# 2020-1-SK01-KA226-SCH-094350

**THE STEM (caulom)**

- the above-ground part of vascular plants

- negatively geotropic

- divided into nodes and internodes

- bears the leaves, flowers and fruit, transports nutrients

* *other functions:* 
  + *assimilation*
  + *reproduction*
  + *storage*
* *types of stems:*
* herbaceous stems
  + **scape** – a leafless peduncle with leaves on the ground (daffodil)
  + **culm** – a hollow stem fortified by nodes where the long, narrow leaves are attached (grasses)
* woody stems
  + **tree** – comprised of a **trunk** and **crown**
  + **shrub** – a wood stem branched out just above the ground (elderberry)
  + **subshrub** – similarly branched out but with herbaceous twigs (bilberry)
* *types of stems according to the direction of growth:*

**erect** – grows upright

**trailer** – does not root

**stolon –** roots at nodes

**twiner** – climbs the support

**Internal stem structure**

1. **epidermis** – thin, prolonged cells without interstitium, the outer side can be covered in cuticle or hairs.
2. **ground tissue** – separates the dermal and vascular tissues, can contain basic tissues, resin ducts and laticifers.
3. **stele** – comprised of
   * **pericycle** – located just inside the endodermis
   * **vascular bundles** – all except for radial (collateral, concentric)
   * **pith** – mechanical function

* *branching of the stem:*

1. **monopodial** – the lateral branches do not overgrow the central leader shoot (oak)
2. **sympodial** – the lateral branches become leader shoots (tilia)
3. **dichotomic** – the terminal bud stops growing and divides into two equal branches (ferns).

# Secondary growth

* the stem of gymnosperms and dicotyledons grows secondarily via secondary meristems
  + **cambium** – located between the phloem and the xylem of the vascular bundle. It produces secondary xylem inwards and secondary phloem outwards – *tree-rings*.
  + **phellogen** – part of the primary bark. Inwards it produces the cells called phelloderm, outwards it produces cork cambium, making a secondary covering called periderm.

*Modifications of the stem:*

* + **runner *–*** thin secondary stems - reproduction (strawberry)
  + **rhizome** – underground stems with the functions of storage and reproduction (polypody)
  + **spur** – a shortened lateral branch of some conifers (pine) and a lateral branch of some deciduous trees bearing flowers (apple tree)
  + **stem tuber** – growth of the basic tissue of the stem, serves as a nutrient storage and for reproduction (radish)