Department of biology

GENERAL BOTANY

Lab5

Stage -1-

Plant organs

By

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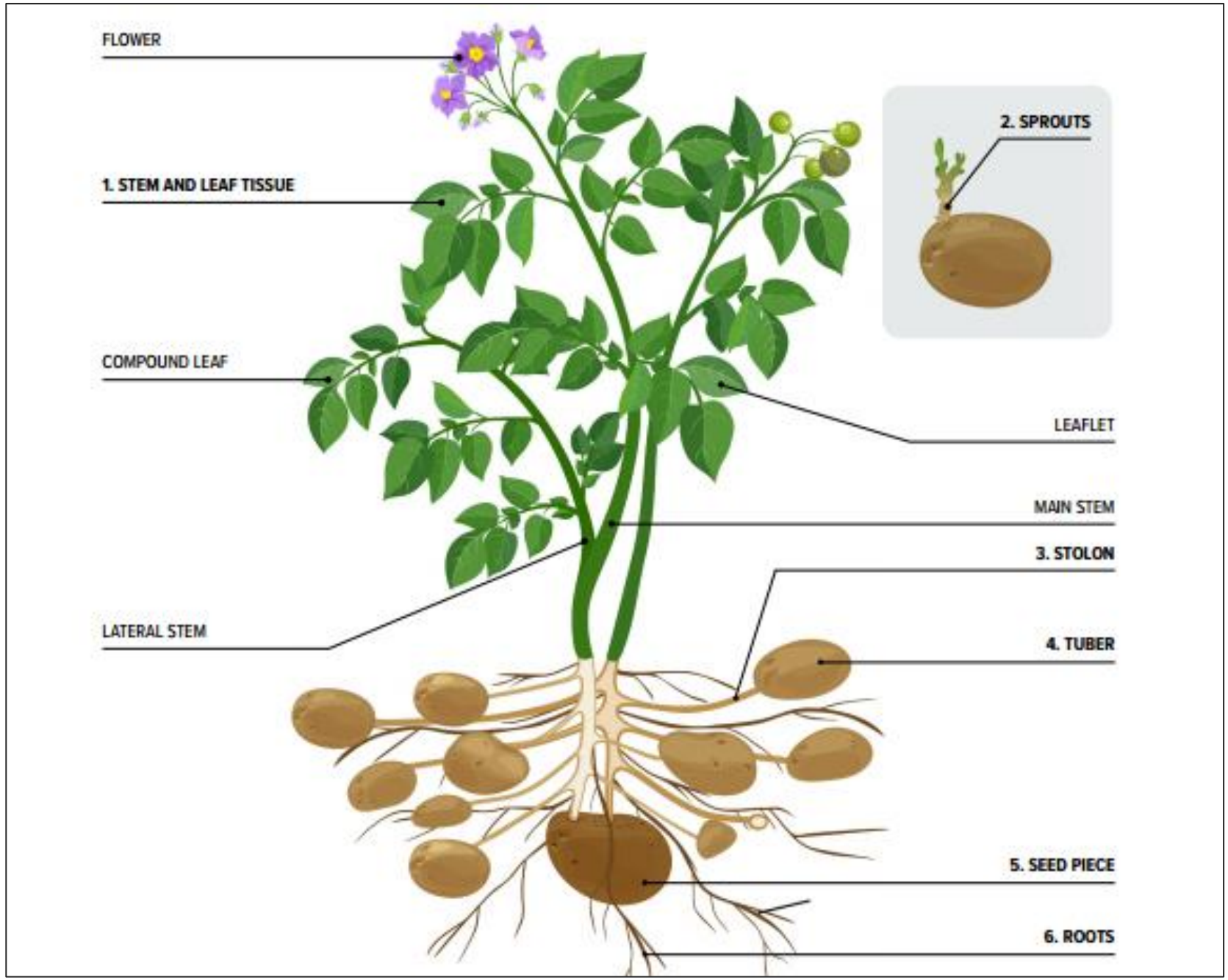
Stems

- The vegetative system includes **axes** or main **axes** that represent the **stem or stems with their branches and leaves**. Note that the origin of the stem is the **plumule** of the seed embryo.
- Leaves are borne on areas of the stem called **nodes**, while the areas between these nodes are called **internodes** and are leafless.
- Seed plants generally have distinct, clearly visible stems, so they are described as **caulescent**. The Latin word "callus" means stem, while other stems are described as **acaulescent**. A stemless plant, although it has a stem, is either subterranean or greatly reduced, such that the leaves appear clustered in a bundle at the ground level called a **rosette**. In such plants, flowers are borne on leafless flower stalks known as **scapes**, and the plant is therefore described as **scapose**, as in onions ***(Allium* sp.*)***, ***Aloe* sp.,** and *Narcissus* sp.

Stems

- Since ancient times, plants have been divided based on the nature of their stems into herbs, shrubs, and trees. **Herbaceous plants** have soft, weak stems that live no longer than one year. These stems are either hollow, such as rice (Oryza sp.), beans, barley, and reeds, or solid, with pith tissue filling the center, such as corn, cyperus, and bamboo.
- **Shrubs and trees** have woody stems because their stems live year after year. Shrubs have numerous branches of similar thickness and length that emerge directly from the ground, such as **pomegranate (*Punica*), oleander (*Nerium*), and rose.**
- While **trees** have a main trunk from which branches branch out, such as **mulberry (*Morus*)** and ***Eucalyptus***, some trees do not have trunks that branch out into branches, such as the palm genus ***Phoenix***.


FLOWER
1. STEM AND LEAF TISSUE
COMPOUND LEAF
LATERAL STEM
2. SPROUTS
LEAFLET
MAIN STEM
3. STOLON
4. TUBER
5. SEED PIECE
6. ROOTS

Flowering plants are divided according to their lifespan into the following

A. **Annual plants**: These are plants that complete their life cycle from seed germination to fruit and seed formation in a **single year** or **season**, such as cucumbers, melons and beans.

B. **Biennial plants**: These are plants that complete their life cycle in **two years**. In the first year or season, the root system and some basal leaves are formed. The roots store a quantity of food that the plant uses in the following season to form the stem, leaves, flowers, and fruits, and then the plant dies, such as sugar beet (*Beta* sp.)

C. **Perennial plants**: These are plants that live for more than two years, such as palm trees, and pine.

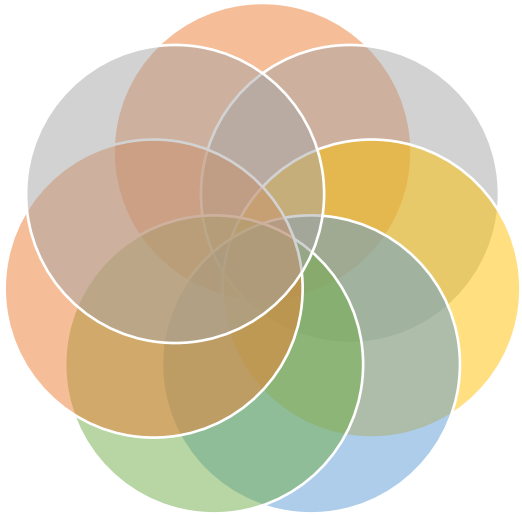
Type of stems

1- Aerial stems : (These grow above the soil surface)

Climbers Stems

Twiners Stems

Runner Stems



Erect stems

Ascending stems

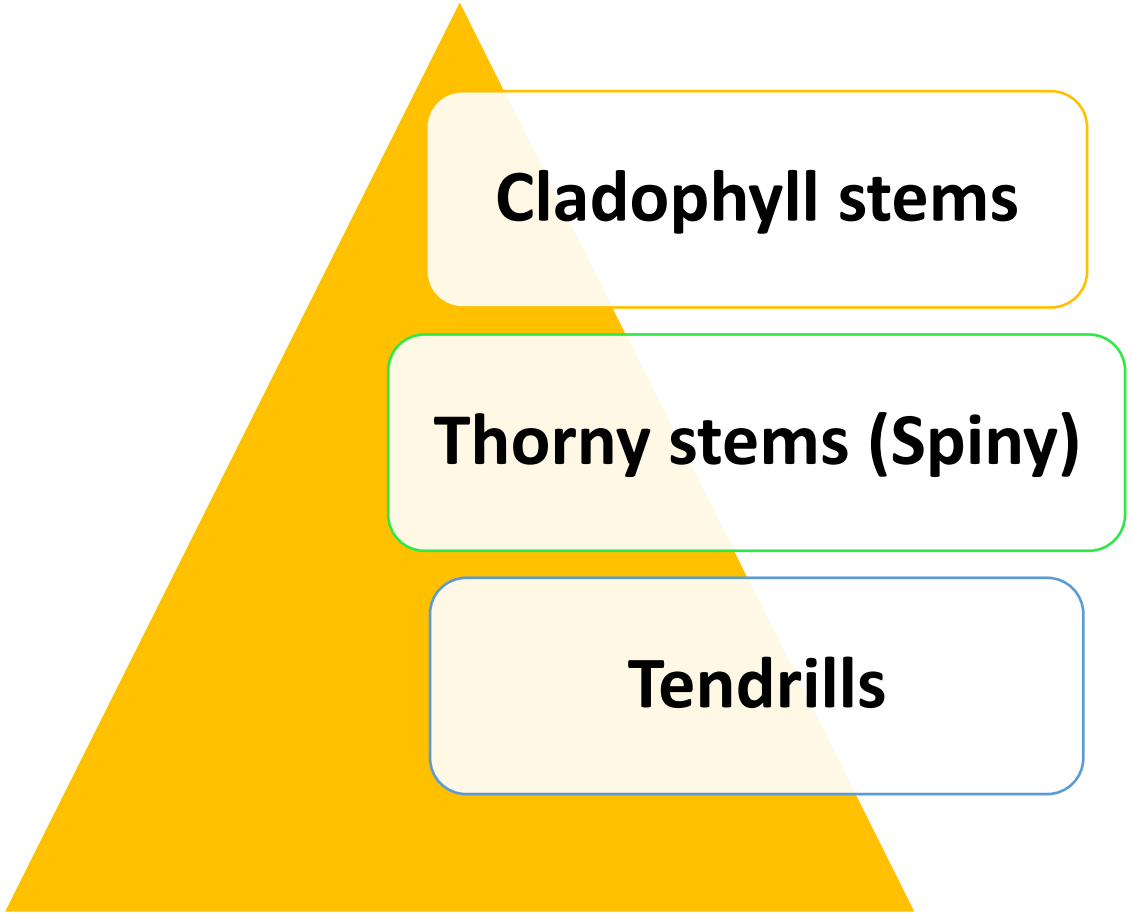
Prostrate stems

Type of stems

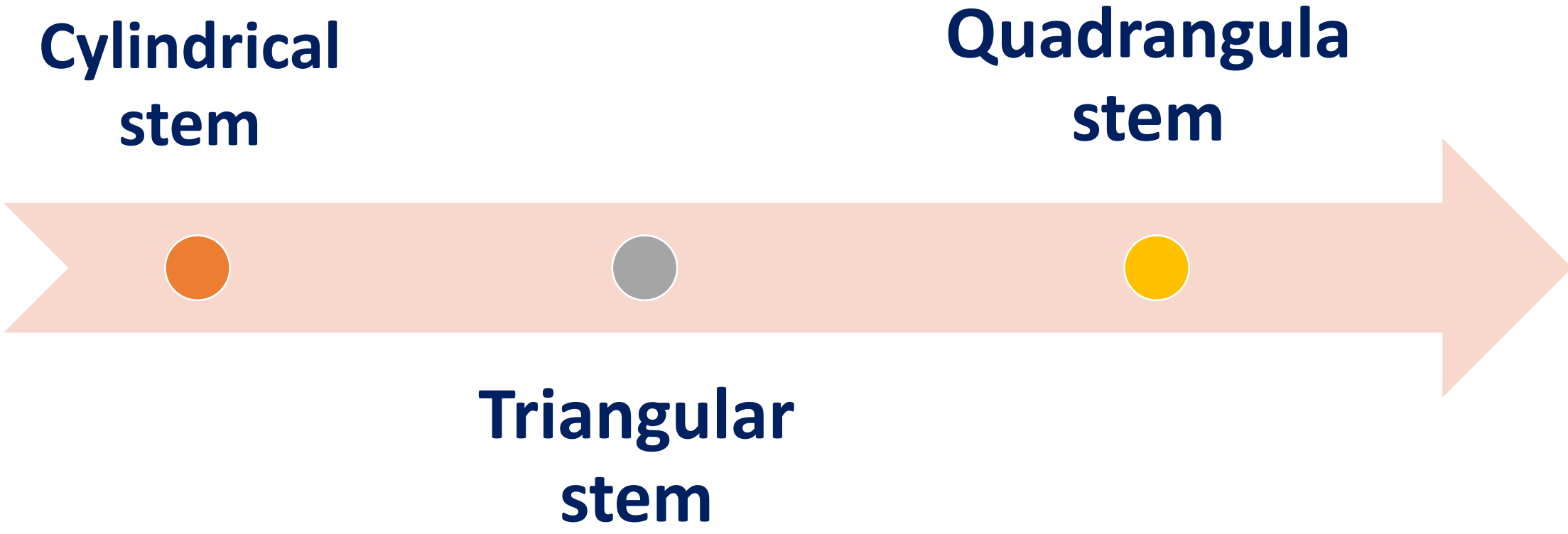
2- Subterranean Stems: (These are modified stems that grow and remain below the soil surface and take various forms)

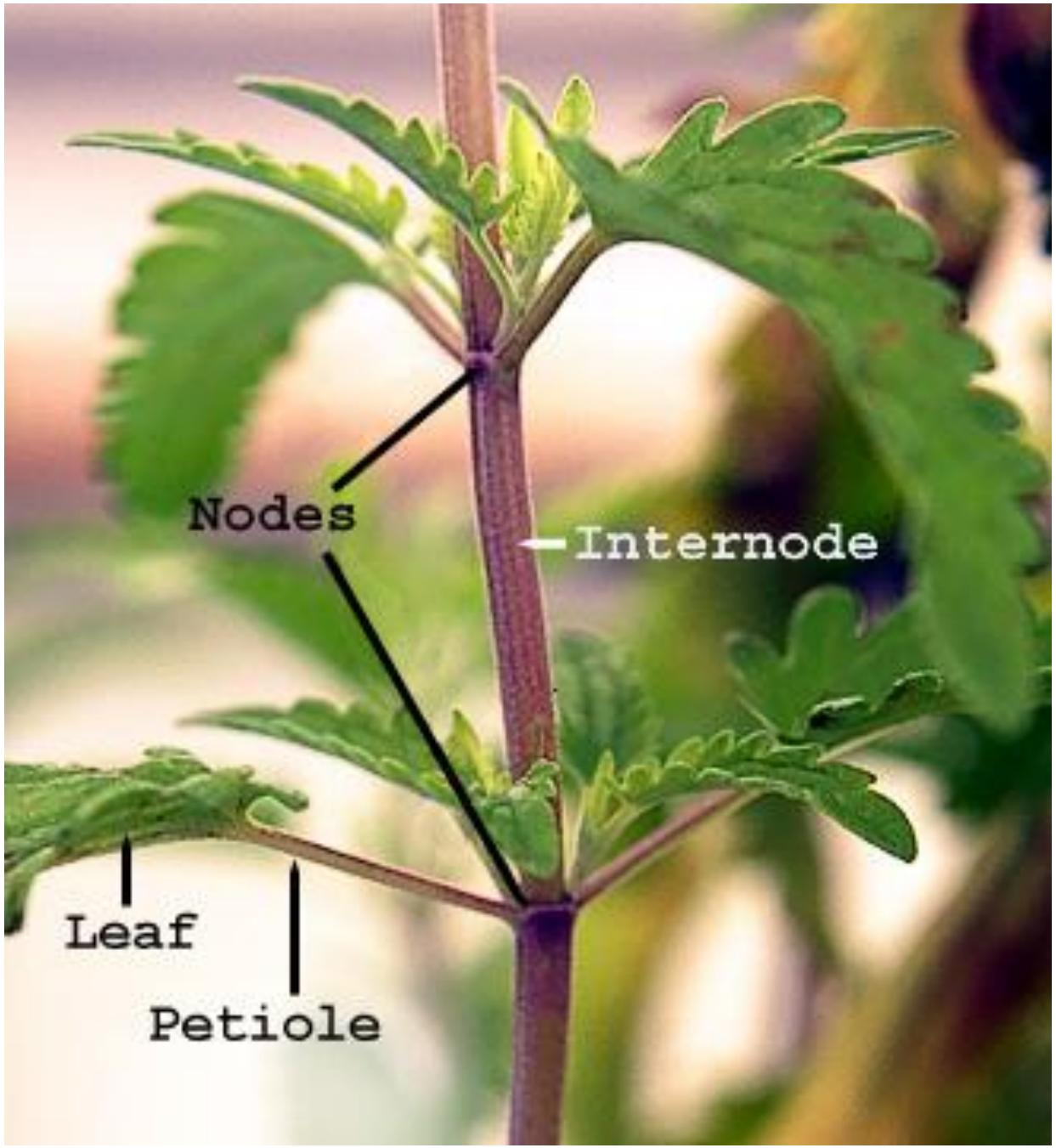
- **Rhizome**
- **Tuber**
- **Bulb**
- **Corm**

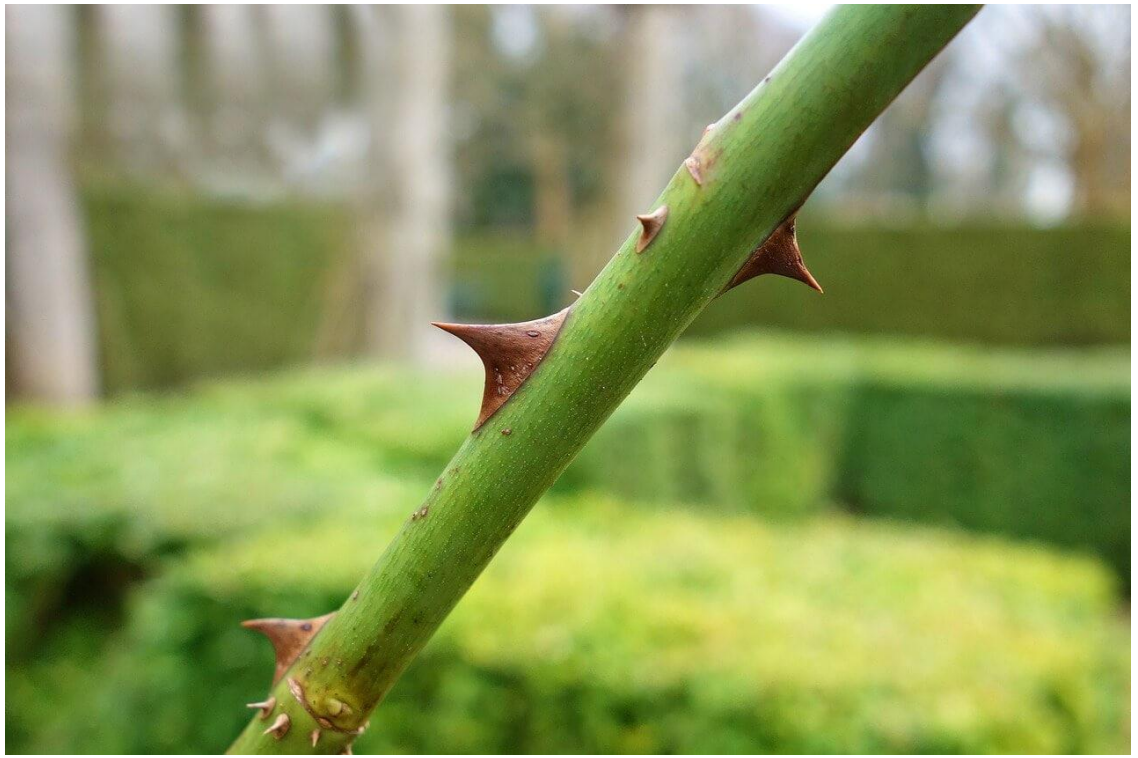
Aerial stems undergo modifications, similar to those of terrestrial stems, and take several forms, including



Shape of the Stem




Nodes
Internode
Leaf
Petiole

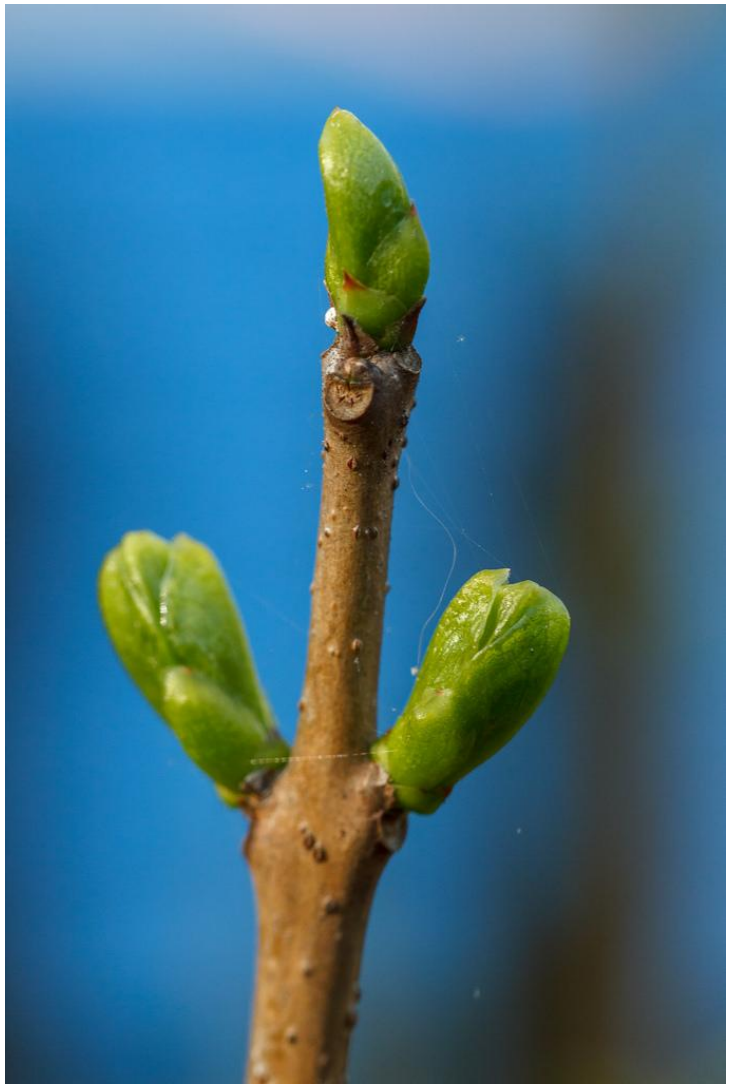


Buds

- A bud is a meristematic region surrounding embryonic leaves. Buds are usually located either at the tips of stems and branches, known as **(Apical buds)**, or in the leaf axils, where they are **(Lateral or Axillary).**

- In many species, additional buds are often found on either side of the axillary bud. These are called **(Accessory buds)**, as in the case of ***Prunus***, where three buds are found at the node. The central one is the **(Principal bud)**, a leaf bud that produces a leafy branch, and on either side of it are two flower buds additional.

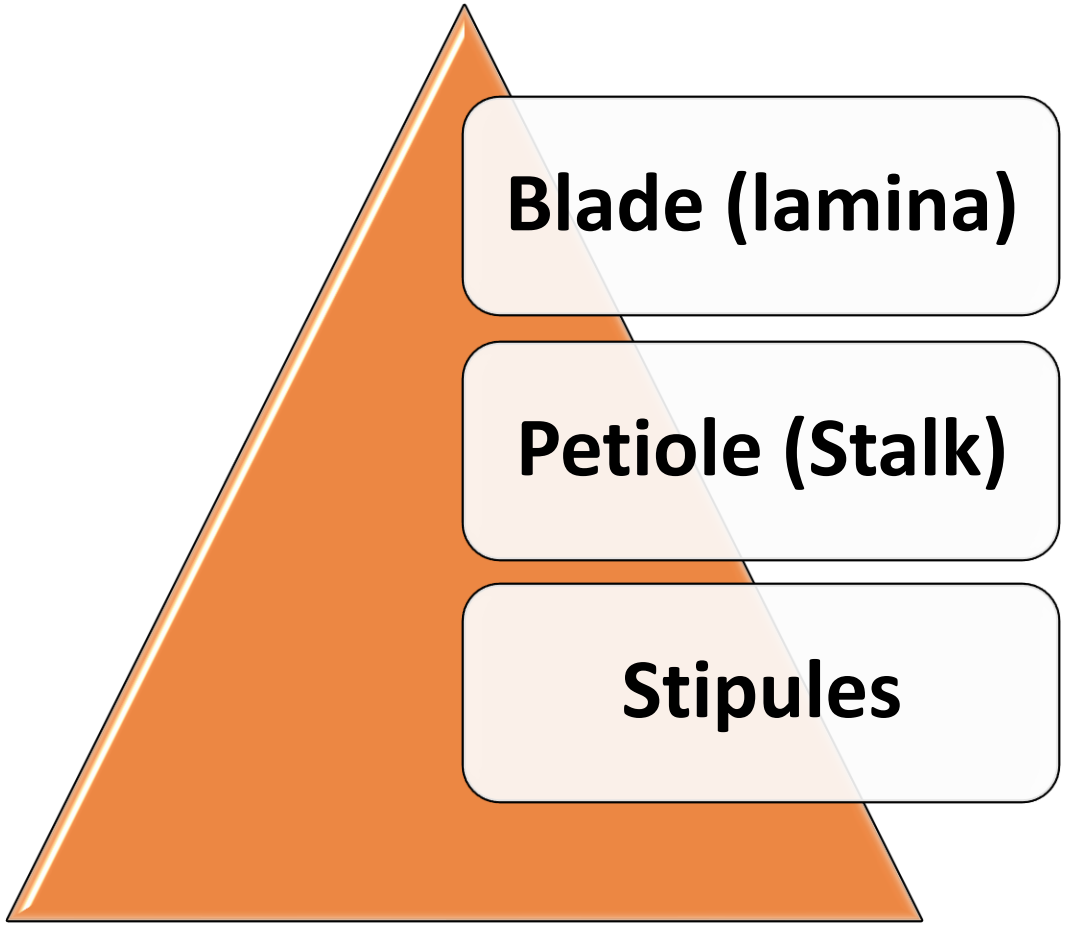
Buds are classified according to their structure into the following



Leaves

- Leaves are flat structures borne on the nodes of the stem. Their primary function is photosynthesis and transpiration. Leaves come in a variety of shapes and variations, more than any other plant organ. They are not always flat or always green, They are borne on aerial stems, but they can also be found on terrestrial stems or submerged in the water. Leaves attached to the stem are called cauline leaves, while those attached to the base of the stem or to the root are called basal or radical leaves.

Leaf parts



Question

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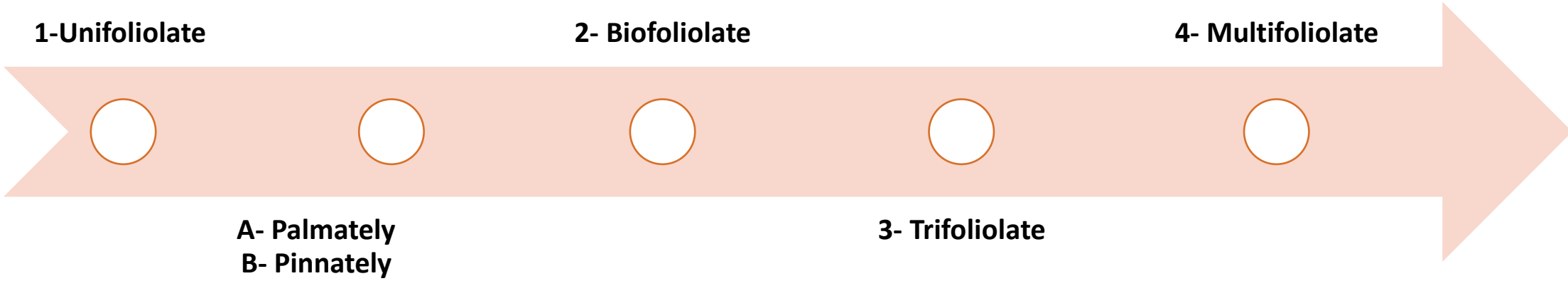
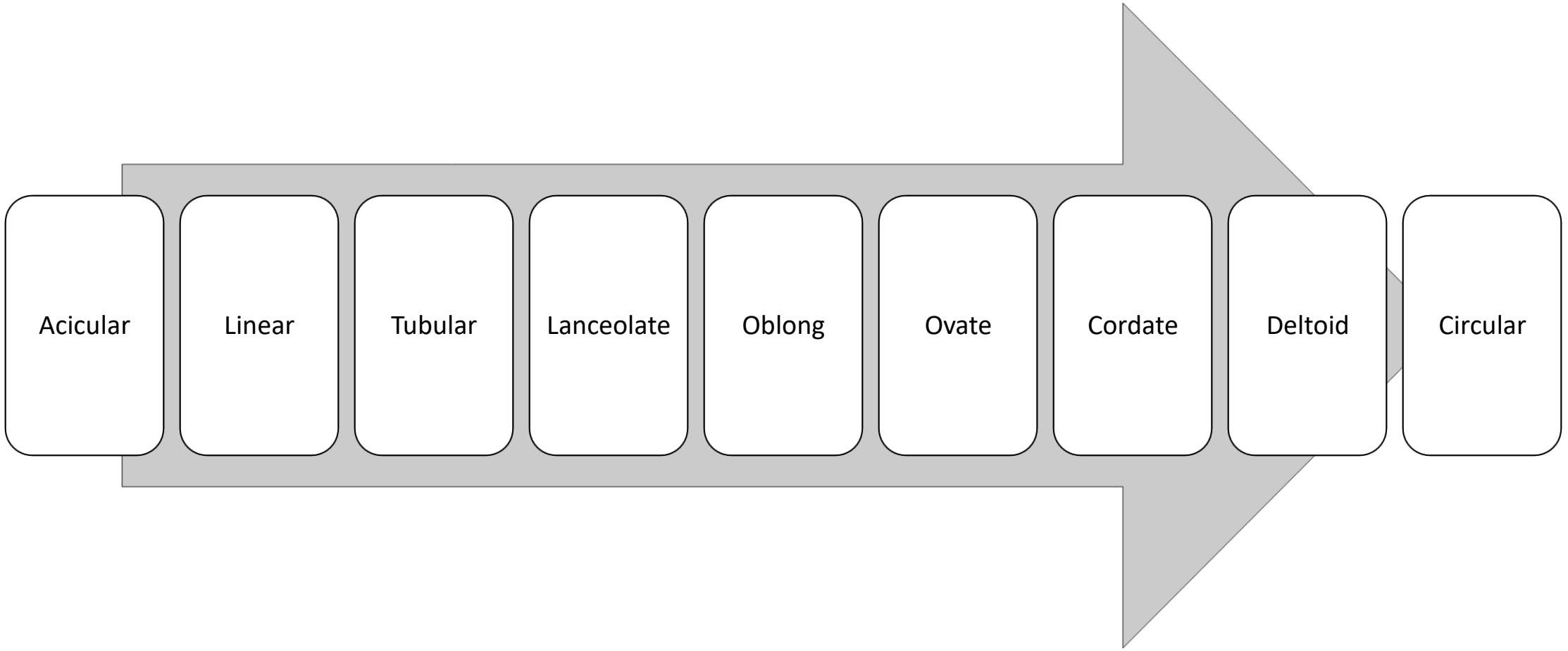
Compound leaves are classified according to the number of leaflets as follows

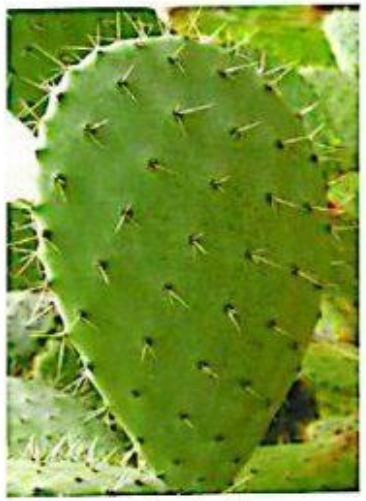


Leaf Blade Shapes



Leaf Modification

- Spines
- Tendrils
- Storage leaves
- Insectivorous
- Scale leaves

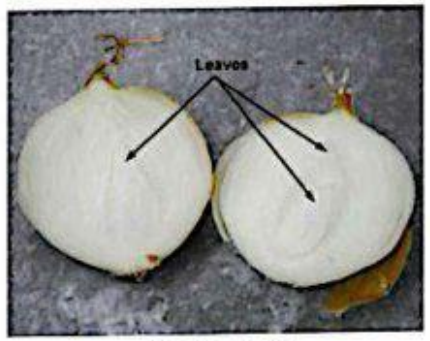


Spines leaf

Tendrils leaf

Storage leaves

Portulaca leaves



Storage leaf

Venus-fly trop *(Dionaea)*

Pitcher-plant *(Nepenthis)*


Thank
you