## Non-Vascular Plants

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|---|---|
| character-istics | lack vascular tissue - nutrients travel by diffusion |
| Non Vascular Plant Groups | mosses (bryophyta) - Hornworts (anthocerophta) - Liverwort (hepaticophyta) |
| mosses | simple photosynthetic leaf like structures, and re a major component of **peat** which is used as fuel |
| Hornwort | one large chloroplast per cell, symbiotic relationship with cyanobacteria |
| Liverwort | groundcovers that grow parallel to the ground, one of the simplest plants |
| environment | they grow in very dark, moist areas |

## Vascular Seed Plants

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| Gymnosperms | have naked seeds not enclosed in a fruit |
| Gymnosperm Types | Coniferophyta - Ginkophyta - Gnetophyta - Cycadophyta |
| Cycadophyta | delicate stems with storge tissue |
| Gnetophyta | produces Ephedrin that is used in decongestants and antihistamines |
| Ginkophyta | fan shaped leaves - foul odor |
| coniferophyta | evergreen trees that have needle like leaves |
| Angiosperm | have seeds enclosed in a fruit |
| Angiosperm Classification | Monocotylodons (petals in multiples of 3) - Dicoty-lodons (flowers in multiples of 4 or 5) |

## Plant Tissue

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|---|---|
| types of plant tissue | meristematic - dermal - vascular |
| **meristematic tissue** | contains cells that divide actively in the plant's lifetime |
| types of merist-ematic tissue | Apical Meristems - Intercalary Meristems - Lateral Meristems |
| Apical Meristems | specialized zones of growth in the tips |
| Intercalary Meristems | responsible for growth after trimming |
| Lateral Meristems | responsible for growth upwards (shoot) and downwards (root) |
| **Dermal Tissue** | trichomes - Stomata - Root hairs |
| trichomes | produce a barrier against nature |
| Stomata | small openings that allow the transfer of materials inside and outside the leaves |
| **Vascular Tissue** | Xylem - Phloem |
| Xylem | transport of water and materials |
| Phloem | transport of carbohydrates |

## Flowering Plants

| | |
|---|---|
| flower | the main reproductive organ |
| components | sepal - petal - stamen - pistil |
| sepal | green and protect the flower |
| petal | colorful and attract pollinators |
| stamen | male reproductive organ made of filaments and anther, and produce pollen |
| pistil | female reproductive organ made of the ovary, style, and stigma |
| stigma | pollen destination site |
| style | forms a tube connecting the stigma and ovary |

## Seedless Vascular Plants

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|---|---|
| Character-istics | larger than nonvascular plants - vascular bundle present (phloem and Xylem) - have a strobilus - reproduce through spores |
| Lycophyta | are epiphytes - remains are used as fuel |
| Lycophyta types | Selangiella - Lycopodium |
| Pterophyta | include dryopteridacae (wood ferns) and Equisetacae (horsetails) |
| wood ferns | short gametophyte stage - spores may develop without fertiliztion - gametophytes are very small - sporophytes form rhizomes (underground stems for storage) |
| horsetail | contain silica - hollow stems with scaly leaves |

## Plant Cells

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|---|---|
| Characteristics | cell wall present - contain chloroplast |
| Cell Types | Parenchyma - Collenchyma - Sclerenchyma |
| parenchyma cells | can divide and repair - store substances - have chloroplasts |
| collenchyma cells | can divide - provide elasticity and rigidity |
| Sclerenchyma | cannot divide (dead cells) - provide support - aid in transport |
| Sclerenchyma subtypes | fibres - sclereids |

## Plant Hormones

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|---|---|
| Auxin | first hormone discovered - responsible for apical dominance - produced in active apical areas |
| Ethylene | the only gaseous hormone - affects fruit ripening - transported by phloem |
| Gibber-ellins | transported by vascular tissue - promotes cellular elongation - affects germination of seeds - dwarf plants lack gibberellins |
| Cytokinin | promotes growth |

## Responses

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| Nastic response | temporary responses to external stimuli (venus flytrap closing) |
| Tropism | the directed movement of a plant in response to a stimulus (positive = towards stimulus, negative = away) |
| types of tropism | phototropism - gravitropism - thigmotropism |
| thigmo-tropism | growth in response to contact |

## Structural Differences in Flowering Plants

| | | |
|---|---|---|
| Complete | has all 4 components of a flower | |
| Incomplete | lacks one or more component | |
| Perfect | contains both male and female organs | Ex: sunflower |
| Imperfect | contains only one reproductive organ | Ex: Palm Tree |
| Monocots | trimerous | |
| dicots | tetramerous or pentmerous | |