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 **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)