

NOTES FOR THE MIGHTY PLANTOFE

(DO NOT LOSE! SAVE FOR THE OFE)

Name: _____

New Area of Focus: Evolution of Plants.

Image has been removed to decrease .pdf download time. The hardcopy will contain a visual of plant evolution

New Area of Focus: Algae.

- Part of Non-vascular plants.

Algae -Why they are important! They are food, and make oxygen.

- Most primitive members of Plant Kingdom.
- They are photosynthetic. They make food from the sun.
- Algae can be found as bacteria, protists, and plants.

New Area of Focus: Lichens.

- It has some algae in it.

Lichen: Algae and fungus growing together in a symbiotic relationship.

- The fungi extract food from the environment, while the algae are photosynthetic. This is mutualistic symbiosis.

The three types of lichens

- Crustose: Forms a crust, difficult to remove without crumbling.
- Foliose: Leafy, can be peeled off rock with knife.
- Fruticose: Forms shrubby branches. Easily removed by hand.

New Area of Focus: Bryophytes / Non-Vascular Plants.

Non-vascular plants....

- Lacks tubes (vascular tissues) in the plant to bring water and food up and down.
- Do not produce seeds or flowers.
- Are very short because they lack the woody tissue necessary for support on land.
- Bryophytes: Division of non-vascular plants that have no roots, stems, or leaves and transport nutrients using diffusion.

Bryophytes include...

- Mosses.
- Liverworts
- Hornworts



New Area of Focus: Seedless Vascular Plants.

Ferns: Flowerless and seedless vascular plant, having true roots from a rhizome, and fronds that uncurl upwards; and reproduces with bisexual spores.

New Area of Focus: Seeds

Seed: (Easy) A baby Plant.

Seed Coat: Protects seed from drying out, aids in seed dispersal, open's when conditions are right.

Seed Dormancy: A period when the seed doesn't grow.

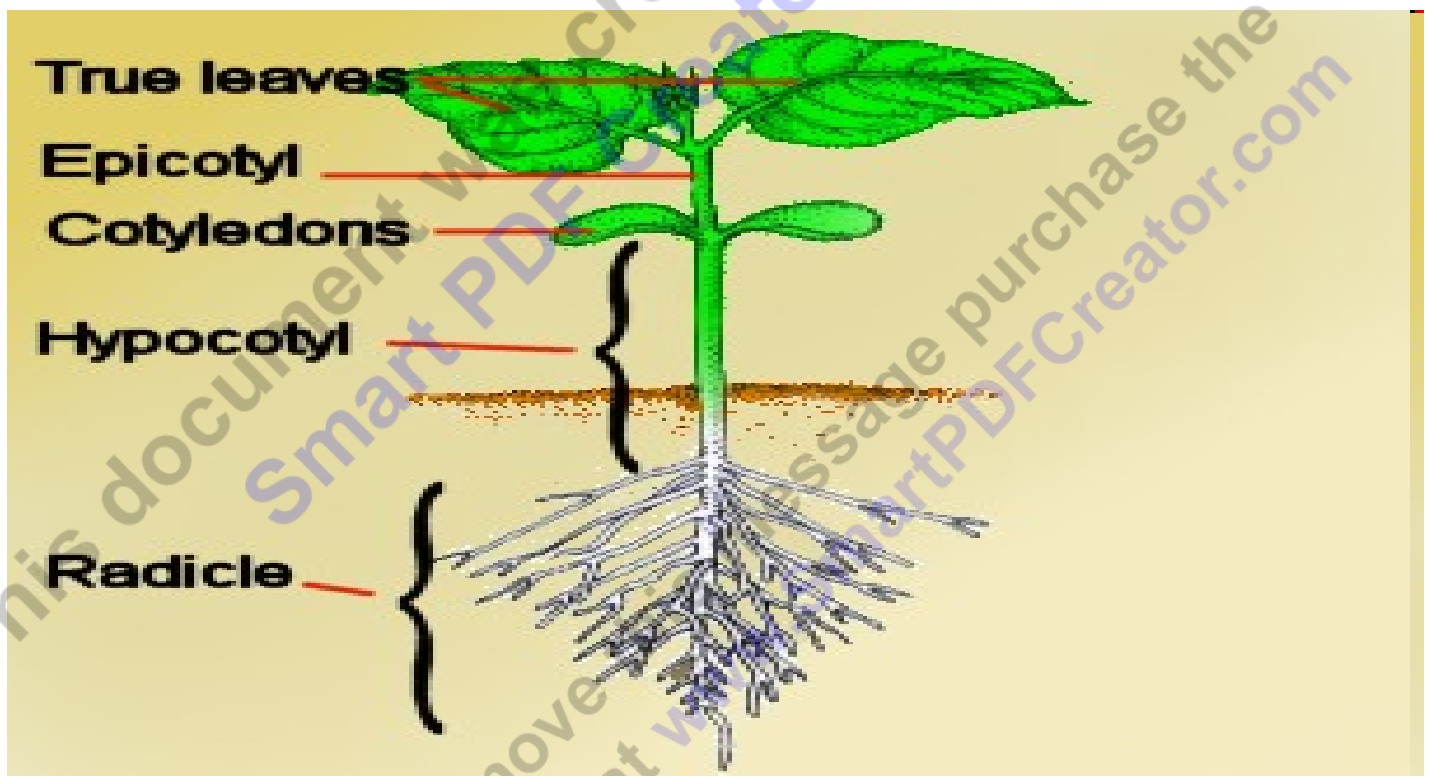
Factors that break seed dormancy.

- Mechanical Abrasion.
- Digestion processes of animals.
- Temperatures - Warm and Cold + Fire.
- Water

Germination: The process whereby growth emerges from a period of dormancy.

New Area of Focus: Parts of a young plant / seed.

Cotyledon: First leaves (Full of energy).



Radicle: Lower embryo and root.

Gravitropism: Response of a plant in relation to gravity. Roots go down, shoots go up.

Hypocotyl: Part of the plant between the radicle and cotyledons.

Epicotyl: The stem of a seedling or embryo located between the cotyledons and the first true leaves.

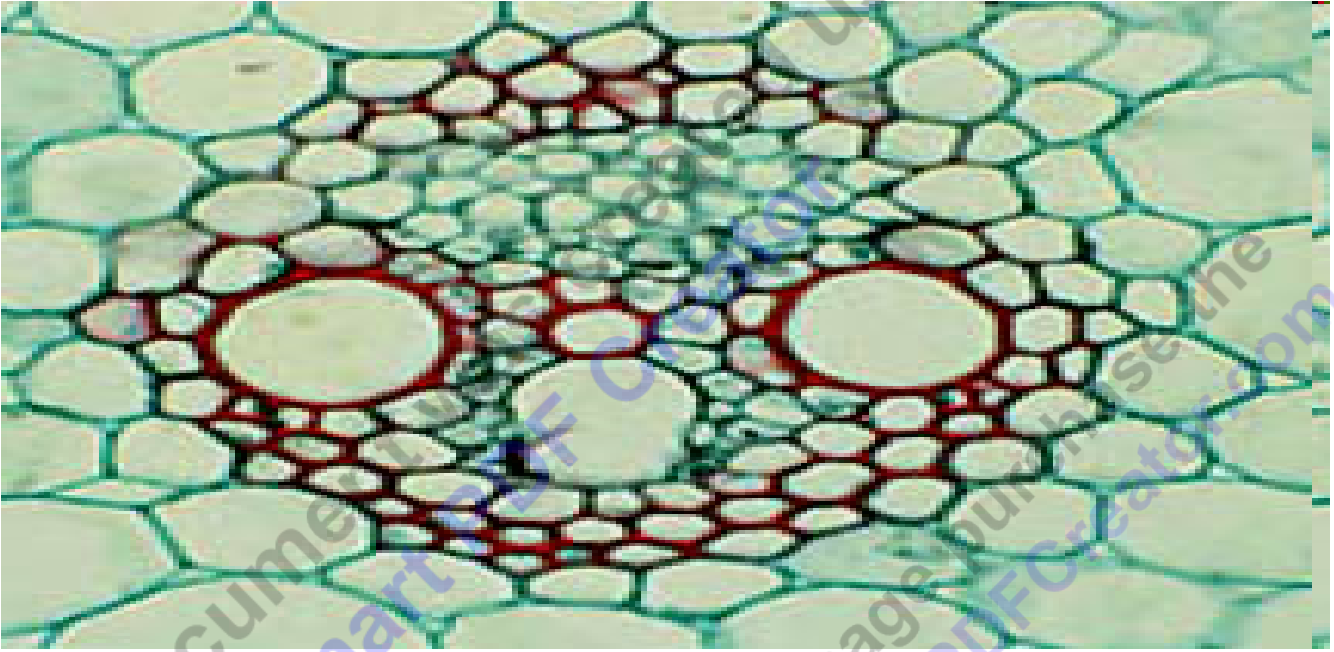


New Area of Focus: Monocots and Dicots.

Monocotyledons

- Seedling has one cotyledon
- Veins in leaf are parallel.

- Flower petals are in 3's.
- Never woody.
- Vascular bundles are scattered.



Monocot Man

Dicotyledons

- Veins on leaf are branched.
- Flower parts are groups of 4 to 5.
- Secondary growth can be woody.
- Vascular bundles are in a ring.

New Area of Focus: Roots and Water.

Roots: The usually underground portion of a plant that lacks buds, leaves, or nodes and serves as support, draws minerals and water from the surrounding soil, and sometimes stores food.

There are two types main types of roots.

- Taproot: (Draw) Main root with roots that branch off.
- Fibrous root: (Draw) Many branches.

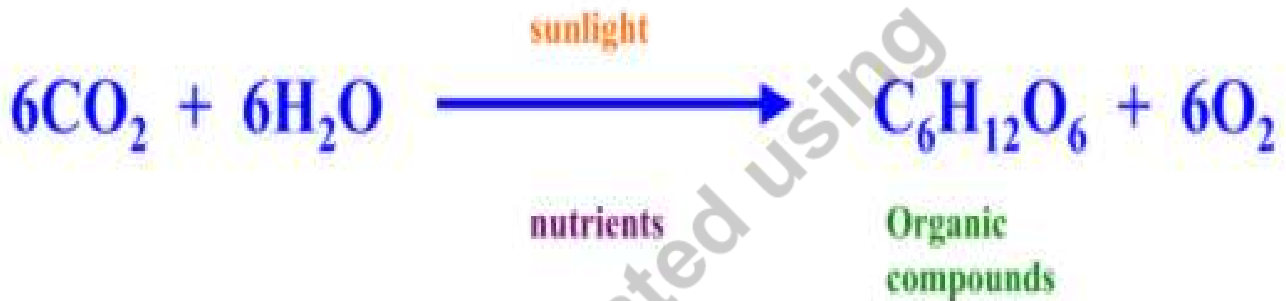


Other roots can be tubercular. (Tubers)

Root Hairs - Hairlike extensions of root to absorb water and nutrients.
Very delicate (damaged when transplanted).

Water uptake is necessary for plants because...

- Water is needed for photosynthesis.



- Keeps plants rigid and not wilted. Water fills cells and creates turgor pressure.
- Water cools the plant down during warm weather.
- Water carries dissolved nutrients and minerals throughout plant.

New Area of Focus: Plant Hormones.

Plant hormones are chemicals that affect aspects of the plants life.

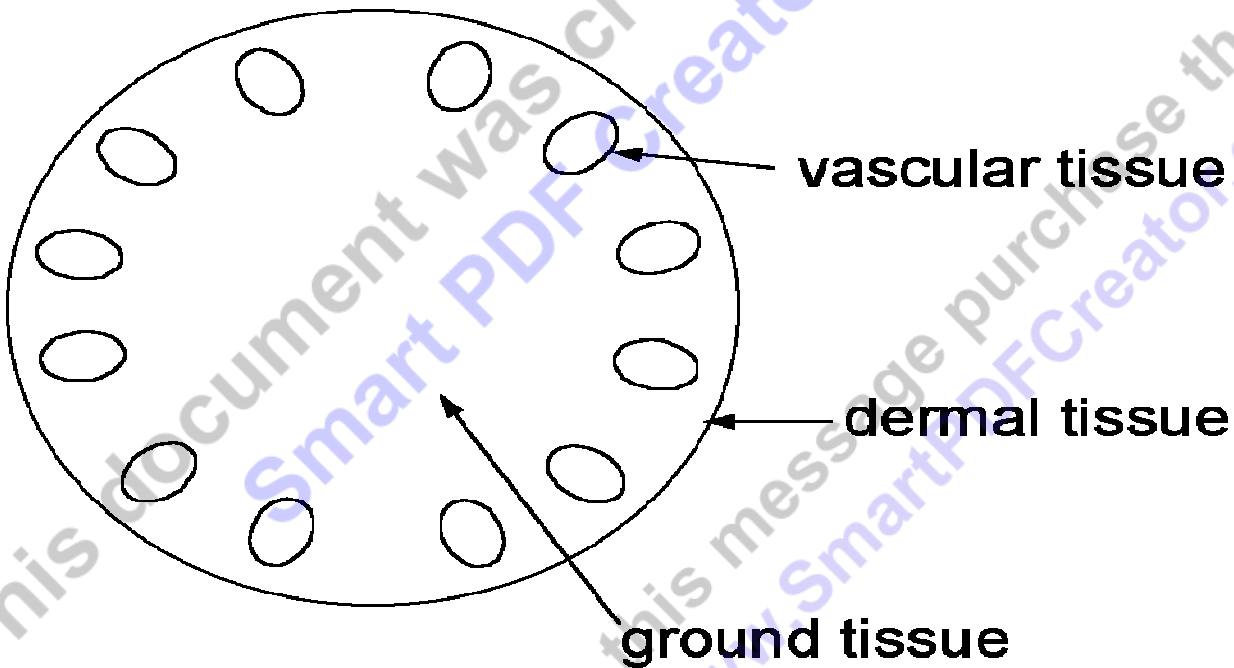
Some plant hormones.

- Auxin: Promotes stem elongation and bud dormancy.
 - Phototropism: When plants grow toward a light source.
- Gibberellins: Make stems longer.
- Cytokinins: Promotes cell division. They are produced in growing areas like the tips.
- Abscisic Acid: Opens and closes stomata, has role in seed dormancy.
- Ethylene: A gas that promotes fruit ripening.

New Area of Focus: Plant Tissues and Vascular Systems.

3 types of plant tissues.

- Dermal tissue: Outside layer of plant, protects, interacts with outside.
- Ground Tissue: Below dermal tissue, stores energy, photosynthesis occurs here.
- Vascular Tissue: Xylem and Phloem.



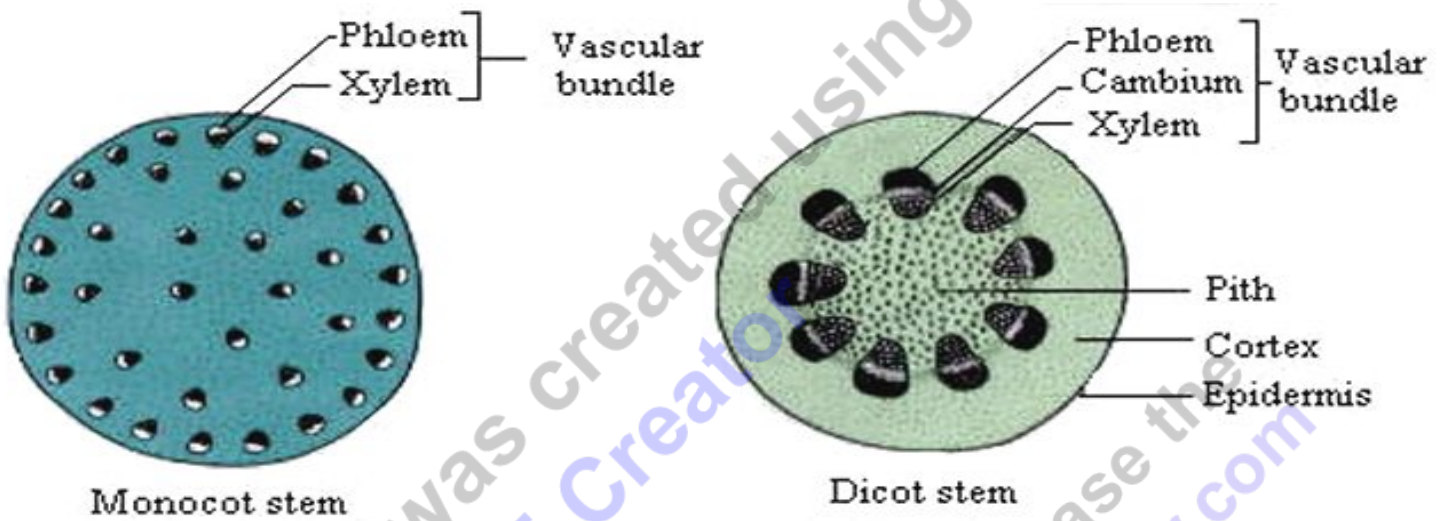
Vascular system: The vessels and tissue that carry or circulate fluids such as blood or lymph or sap through the body of an animal or plant.

Xylem: (Zi-lem).

- Tubes that water and minerals move through.
- Water travels up the tree from roots to leaves.
- Old xylem doesn't transport water but supports plant. (Xylem is wood).

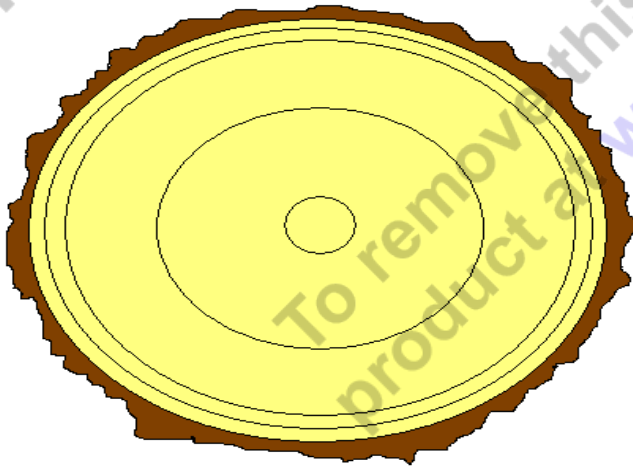
Phloem: (Flow-em).

- Tubes in the plant that food (sugar) moves through.



New Area of Focus: Woody Plants.

Draw the following



Pith: The soft spongy substance in the center of the stems of many plants and trees. Wood formation begins here.

Heartwood: Older, Darker, and harder non-living central portion of the tree.

Sapwood: Living wood, lighter in color, conducts water with xylem.

Cambium: Area just inside bark that makes new tissues. Adds girth which allows the plant to grow tall.

Dendrochronology: The dating of past events through study of tree ring growth.

Inner Bark: Area just inside the bark, made of living tissue and contains the phloem.

Outer bark: Outside of tree, provides protection.

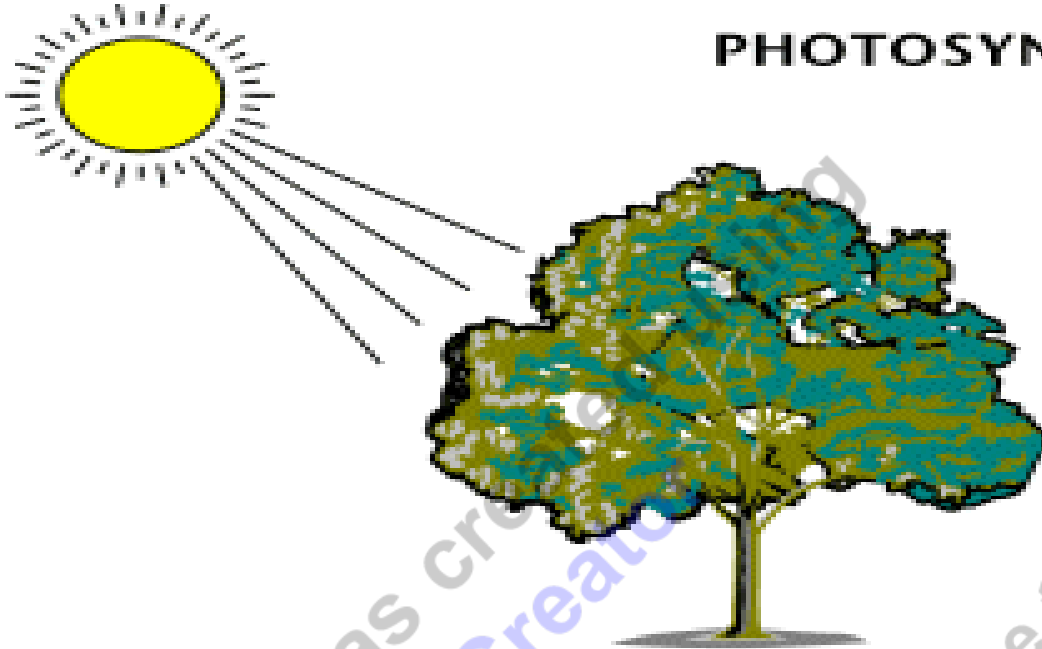
New Area of Focus: Leaves

A leaf is a plant organ, that is photosynthetic, contains chloroplasts, and is usually thin so light can penetrate.

The big three aspects of light and plants.

- Quality (how good)
- Quantity (how much)
- Duration (how long)

PHOTOSYNTHESIS



In the process of photosynthesis, plants convert radiant energy from the sun into chemical energy in the form of glucose - or sugar.



Transpiration: The evaporation of water from plants.

- It occurs during photosynthesis.
- Helps pull water up the xylem from roots.
- Cools the leaf.

Guard Cell and Stoma: Openings in leaf (stoma) controlled by guard cells that allow gases in and out of leaf.

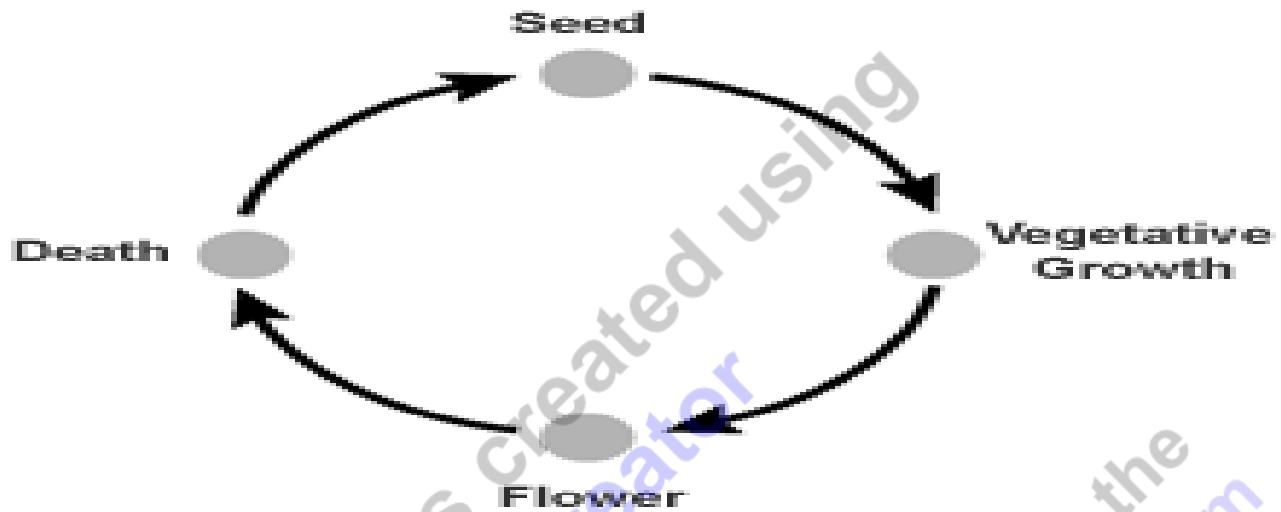
New Area of Focus: Leaf Identification.

No notes for this section. Do leaf rubbings.

New Area of Focus: Plant Life Cycles.

Annuals: Seed germinates, grows, and produces new seed, before dying.

Annual Growth Cycle



Biennials: Plant lives through first winter and produces seed before dying.

Perennials: Plants that live for many years producing seeds each year.

Deciduous: Plants and shrubs that lose leaves in fall and grow them back in spring.

Seed Plant Life Cycles.

- All plants undergo sexual reproduction (two partners). When the sperm and egg come together you get a zygote / baby plant.
- *Gymnosperm:* Non-flowering, seeds usually arranged on a cone.
- *Angiosperm:* Flowering, covered seed, produce seeds enclosed in a fruit /ovary.

Flower: The reproductive organ of a plant that makes the seed.

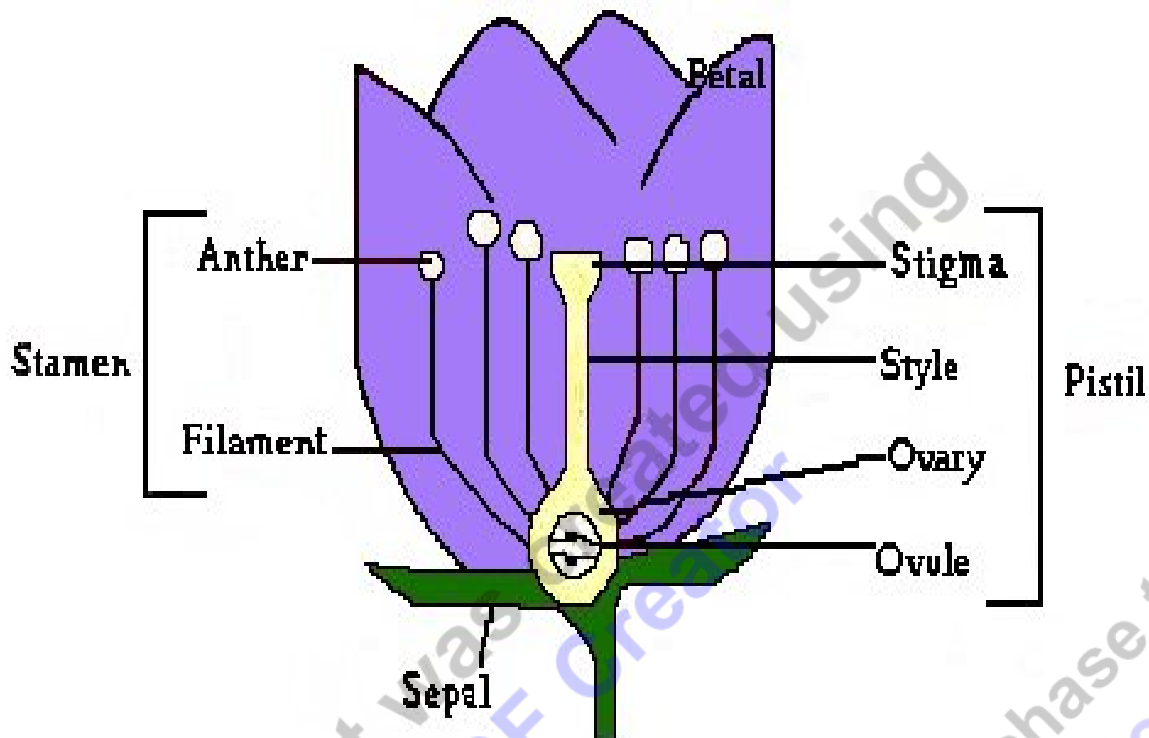
Area of Focus: Parts of a Flower.

Stamen - Male part of flower (sperm).

- Filament: Supports the anther.
- Anther: Part of the stamen that holds the pollen.
-

Pistil: Female part of flower (egg).

- Stigma: Sticky bulb in the center of the flower. Receives the pollen grains.
- Style: Long stalk that the stigma sits on top of.
- Ovary: On bottom of the flower, has the seeds inside and turns into the fruit. Contains the ovules.
- Ovule: The part of the ovary that becomes the seeds.
- Petal: The colorful, often bright part of the flower. They attract pollinators and are pretty 😊.
- Sepal: Green leaves that cover the outside of a flower bud to protect the flower before it opens.



New Area of Focus: Matured Ovaries (Fruits)

Fruit: The matured ovary in the pistil. Contains the seed.

Parts of a fruit.

- Exocarp: Outer covering of the fruit. "skin"
- Mesocarp: Middle covering. "Flesh"
- Endocarp: Inner covering, the stiff area around the seed. "Stone" "Pit"

Types of fruit

- Simple Fruits - Develop from one pistil
 - Orange
 - Corn
 - Apples
 - Rice

- Acorn

Aggregate Fruits: Develop from flowers with many pistils.

- Raspberry
- Blackberry

Multiple Fruits: Form from a cluster of several flowers.

- Pineapple

Dehiscent: A dry fruit that splits at maturity releasing the seeds.

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