants, leaves contain one to many vascular bundles, the **veins**; in some mosses, the gametophytic leaves may contain a veinlike **costa**, consisting of specialized (although not truly vascular) conductive tissue. **Buds** are immature shoot systems, typically located in the axils of leaves. Buds may grow to form lateral vegetative branches or reproductive structures.

Among reproductive plant organs, the **sporangium** is the basic spore-producing part of all land plants. In heterosporous plants (including all of the seed plants) sporangia are of two types: male (microsporangium) or female (megasporangium).

The sporangium of liverworts, hornworts, and mosses is known as a **capsule** and typically makes up most of the sporophyte. A **cone**, also called a **strobilus**, is a modified, determinate, reproductive shoot system of many nonflowering vascular plants, consisting of a stem axis bearing sporophylls. An **ovule** is a megasporangium enveloped by one or more protective integuments. A **seed** is the mature ovule of the seed plants, consisting of an internal embryo

surrounded by nutritive tissue (endosperm) and enveloped by a protective seed coat. The reproductive organ of angiosperms is the **flower**, a modified, determinate shoot bearing sporophylls called stamens and carpels, with or without outer modified leaves (the perianth). An **inflorescence** is an aggregate of one or more flowers, the boundaries of which generally occur with the presence of vegetative leaves. A **fruit** is the mature ovary of flowering plants, consisting of the pericarp (mature ovary wall), seeds, and (if present) accessory parts.