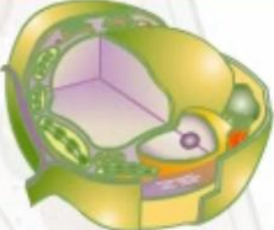



PLANTS	ANIMALS
Plants generally are rooted in one place and do not move on their own	Most animals have the ability to move fairly freely.
Plants contain chlorophyll and can make their own food	Animals cannot make their own food and are dependent on plants and other animals for food.
Plants give off oxygen and take in carbon dioxide given off by animals.	Animals give off carbon dioxide which plants need to make food and take in oxygen which they need to breathe.
Plants cells have cell walls and other structures differ from those of animals.	Animal cells do not have cell walls and have different structures than plant cells
Plants have either no or very basic ability to sense.	Animals have a much more highly developed sensory and nervous system.

Plant cells	Animal cells
	
They have a rigid, non-living cell wall that lies outside the cell membrane and is made up of cellulose	There is no cell wall
A plant cell contains plastids	Plastids are absent
Centrosome is absent	Centrosome is present near the nucleus
Lysosomes are absent	Lysosomes are present
Contains large and central vacuoles	Contains small and few vacuoles

Plastids are organelles in plant cells where important chemical compounds are manufactured and stored.

Centrosome is an organelle in animal cells comprised of microtubules and used as a cell organizing center and to regulate cell division.

Lysosomes are spherical animal cell organelles used to break down various biomolecules for cell use. They contain as many as 50 enzymes for this purpose.

Vacuoles are water-filled organelles and have varied use depending on the type of plant or animal cell.

Cellulose, a polysaccharide organic compound, $(C_6H_{10}O_5)_n$ (similar to chitin) makes up the cell wall in plants providing structure to the cell and protection of the organelles inside.

Kingdom Plantae

- Plants are generally distinct from other kingdoms by obtaining their energy to grow and thrive from sunlight via photosynthesis.
- Fungi and some algae are not in the Plantae kingdom.
- Best estimate is that there are between 300,000-315,000 plant species on earth today.
- Most of the world's molecular oxygen is produced by plants, their role in global ecology can not be understated.
- Fungi and brown algae are not plants as they do not generate energy in the same manner
- Earliest “plant-like” species are Cambrian algae, but these may not be true plants.
- Some evidence exists for Ordovician plants, but by the Silurian land plants. The first tree like plant came in the Devonian.
- The massive coals of the world are products of prolific plant of the late Paleozoic (Mississippian-Pennsylvanian-Permian), and to a lesser extent, the Mesozoic Era.

You are responsible for 10 individual Genus of plants in 6 different Phylums

Phylum Anthophyta (plants with flower-bearing structures)

Genus *Acer* – maples

- Over 120 species
- deciduous



Phylum Anthophyta

Genus *Populus* – poplars, aspen, cottonwood



Phylum Anthophyta

Genus *Platanus* – sycamores

First appeared in Cretaceous (115 MYA)

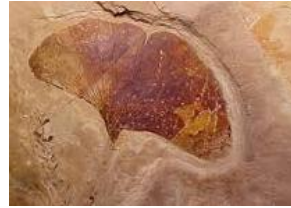


Phylum Ginkgophyta

Genus *Ginkgo*



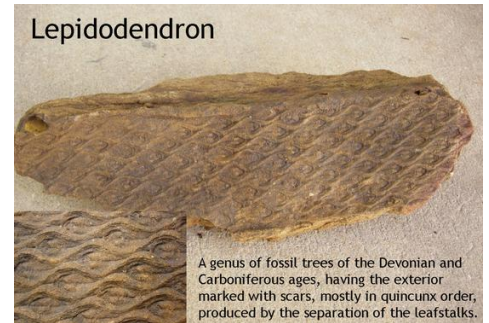
- First appeared in Permian (270 MYA)
- Lots of Mesozoic species and diversity
- One living species today, wild in China, cultivated elsewhere



Phylum Lycopodiophyta

Genus *Lepidodendron* (scale tree)

- Extinct, thrived in Carboniferous
- key component of coal forest flora
- Characterized by diamond shaped trunk/stem pattern through which CO₂ diffuses into the plant
- Up to 1m trunks



Phylum Pinophyta -- *conifers*

Genus *Metasequoia*

- Phylum of conifers (i.e. they bear cones which hold seeds)
- First conifers in Pennsylvania (300 MYA)
- Thrived into the Eocene in North America
- Today, Metasequoia are only in China and not the US redwood or sequoia. It is also deciduous



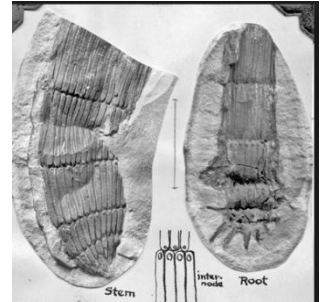
98) Phylum Sphenophyta (horsetails)

- Reproduce and disperse via spores, producing neither seeds or flowers



99) Genus *Calamites* (horsetail)

- Genus of extinct horsetails (360-300 MYA)



100) Plant leaf: *Annularia*

The leaf whorls of an *Calamites* are called annularia



Phylum Pteridospermatophyta (seed fern) Genus *Glossopteris*

- The term Pteridospermatophyta (or "seed ferns") refers to several distinct groups of extinct seed-bearing plants
- They go back to the Devonian.
- Glossopteris is the largest and best known Genus, and were around in the Permian in the southern Hemisphere
- Leaves are tongue shaped



Fossils of the gymnosperm *Glossopteris* (dark green) found in all of the southern continents provide strong evidence that the continents were once amalgamated into a supercontinent **Gondwana**

Phylum Pteridophyta (true ferns)

Genus *Psaronius*

(form: leaf genus: *Pecopteris*)

- Late Devonian to Early Permian
- Often found inside nodules eroded into creeks in Ohio, Ind, Ill.
- ***Pecopteris*** is a very common form genus of leaves.
- Note paired leaves off central stem.
- Most *Pecopteris* leaves and fronds are associated with the tree fern *Psaronius*.
- Name is derived from Greek word pekin which means comb, based on shape of leaves.

