

How Are Plants Named and Classified?

- Plants are classified by their similarities within their characteristics.
 - Taxonomists compare flower patterns, stem and leaf structures, life cycles, genetic similarities and many other characteristics.
- They are then grouped in specific categories, or taxas:



<u>Categories/Taxa</u>	<u>Example*</u>
Kingdom	Plantae
Phylum	Pteridophyta
Class	Filicopsida
Order	Polypodiales
Family	Dryopteridaceae
Genus	Polystichum
Species	<i>setiferum</i>

*Sample classification of a Soft Shield Fern



- 📘 All plants are in the Kingdom Plantae.
- 📘 Vascular plants (plants with tissue specialized for conducting materials) are all in the Phylum Tracheophyta.



 There are many Classes, Orders, and Families of plants. Even though each plant is categorized using at least seven names, we call plants by only their last two scientific names, a naming system called ***binomial nomenclature*** (which means a two-name system of identifying).

- This classification system was developed by Carolus Linnaeus and uses Latin terms to name plants



- The two names that we use for the scientific names of plants are the **Genus** name, which is always capitalized, and the **species** name which is always lower case (e.g. *Solanum melongena*)
- The genus is a group of plants that are very similar to each other. The species is a group of plants that are so similar that they usually mate freely with each other in the wild. Plants are also called by common names, but those names are specific for language and geographic location. Scientific names are specific and remain the same across languages and borders. Although it is the Aubergine in Afghanistan, the plant is *Solanum melongena* everywhere on Earth.



What Are Some Ways That We Can Put Plants Into Groups?

- 📘 The plant kingdom has become successful all over the Earth. They have done so by adapting to a wide variety of different conditions and niches. The following are some of the major groups of plants.
 - Bryophytes, ferns, gymnosperms and angiosperms

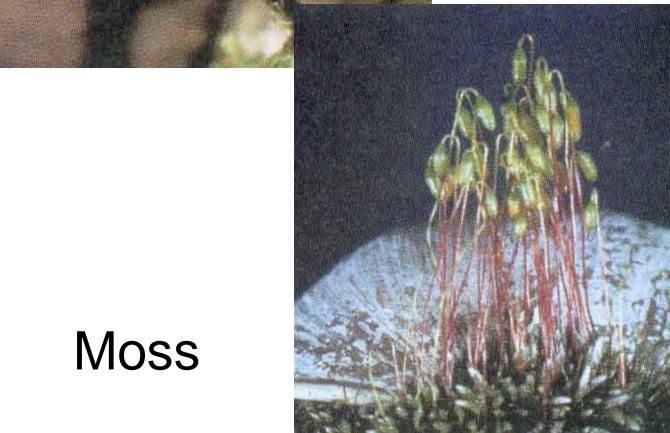


Bryophytes

- ❑ Belong to the phylum Bryophyta
- ❑ Non-vascular plants
 - No conducting tissues
- ❑ Live in damp places
- ❑ Limited in size due to lack of conducting tissue
- ❑ Ex. Mosses and liverworts



Liverwort



Moss

Ferns



Fiddleheads



Spores on
underside of
frond



Ferns in the
forest

- ❑ Vascular plants
- ❑ Reproduce by spores
- ❑ Have no true leaves; Only fronds
- ❑ Fronds produce food and spores
- ❑ New fronds called fiddleheads

Gymnosperms

- Reproduce with seeds found in cones
- Also known as a **conifer**
- Leaves reduced to scales or needles
- Most are **evergreen** – hold on to their green color year round
 - Ex. Pines, spruce, cedar
- Some can be **deciduous** – lose their leaves
 - Ex. Ginkgo, larch



Coniferous evergreen –
Pinus contorta



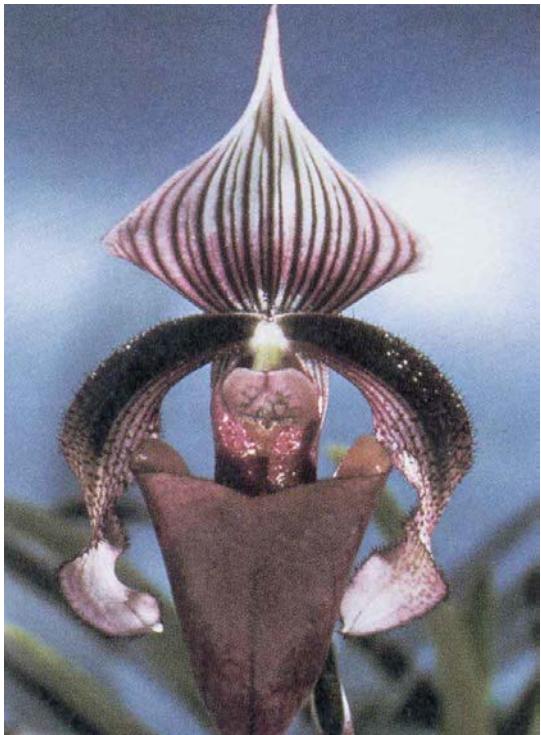
Deciduous conifer –
Ginkgo biloba

Angiosperms

- Plants that reproduce by flowers
- There are two types: monocotyledons (monocots) & dicotyledons (dicots)
- A **cotyledon** is a food storage structure in the seed.
 - Monocots have a single cotyledon
 - Ex. Grasses, maize and lilies
 - Dicots have two cotyledons
 - Ex. Roses, petunias, cranesbill, and beans



Angiosperms - Monocot



Orchid – *Paphiopedilum curtisii*

- ❑ Have flower parts (sepals, petals, stamens, pistils) in multiples of three
 - 3, 6, 9...
- ❑ Parallel venation within the leaves
- ❑ Stems with scattered vascular bundles
- ❑ Narrow leaves
- ❑ Fibrous root system

Angiosperms - Dicot

- Flower parts are in multiples of 4's or 5's
 - 4, 12, 16 or 5, 10, 15
- Netted veins
- Vascular bundles are in rings around the stem
- Have broad leaves
- Taproot system

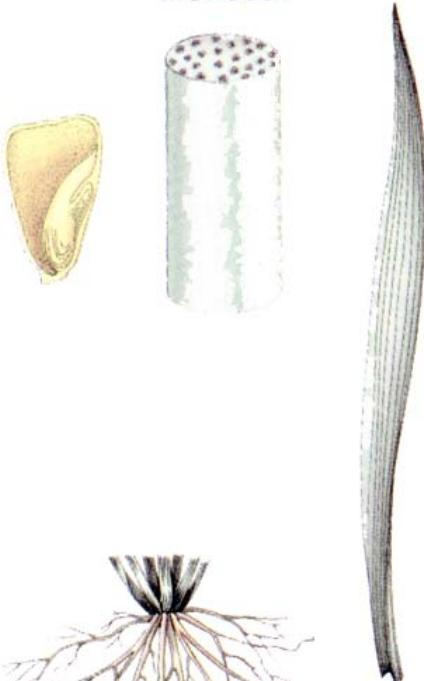


Hibiscus sp.



Monocot vs. Dicot

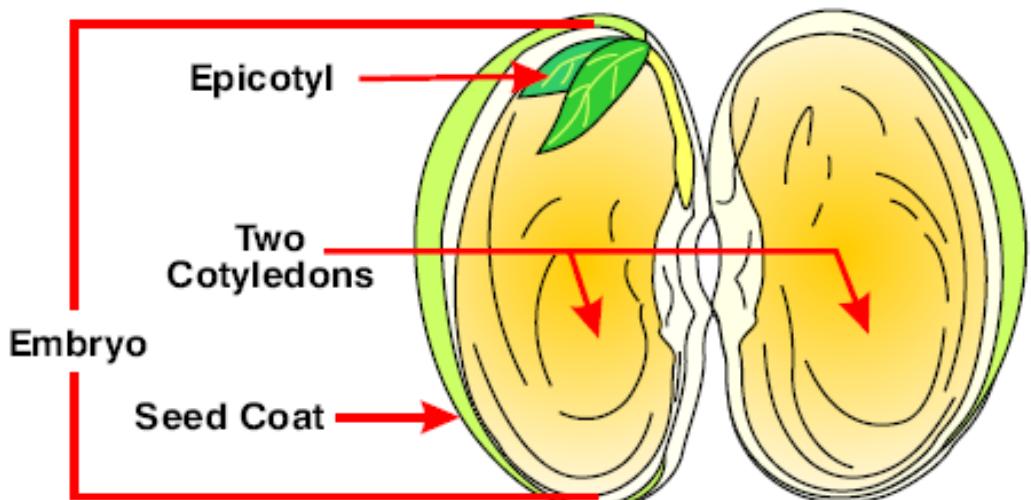
Monocot



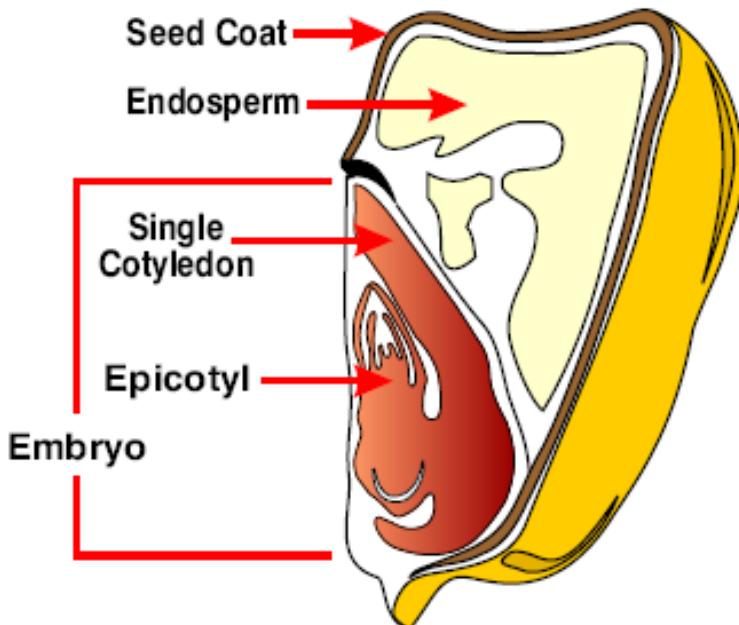
Dicot



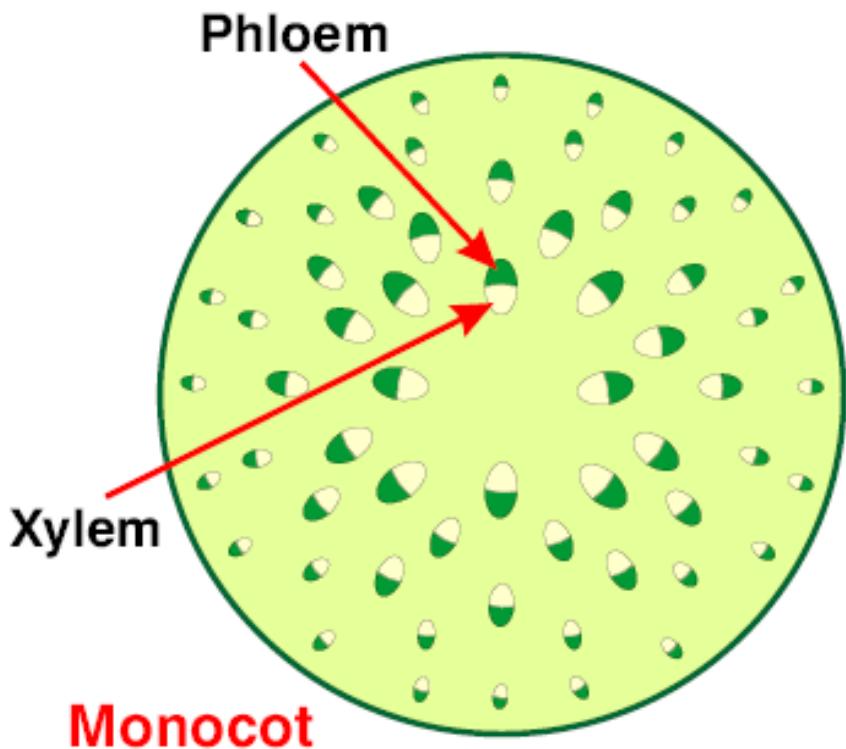
DICOTS AND MONOCOTS



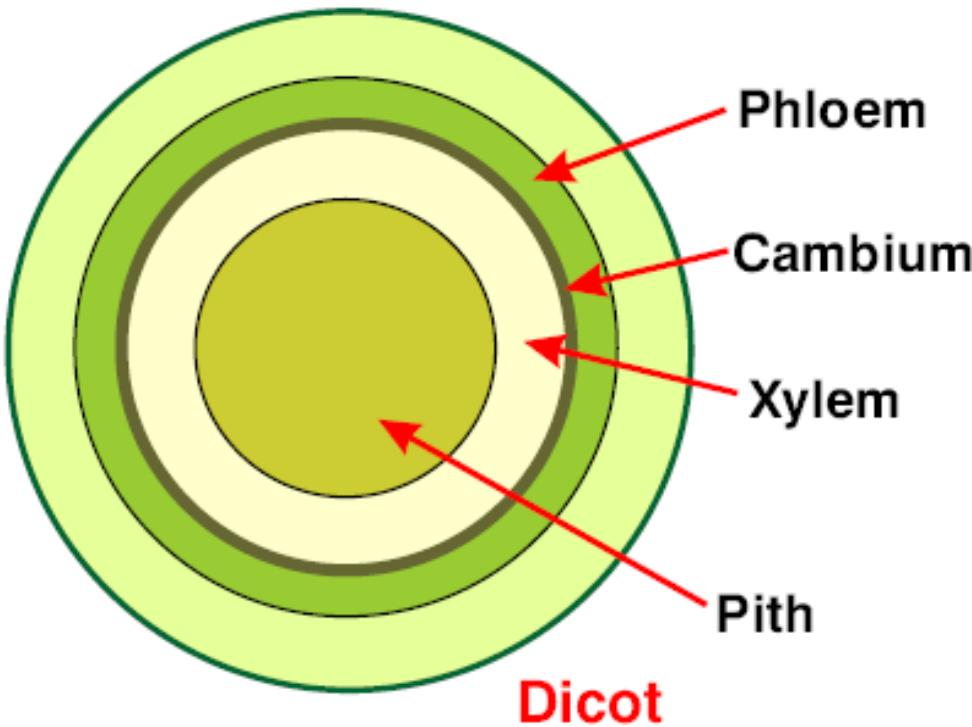
Bean Seed (dicot)



Corn Seed (monocot)



Monocot



Dicot



What Is the Difference Between Annuals, Biennials and Perennials?

- ❑ Plants are often classified based on their life cycles
- ❑ Even though gymnosperms and angiosperms reproduce by seed, there are different strategies for passing the seeds on to future generations





Annuals

- Plants grow from seed, flower, produce new seeds all in one season
- It dies after producing new seeds
- Have an **herbaceous** stem – green & fleshy
 - Ex. petunias, zinnias, and maize

Zinnia- *Zinnia elegans*

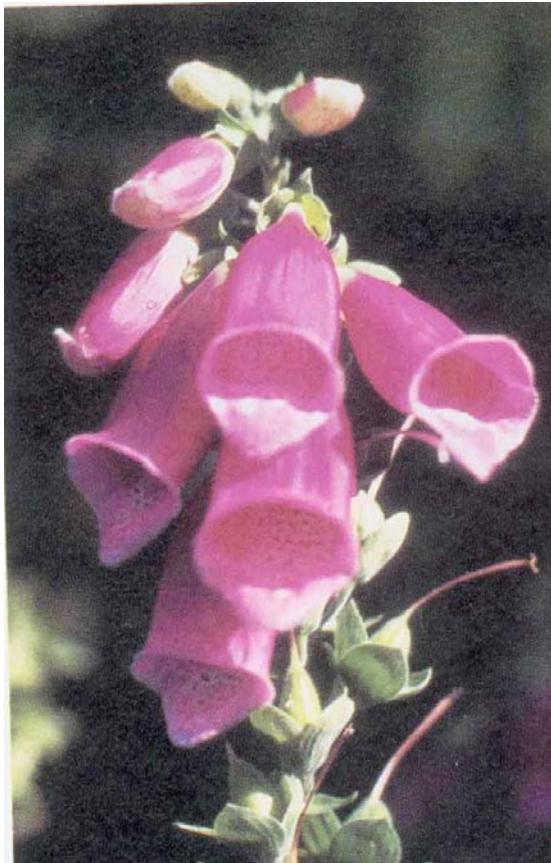


See life cycle

Biennials

- ☞ Plants that live for two years, then flower and die
- ☞ Food is produced during the first year, flowers the second year
 - Ex. Foxglove and carrots

Foxglove – *Digitalis purpurea*



See life cycle

Perennials



Tulip- *Tulipa hybrid*

- ☞ Plants that live for three or more years
- ☞ Flower for a short time
- ☞ Do not die after flowering
- ☞ Perennials do not usually have a predetermined age of death, some living for three or four years, some for over 1000
- ☞ Can be herbaceous or **woody** – having thick stems made of wood
 - Ex. Tulips, Irises, and trees and shrubs



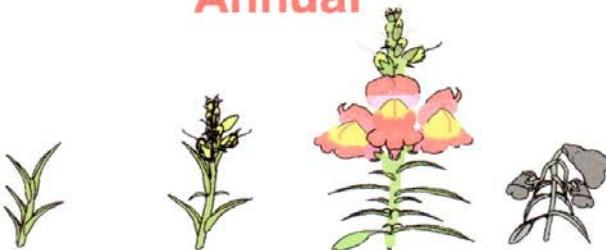
See life cycle

PLANT LIFE CYCLES



[Back to Annuals](#)

Annual



Germination---Growth---Flowering---Death



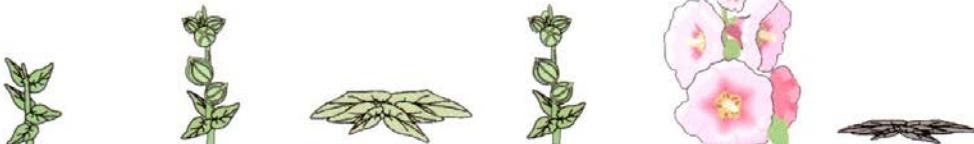
Germination---- Growth---Flowering---Dormancy

One or more flowering cycles



Back to Biennials

Biennial



Germination---Growth---Dormancy---Growth---Flowering---Death

Season 1

Season 2



Summary

- ❑ What is the difference between an angiosperm and a gymnosperm?
- ❑ How is a monocot different from a dicot?
- ❑ Are evergreens herbaceous or woody plants?



Summary Cont.

- ❑ What makes up the scientific name of a plant?
- ❑ Why are scientific names written in Latin?
- ❑ In what group would you find mosses? Describe their habitat.
- ❑ Describe the life cycle of a perennial.
- ❑ Name all 7 taxas in the classification system.