

Buried treasure: bulbs and more

Fall activity

Activity: Students learn about the structure of a true bulb and bulb-like organs such as corms, tubers and rhizomes by looking at examples; students plant bulbs in designated garden areas.

Goals: To learn about the structure and function of bulbs and bulb-like plant parts; to learn how to plant a bulb; to compare bulb planting with planting seeds and plant starts.

Supplies: Bulbs bagged for each class, bulb "show and tell" box, tools for planting bulbs (trowels, shovels), bulb information sheets; straw and flags to mark planting location.

How to proceed

Read over the bulb facts below prior to your lesson and use the information as a basis for discussion with your class. More details will be in the "Bulb booklet" in the garden shed. You can also go to <http://urbanext.illinois.edu/bulbs/bulbbasics.html> for a nice discussion (hard copy in booklet).

Go through the bulb "show and tell" box and discuss whether each item is a true bulb or some other plant part. You may wish to refer to the "Bulb booklet" for additional information.

Other discussion ideas:

- (1) Bulbs as plant adaptations to dry weather or cold weather;
- (2) What are common edible bulbs? (onions, garlic) What other common vegetables grow underground? Are they bulbs, roots, tubers, etc.?
- (3) Compare bulb planting to seed planting or plant starts. What grows faster? Which do they think is easier to plant?

Next, prepare your class for their bulb planting. Make sure they understand that the pointed end of the bulb points up and the dangling roots point down. Have students dig holes approximately twice the height of the bulb, so that the bulb is covered by soil equal to its height.

Find out your planting location assignment. Depending on the soil consistency at the site, you may wish to help the children plant by loosening the soil in the planting bed and amending it with some compost (finished compost is under the butterfly bushes in the science garden) before the students start to dig. This will make it easier for them to dig the bulb holes with their forks or trowels. If you run into bulbs already growing in your location, please explore your location until you can find an unoccupied place.

When you have completed your planting, mark your planting location by scattering a little leftover scarecrow straw over the location or mark it with a flag.

If it is raining or the ground is too wet, you may have to delay your planting for another day. Please let me know if you will not be able to complete your bulb planting as we need to get all the bulbs in the ground.

Bulb Facts

What is a bulb?

The word bulb loosely describes plants that grow from an underground mass of food storage tissue. There are many bulb or bulblike plants that hold a reserve of nutrients in a thickened, underground storage organ. Botanists classify the thickened tissue as a stem or root based upon certain features of its anatomy.

A **true bulb**, like a daffodil or tulip, contains a complete plant inside. Bulbs are plant packages that contain a flower bud or buds, leaves, stem, dormant roots, and food storage structures. True bulbs can be identified by their layered structure of thickened storage leaves (e.g. like an onion).

Corms (gladiolus, crocus) are solid, thickened stem bases. They can look like true bulbs on the outside, but lack all the specialized structures (layers) of true bulbs.

Tubers (potato, caladium, cyclamen) are other another type of thickened stem structure. They can sprout from "eyes" all over their surface.

Rhizomes (iris, ginger)are thickened stems that grow horizontally. Roots sprout on the bottom of rhizomes.

Tuberous roots (dahlia) are thickened root structures in contrast to the stem structures above.

Bulb structure

Refer to the bulb diagram sheets.

The main body of a bulb is formed by thickened, modified "scale leaves." The outermost scale leaves that are thin and brown protect the bulb against invasive soil microorganisms and insects. The fleshy, interior leaves are food storage for the plant.

The central flower bud is found in the central core of the bulb. The bud contains immature foliage leaves that will eventually emerge from the bulb along with the flower bud.

The small, disk-like structure at the base of the bulb is the stem of the plant. Numerous roots grow from the underside of the stem. The leaves and bud are attached to the upper side of the stem.

Small axillary buds may grow outward from the stem. These buds enlarge to form new bulbs and can be split apart (e.g., dividing your bulbs) to form separate plants.

When a bulb starts to sprout, a flowering plant grows up and roots grow down.

Bulb adaptations

Bulbs and bulb-like structures are adaptations that enable some plants to become dormant underground and withstand seasonal cold or dry conditions. Once conditions are favorable for growth, the dormant underground structures begin to grow and sprout. The plant is able to grow rapidly by using up the stored energy reserves in the thick underground bulb structure. Most bulbs bloom only once a year.

Planting and caring for bulbs

Bulbs prefer soils that drain well. They will rot if they are saturated in water over a period of time, although they do need adequate moisture to maintain healthy roots. In heavy soils, a good rule of thumb is to plant the bulb as deep as it is tall, or three times as deep as the bulb's greatest diameter. In areas subject to hard freezes or with more porous soils, bulbs may be planted deeper. Some bulbs even have contractile roots that enable them to pull themselves deeper!

After a bulb has finished flowering, its supply of nutrients is depleted and must be replenished by photosynthesis in the remaining leaves. Therefore, to help insure repeated blooming by bulbs, it is important to leave the foliage on the plant until it has died back on its own. A clever gardener may disguise the unsightly foliage by over-planting a bulb bed with annual plants. Some bulbs, like tulips, may not reliably repeat bloom in our area because they have a chilling requirement and need a certain amount of cold weather to grow well.