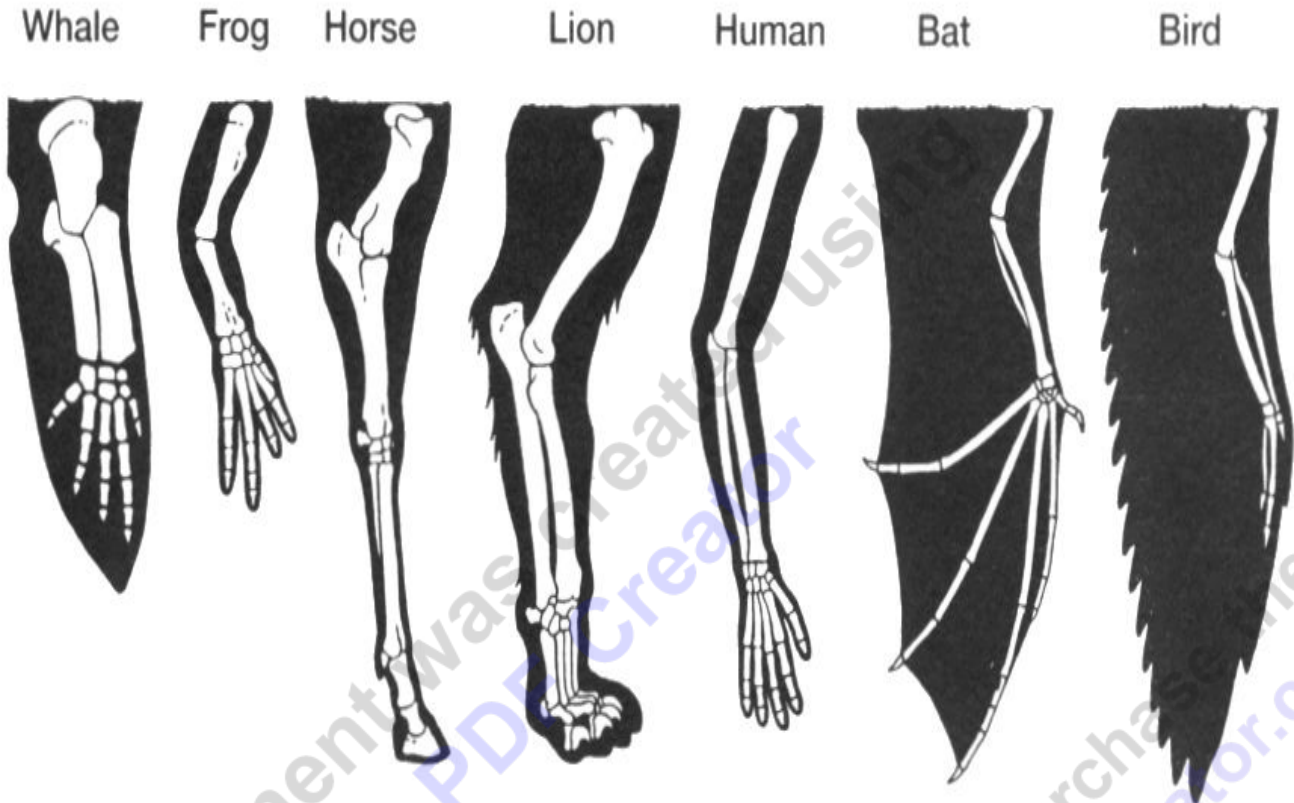


Taxonomy and Classification Unit Notes

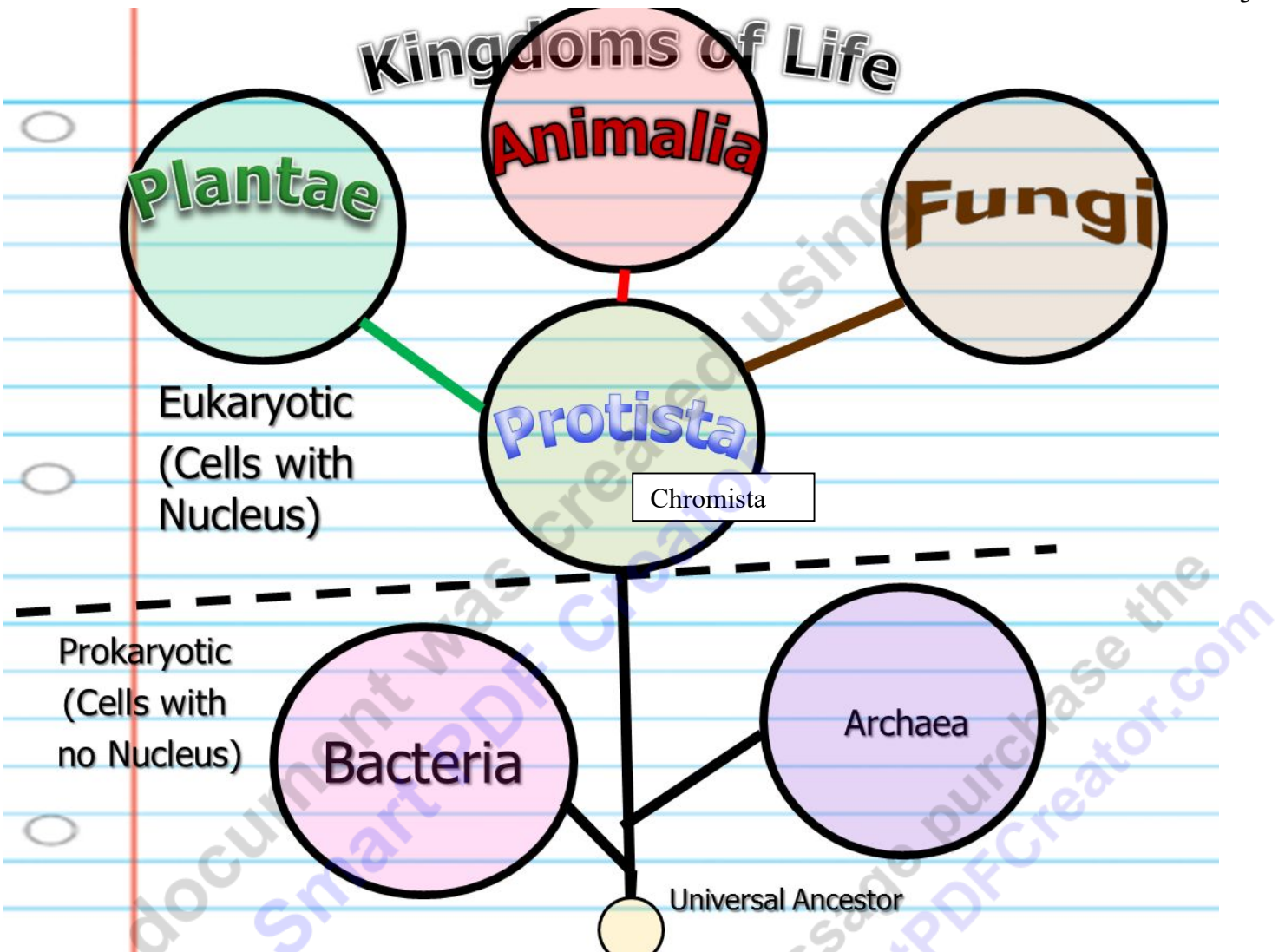
Name:

(DO NOT LOSE, BRING TO CLASS EVERYDAY)

- Taxonomy: The science of classification.
- Classification is a very broad term which simply means putting things into groups.
 - Taxonomy means giving names to things.
- A species is...
 - A group of organisms with similar characteristics.
 - Produce fertile offspring.
 - Similar DNA.
 - Phylogeny -The history of a species as they change through time. Who came from whom?
- Dichotomous key: A tool that allows the user to determine the identity of items in the natural world.
- Based on characteristics and uses process of comparison and elimination.
- Classification uses...
- Homology – Similarities between organisms



-
- Adapted traits may further subdivide species into subspecies. *Canis lupus arcticus*.
- The 3 domains of life. All life is either...
 - Archaea
 - Bacteria
 - Eukarya
- The Kingdoms of life. All life belongs to one of these.



Domain	Bacteria	Archaea	Eukarya			
Kingdom	Bacteria	Archaea	Protista	Plantae	Fungi	Animalia
Cell Type	Prokaryotic (No nucleus)	Prokaryotic (No nucleus)	Eukaryotic (Nucleus)	Eukaryotic (Nucleus)	Eukaryotic (Nucleus)	Eukaryotic (Nucleus)
Single or Multi-Cellular	Single (Unicellular)	Single (Unicellular)	Single (Unicellular)	Multicellular	Multicellular	Multicellular
Gets Energy from..	Varies	Varies	Varies	Sunlight	Absorbs	Consumes Food

- The 8 Taxonomic ranks. All living things have 8 names.

- 1) Domain - Did
- 2) Kingdom - King
- 3) Phylum - Phillip
- 4) Class – Come
- 5) Order - Over
- 6) Family - For
- 7) Genus - Good
- 8) Species – Spaghetti

- Genus name is Capitalized, species name is not. They are both italicized.

- Ex) *Armadillidium vulgare*

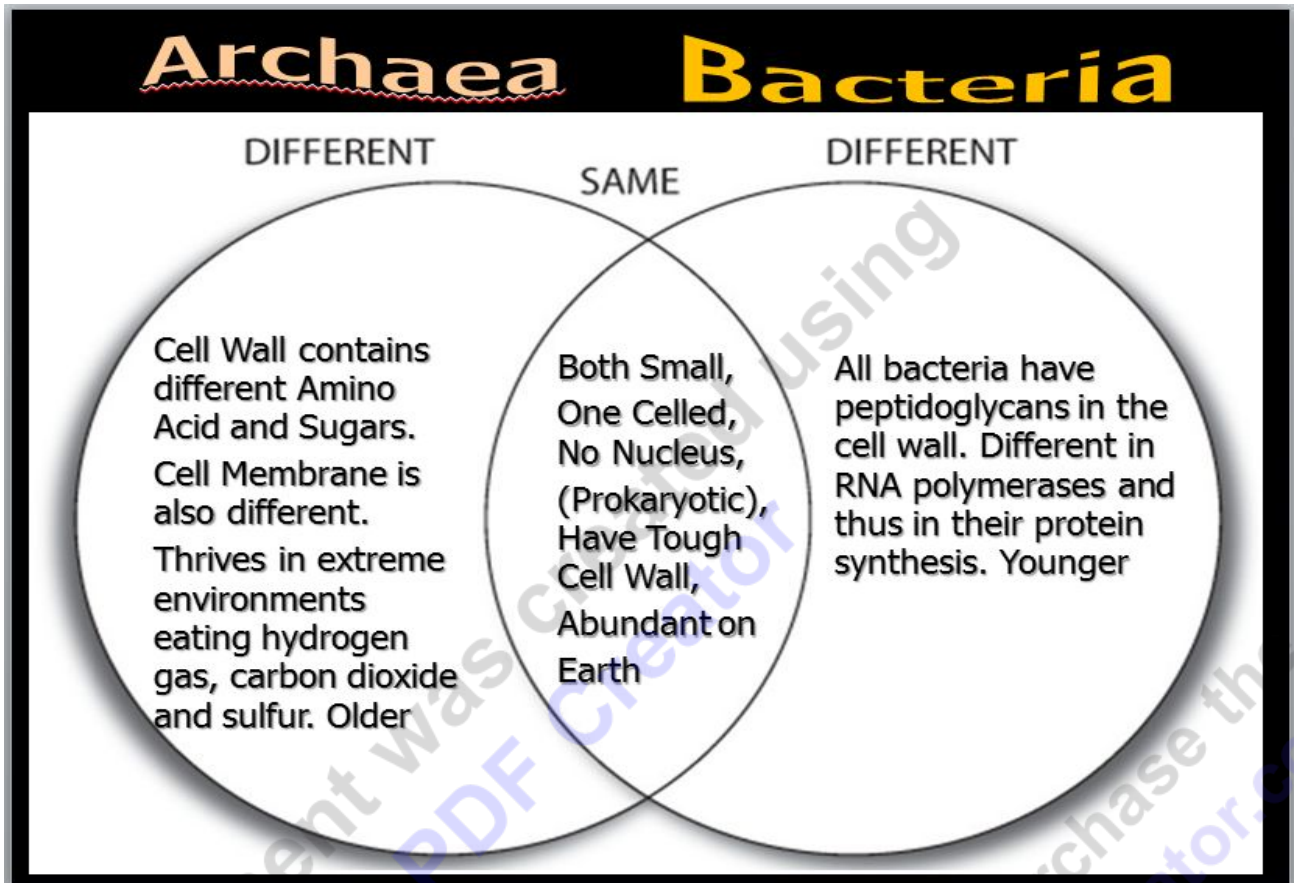


- Humans Taxonomic Classification

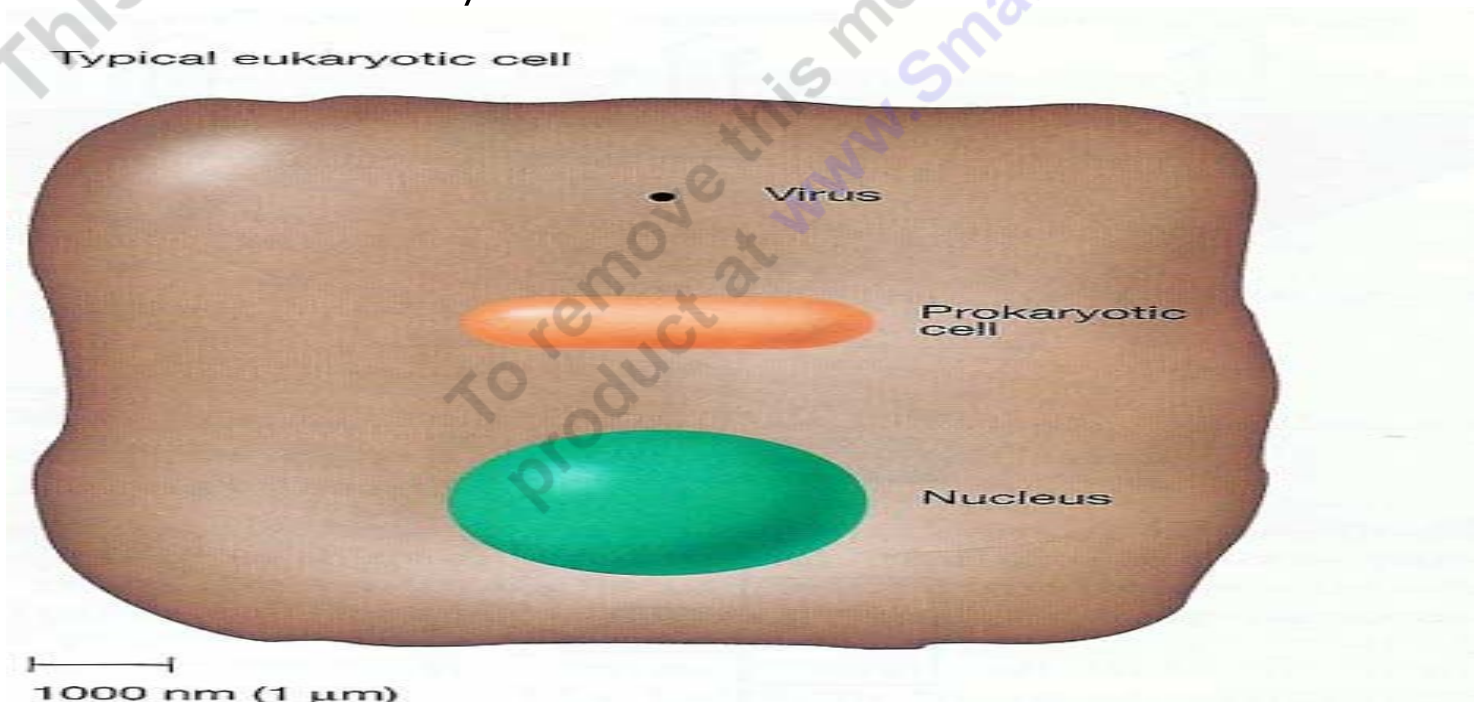
- -**Domain - Eukarya**
- -**Kingdom - Animalia**
- -**Phylum - Chordata**
- -**Class - Mammalia**
- -**Order - Primatdae**
- -**Family - Hominidae**
- -**Genus - Homo**
- -**Species – sapien**
 - **Subspecies - sapien**

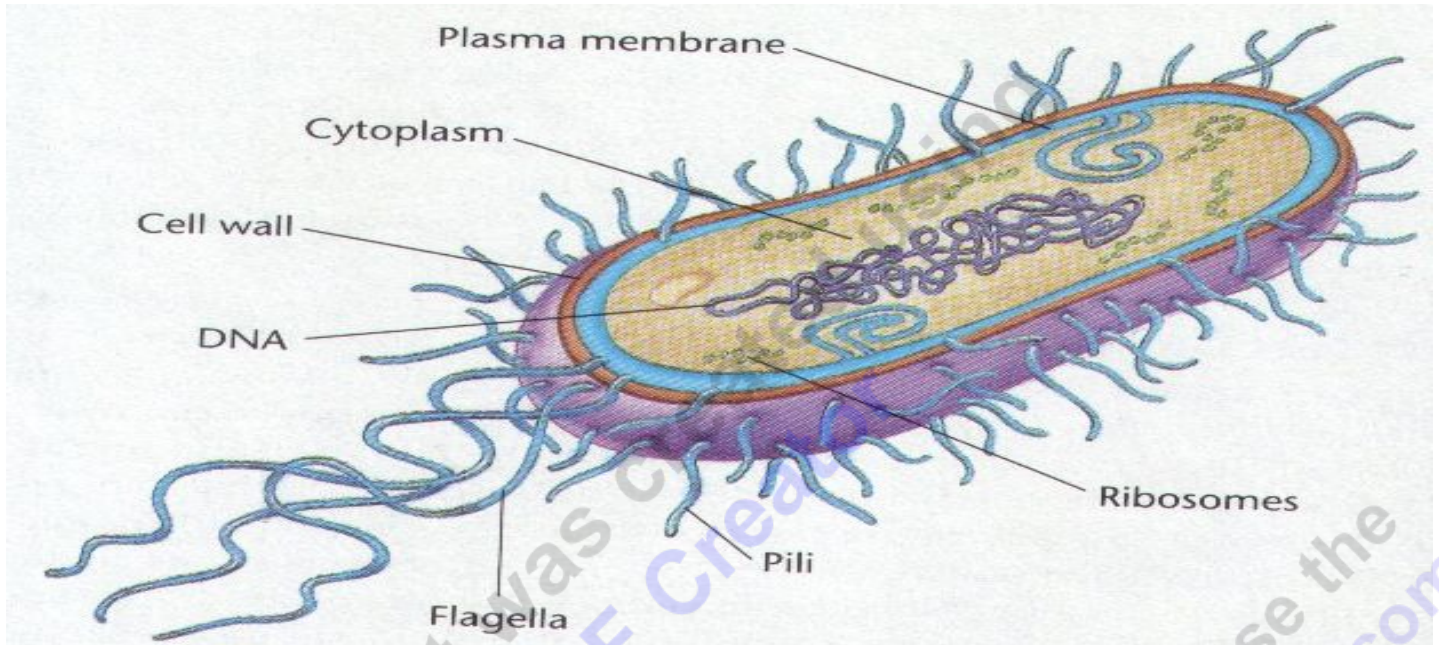
Area of focus: Archaea

- Archaea: Unicellular microorganisms that is genetically different from bacteria and eukaryotes.
 - Often inhabiting extreme environmental conditions.
- Archaea includes...
 - Halophiles (salty)
 - Methanogens (make methane gas)
 - Thermophiles (Thrive in hot)
 - Psychrophiles (cold)

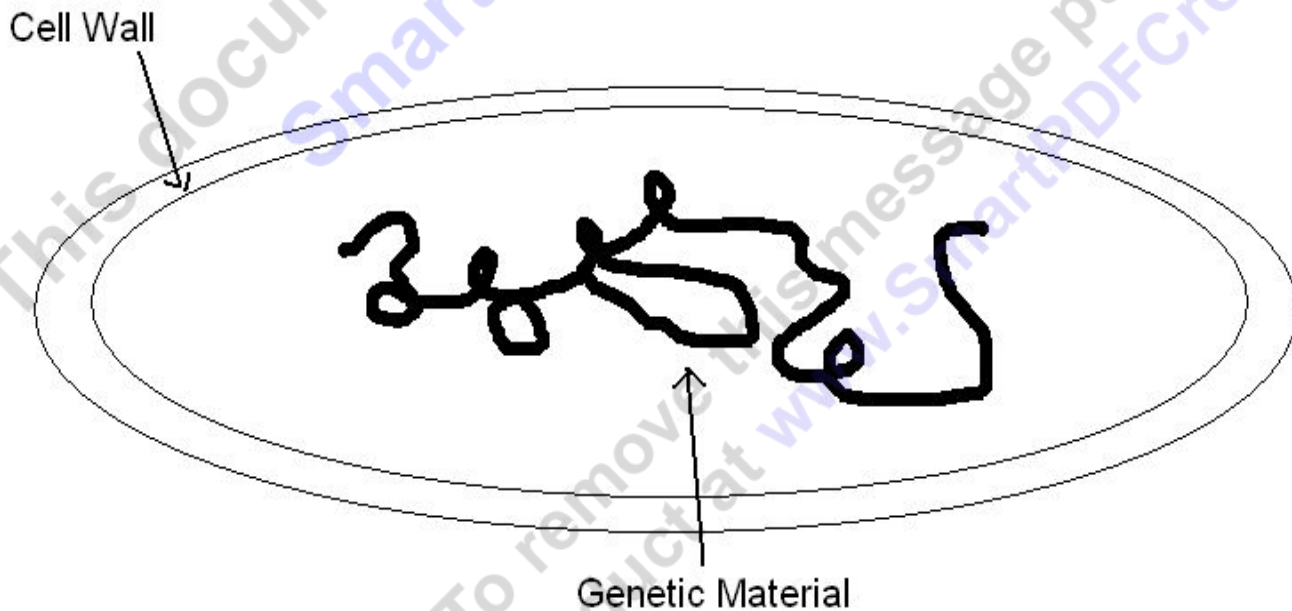


- Domain Bacteria is composed of microorganisms that are much more common than Archaea and live almost anywhere.





■ Prokaryotic (No nucleus) and no internal organelles.



■ Has a cell wall.

■ DNA floats in cell

● Two types (Domains):

- 1.) Archaea – old (Can be *extremophile*)
- 2.) Bacteria – true

● Bacteria – True bacteria, gets energy from food or sun.

■ Sphere (Round) Shaped – Cocci .

■ Rod shaped – Bacilli -

■ Spiral shaped – Spirilla ~

■ Vibrio: Comma Shaped , -

● Mycoplasma bacteria – smallest known life form (jagged and random).

■ Diplo = Pair ..

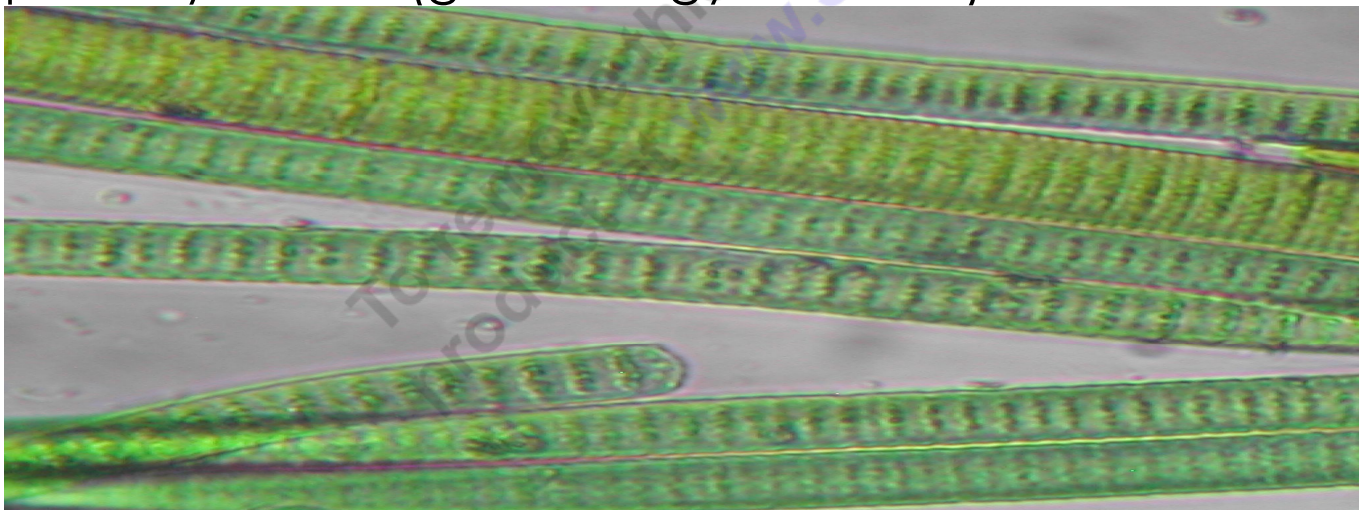
■ Tetrad = Groups of four ::

■ Sarcinae = Groups of Eight. ::::

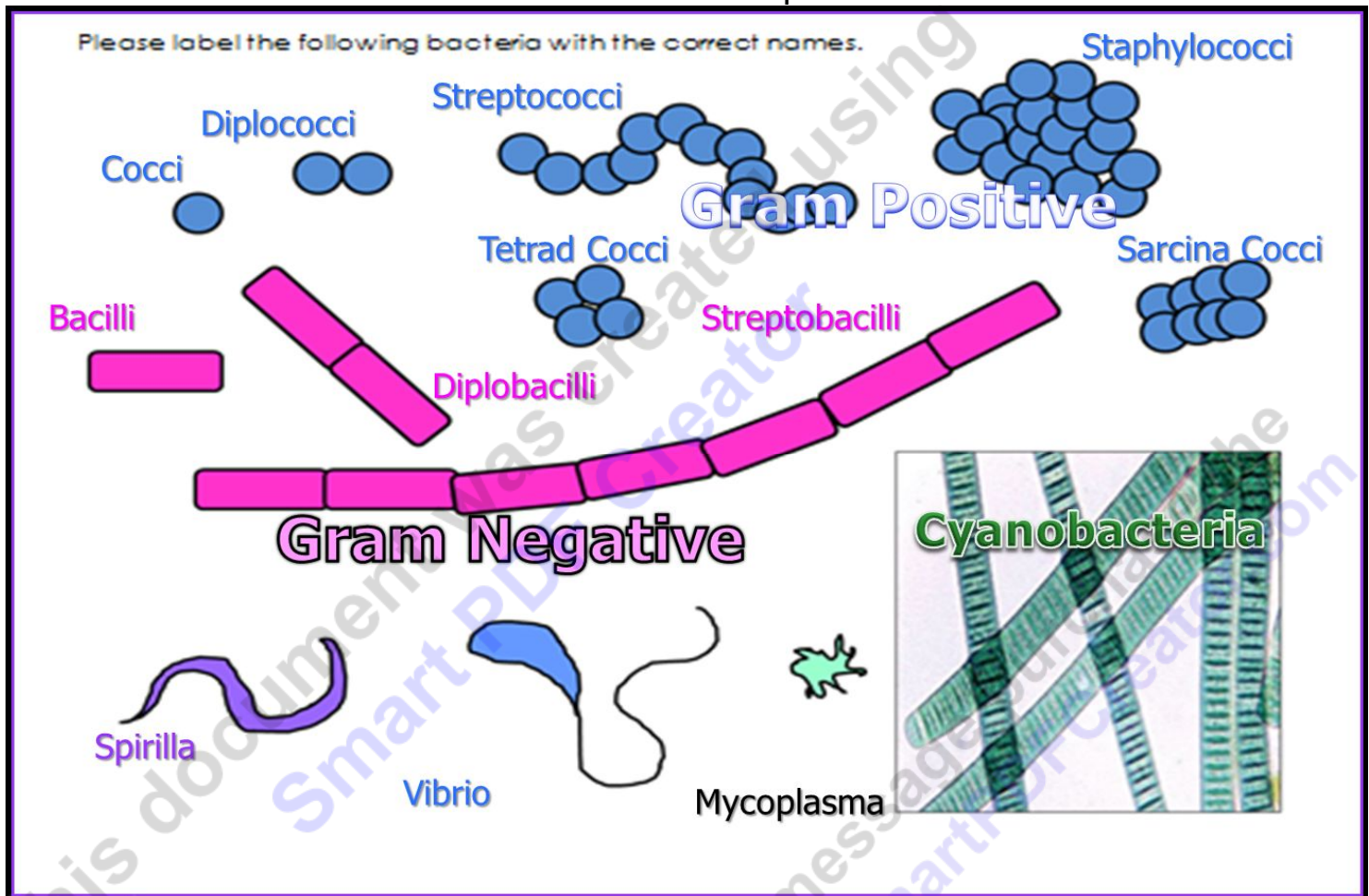
■ Staphylo = Cluster

■ Strepto = Chain -----

■ Cyanobacteria (no longer blue green algae). It's photosynthetic (gets energy from sun).



- Gram staining: Technique used to identify bacteria.
 - -Pink and Red: Gram Negative
 - -Gram Positive = Dark Purple



- Bacterial food borne illness can be prevented by....
 - -Controlling the initial number of bacteria present.
 - -Refrigeration – Prevents the small number of bacteria from growing rapidly.
 - -Destroying the bacteria by proper cooking.
 - -Avoiding re-contamination. Clean cutting board immediately after use.

- Penicillin: Antibiotic that destroys bacteria derived from penicillin mold (fungi).
- *Antiseptic* - agent that kills or inhibits the growth of microorganisms on the external surfaces of the body.
- Plaque is the accumulation of bacteria and microorganisms on a tooth.
- Tartar is dental plaque that has mineralized. Tartar can form when plaque is not removed from the tooth surfaces.
- Binary Fission: The process by which a bacterium multiplies by splitting in two.



- In asexual reproduction, one individual produces offspring that are genetically identical to itself.
- Sexual Reproduction: Genetic material from two different individuals combines into a genetically unique offspring.

Positives (+)

- Food Source
- Recycling waste
- Industrial
- Decomposition

Negatives (-)

- Health Problems
- Destroys Food

New Area of Focus: Eukarya

Domain Eukarya; Have cells with a membrane bound nucleus and membrane bound organelles.

New Area of Focus: Protista

- Protist – An organism with Eukaryotic Single cell, or colonies. Lacking tissues and eats, makes, or decomposes for food.
- Plant-like Protists (photosynthetic but no root stem or leaves)
 - -Green Algae
 - -Brown Algae
 - -Red Algae
 - -Diatoms
 - Round shells made of glass.
 - -Dinoflagellates
 - -Euglenoid
- Animal-like Protists (move, eat food, some use sun)
 - -Ciliates

- Cilia
- -Cilium / Cilia: A hairlike projection from the surface of a cell; provides locomotion.
- -Amoebas
- -Flagellates
- -Sporozoan (parasite)
- Fungus-like Protists (get energy from decomposing).
 - -Slime Mold
 - -Water Mold

Autrophic – Makes its food. (Photosynthesis, Chemosynthesis)

Heterotrophic – Eats food

Mixotrophic - A mixotroph is an organism that can use a mix of different sources of energy and carbon.

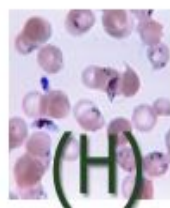
Saprotrophic - Feeding by extracellular (Outside of cell) digestion. Feeding on decayed organic matter



Green (A)

Green Algae, Photosynthetic, makes oxygen, uses carbon dioxide. Start of aquatic food chain.

Amoeba, Eats food, uses pseudopods to engulf prey. Shape shifter.



Sporozoans, Can be parasitic. Malaria is caused by a Sporozoan.

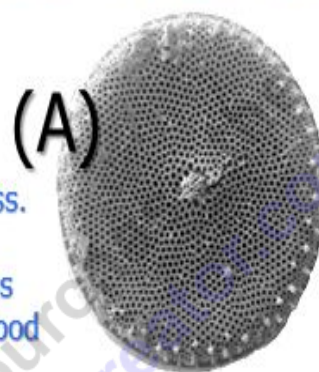


Dinoflagellate. Red Tide. When dinoflagellates bloom in the ocean. Can have negative impacts. Kills fish and creates neurotoxin in shellfish if we eat them.



Can be (A) and (H)

Diatom. Made of glass. "Biominingeralization." Autotrophic. Produces oxygen. Part of the food chain.



Red (A) Red Algae

Ciliate, Has cilia to help it move. Mostly Heterotrophic.



Mostly (H)



Flagellate. Has Flagella

Slime Molds, Decomposes Food.



■ New Area of Focus: Animalia

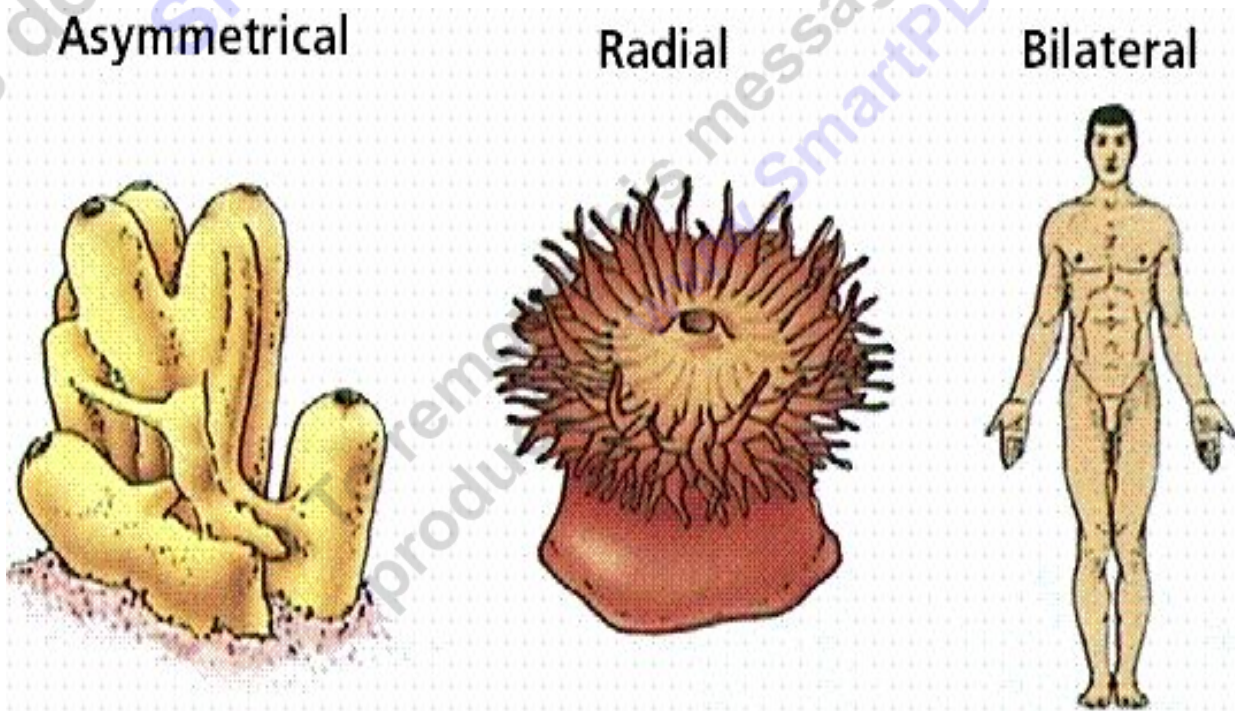
■ Characteristics of Animalia.

- -No cell walls.
- -Animals have a period of embryonic development.
- -Animals eat food.

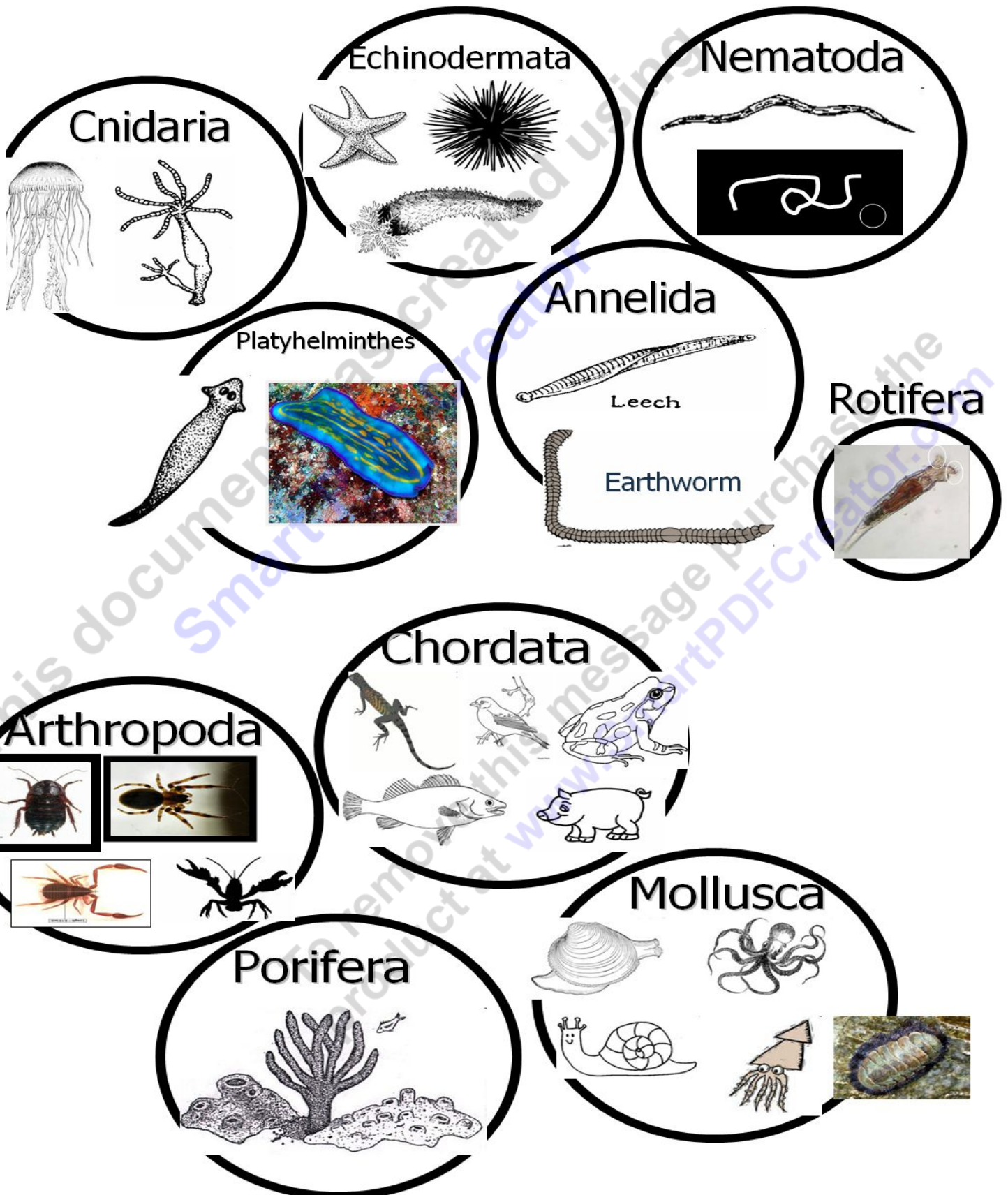
- -Animals move.
- -Animals have nervous and muscle tissue.
- -Animals have diplontic life cycle. Genetic information can come from a mother and father. (Many species)

- Animals have three types of symmetry.

- -Bilateral symmetry.
 - Same on both sides.
- -Radial Symmetry.
 - Arranged equally in all directions from a central point.
- -Asymmetrical.
 - Having no symmetry.
-



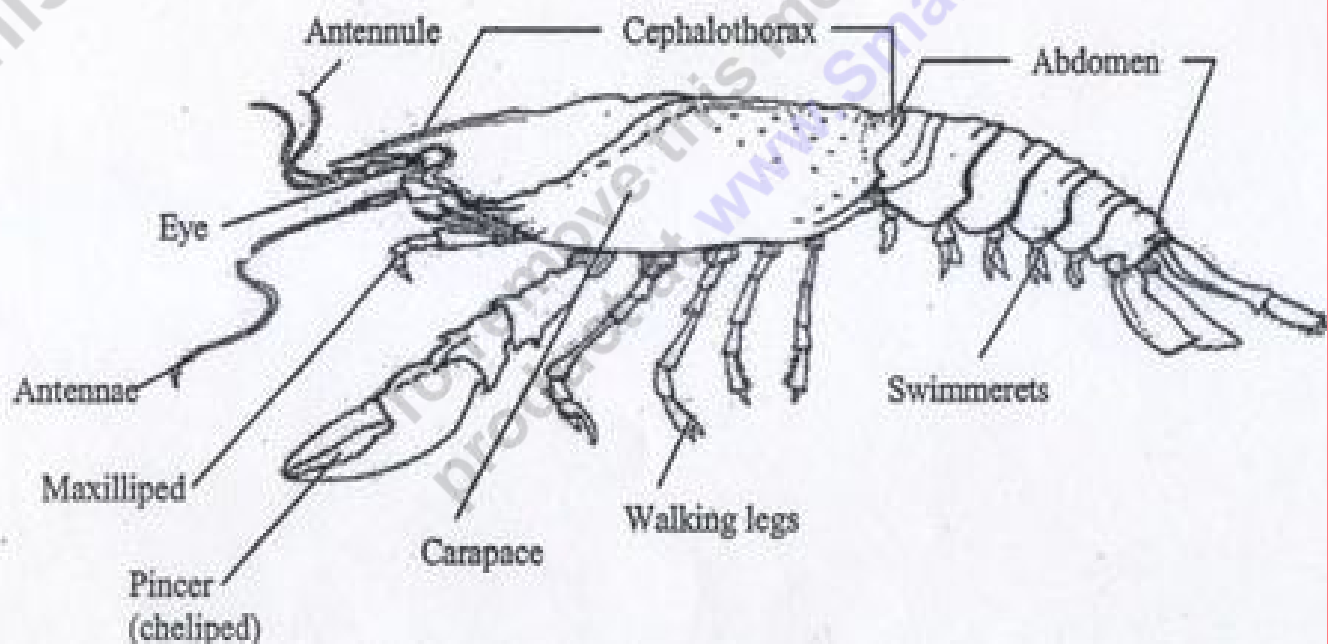
■ New Area of Focus: Learning the Phylums and Animalia.



- Common Phylums of the Kingdom Animalia.
 - -Phylum Mollusca
 - Soft bodies and some have shells.
 - -Phylum Echinodermata - Spiny skinned organisms.
 - Radial symmetry
 - -Phylum Cnidaria – Stinging cells.
 - Silent C ([ni dérrée ən](#)).
 - Radial symmetry.
 - Phylum Porifera – Sponges
 - Asymmetrical.
 - Phylum Rotifera
 - Wheeled organisms
 - (Draw in journal somewhere on page).
 - -Phylum Nematoda
 - The Roundworms.
 - -Phylum Platyhelminthes.
 - The Flatworms.
 - -Phylum Annelida
 - The segmented worms.
 - -Phylum Arthropoda
 - Segmented joints, exoskeleton, bilateral symmetry.
 - The Classes of the Phylum Arthropoda.
 - Insecta
 - Crustacea
 - Arachnida

- Chilopoda
- Diplopoda
- -Class Insecta
 - 6 legs.
 - 3 body parts.
 - Head, thorax, abdomen.
 - Compound eyes.
 - 2 antennae.
 - Only flying arthropod.
- -Class Crustacea
 - Head and abdomen
 - Some have many legs (8+) with many jobs.
 - Most are aquatic

Anatomy of a Crayfish



- Class Arachnida
 - 8 legs.
 - No antennae or wings.
 - Two body parts.
 - Head and sensory.
 - Abdomen.
 - Most live on land.
- Class Chilopoda
 - Head and trunk
 - Many legs per segment
 - No wings
 - Antennae
- Class Diplopoda
 - Millipedes. They are scavengers.
- Phylum Chordata
 - Having a backbone or notocord.
- -Classes of Chordata (The Big 5)
 - Mammalia - Hair
 - Reptilia - Scales
 - Amphibia – Double life, land and water, toads, frogs, salamanders
 - Aves - Birds
 - Fish – See below

Superclass Agnatha (jawless)

- Class Myxini - hagfish
- Class Cephalaspidomorphi - lampreys

Superclass Gnathostomata with jaws

- Class Chondrichthyes (cartilaginous fish - sharks and rays)
- Class Osteichthyes (bony fish), which has two subclasses:
 - Actinopterygii (ray-finned fish)
 - Ray-finned with spikes and spines.
 - Makes up half of all vertebrae species
 - Sarcopterygii (lobe-finned fish)

■ New Area of Focus: Learning about the Order Mammalia.

● 3 subclasses of mammals

- -Eutheria: Placental Mammals.
- -Metatheria (Marsupials).
- -Prototheria / Monotremes (Egg laying mammals).

● Characteristics of Mammals

- -Have hair.
- -Warm-bloodedness.
- -Mammary Glands: Nourish young with milk.
- -Circulatory system: 4 chambered heart.
- -Respiratory system: Lungs are very large.
- -Reproductive system: Young live inside in an embryo.

- -Fat and energy storage.
- -Brain: Largest in the animal world.
- -Digestive system: Salivary glands are present.
- -Small Bones in ear
- -Sweat Glands (Most Mammals).
- -Teeth: Heterodonty - specialized for feeding/diet.
- -Musculature system: Highly plastic for high speed locomotion.
- -Hinged lower jaw.

■ New Area of Focus: Kingdom Fungi.

■ Kingdom Fungi: Multi-cellular (many celled) organisms that ingests food by absorption and reproduces using spores.

- Fungi also have cell walls consisting largely of chitin instead of cellulose.

● Positives and Negatives of Fungi

Positives	Negatives
<ul style="list-style-type: none"> -They help plants - symbiosis -They recycle nutrients -A food source -Pollution remediation -Penicillin can fight bacteria 	<ul style="list-style-type: none"> -Cause disease –Parasitic -Damage food and property -Drug use? - Magic mushrooms, -Can make you sick if the wrong kind is eaten.

- Divisions of Fungi

- -Chytridiomycota / Primitive Fungi

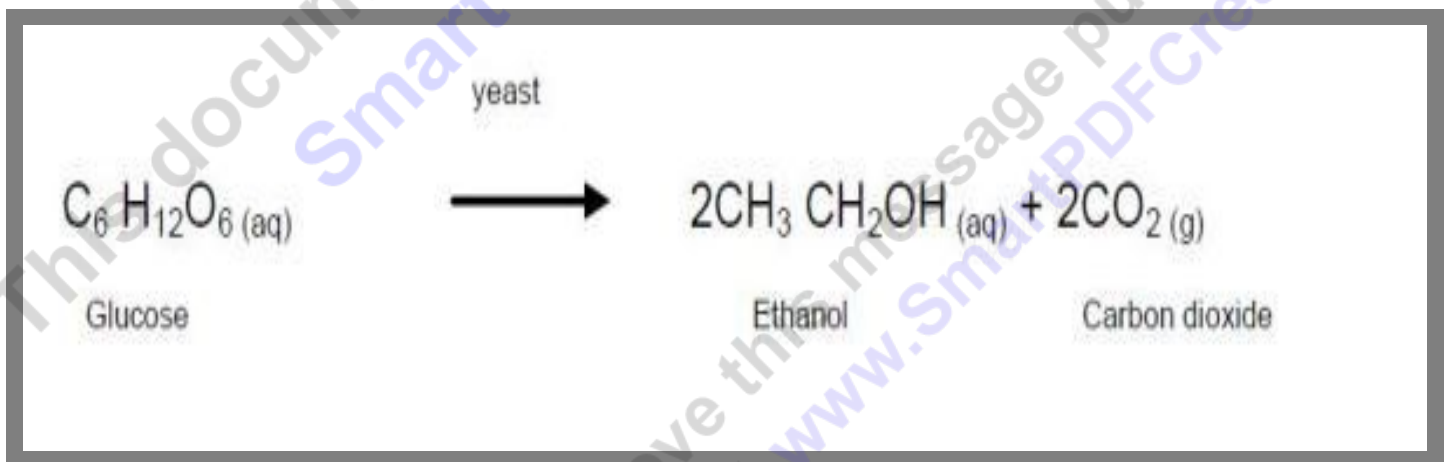
- Live on land and water.
 - Great decomposers.

- -Zygomycota / Molds

- Mycorrhizal fungi in soil.

- -Ascomycota / Sac Fungi:

- 75% of all Fungi.
 - Yeast.
 - Fermentation -The anaerobic (no oxygen) conversion of sugar into carbon dioxide and alcohol by yeast.



- Jock Itch

- Truffles.

- -Mycophycophyta / Lichens:

- Fungi and algae live together (symbiotic)

Lichen: Algae (Protist) 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.

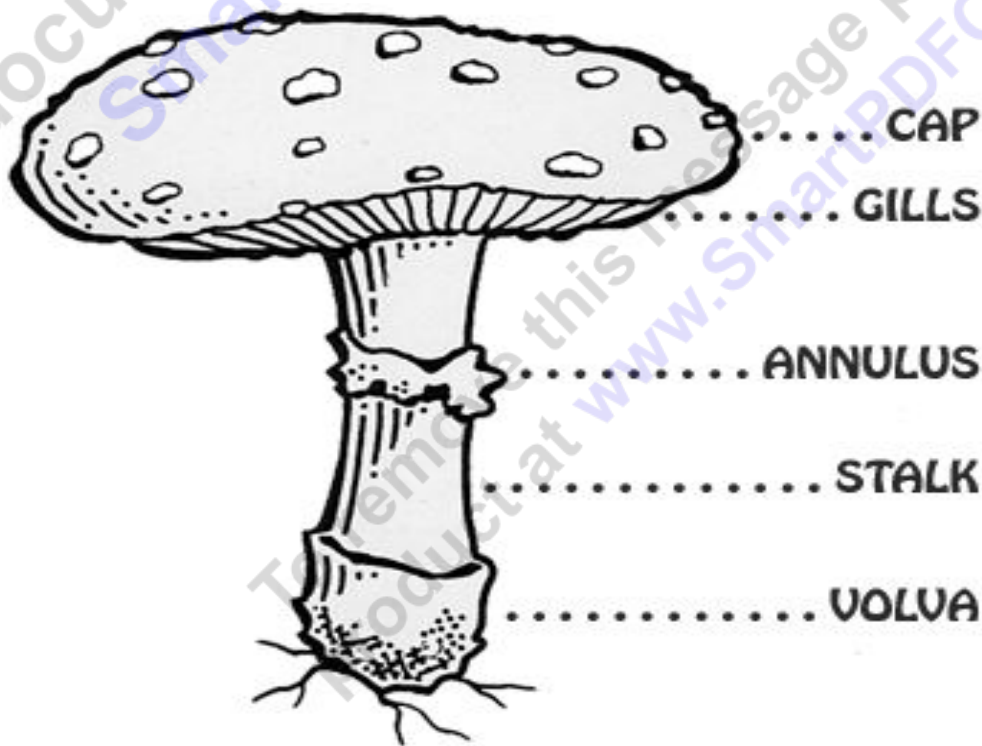
- -Deuteromycota / Imperfect Fungi:

- The leftovers ☹.
- Includes Athletes foot.

- -Basidiomycota / Club Fungi:

- Mushrooms.
- Decomposition of wood.

-



- The 3 Roles of Fungi

- -Mutualistic symbionts – Fungus helps organisms (plants) grow.
 - -Hyphae / Part of the Mycelium- The part of the fungus that feeds, grows, and ultimately may produce a mushroom.
- -Saprobic- decomposes dead things...logs, feces, corpses, and recycles nutrients.
- -Parasitic- Fungi absorbs nutrients (SPONCH) from living cells.
- A few final thoughts on Fungi.
 - Mold prevention.
 - Fermentation.
- Asexually, Fungi reproduce by
 - -Budding / Splitting in two.
 - -Fragmentation / Break off and grow.
 - -Sporulation / releases spores which are tiny reproductive bodies.

Some fungi reproduce sexually, where two haploid spores form a diploid.

- - Spores are microscopic and travel through the air. Storage containers help but spores will always enter.
- To prevent mold growth ...
 - Limit moisture

- Limit warm temperatures (refrigerate food)
- Limit spores (use bags and containers)
- Limit available food sources (remove moldy food from the group.)



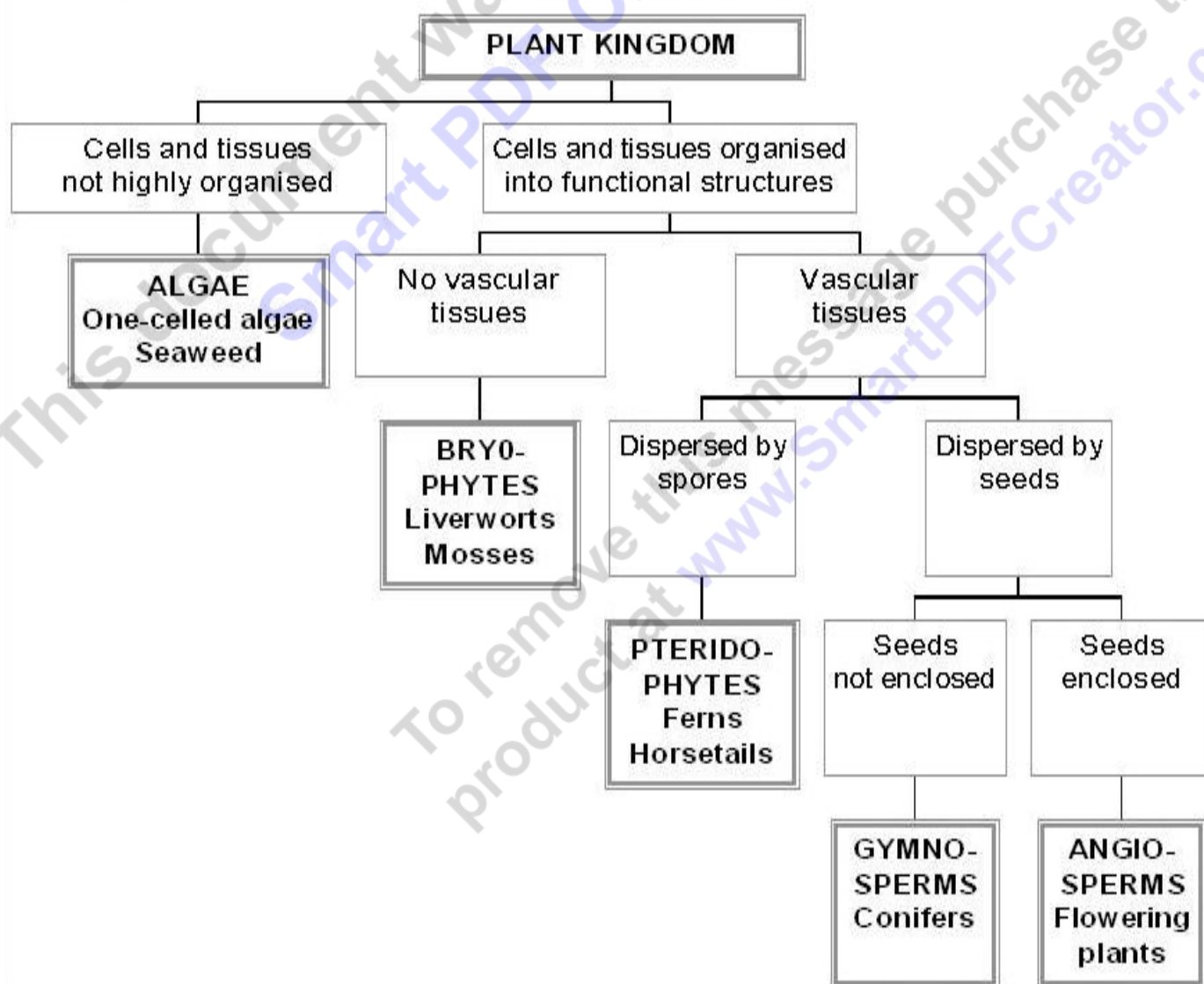
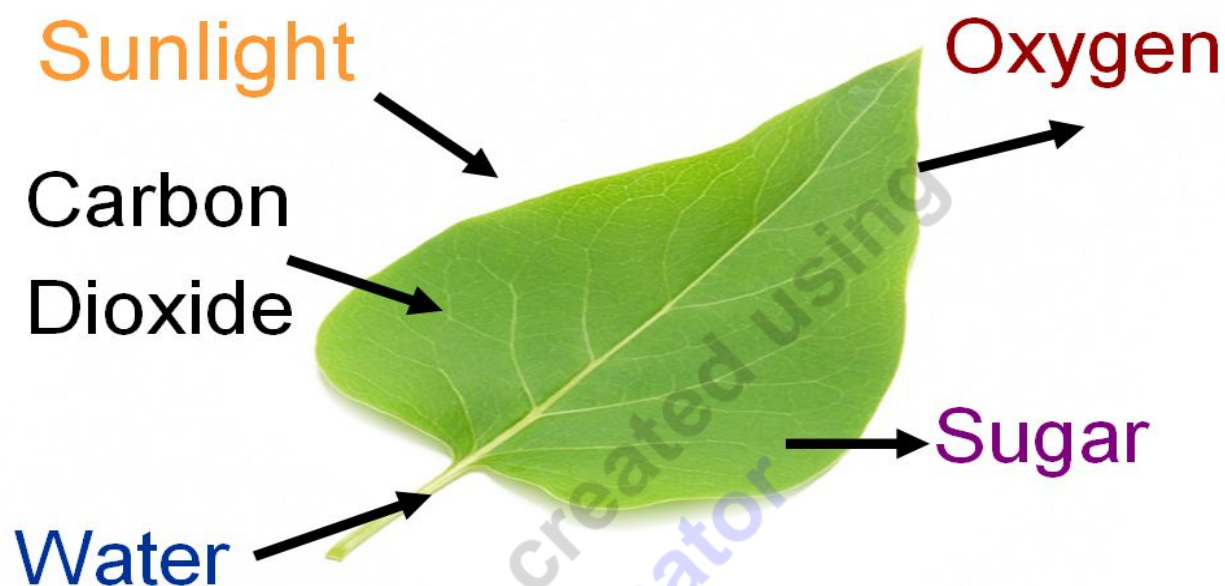
- New Area of Focus: Kingdom Plantae.
- Plants: Have cell walls and make their own food (photosynthesis), and lack the power of locomotion.

Photosynthesis – Plants make sugar from sunlight. Light energy is turned into chemical energy (sugars – carbon based).



Photosynthesis

- Produces sugars from energy.
- Occurs only in cells with chloroplasts.
- Oxygen is produced.
- Water is used.
- Carbon dioxide is used.
- Occurs in light.



Division 1: Bryophyta (Liverworts & Mosses)

Division 2: Psilophyta (Psilotum)

Division 3: Lycophyta (Club Mosses)

Division 4: Sphenophyta (Horsetails)

Division 5: Pterophyta (Ferns)

Division 6: Cycadophyta (Cycads)

Division 7: Ginkgophyta (Ginkgo)

Division 8: Gnetophyta (Gnetum & Welwitschia)

Division 9: Coniferophyta (Cone bearing trees & shrubs)

Division 10: Anthophyta (Flowering Plants)

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

- ☐ They are photosynthetic. They are Protists not in the Kingdom Plantae.

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.

Seed Plants

Gymnosperm: Seed-bearing vascular plants, such as cycads, ginkgo, and conifers.

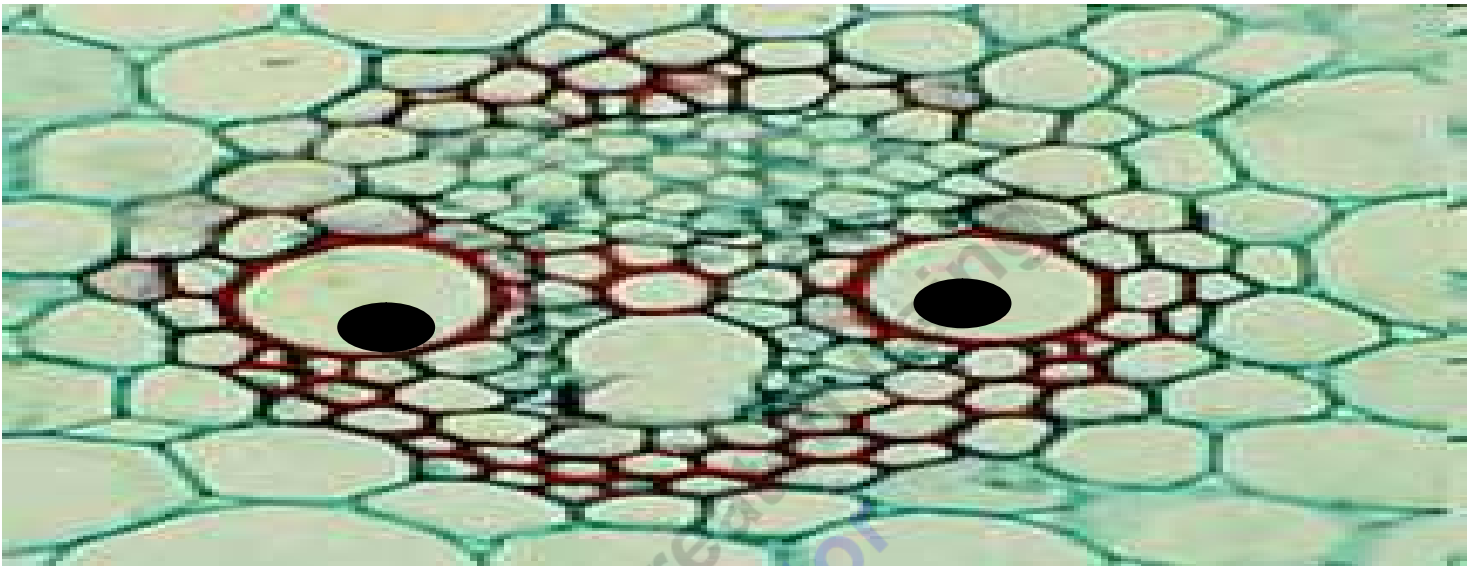
- The ovules or seeds are not enclosed in an ovary.

Angiosperm: Flowering, covered seed, produce seeds enclosed in a fruit /ovary.

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.

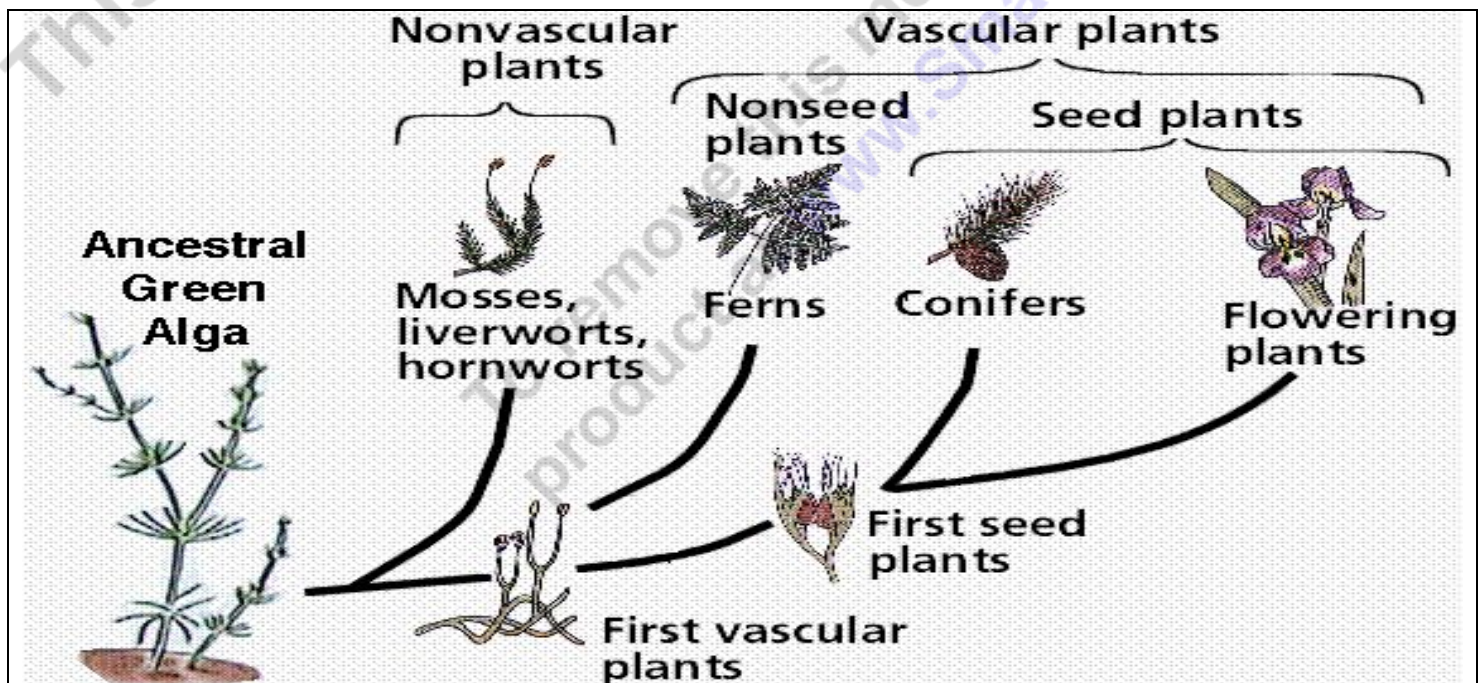


Monocot Man

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: Evolution of Plants.



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.

Vegetable: Edible part of a plant that is not a sweet fruit or seed.
Stalk, leaves, root, etc.

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

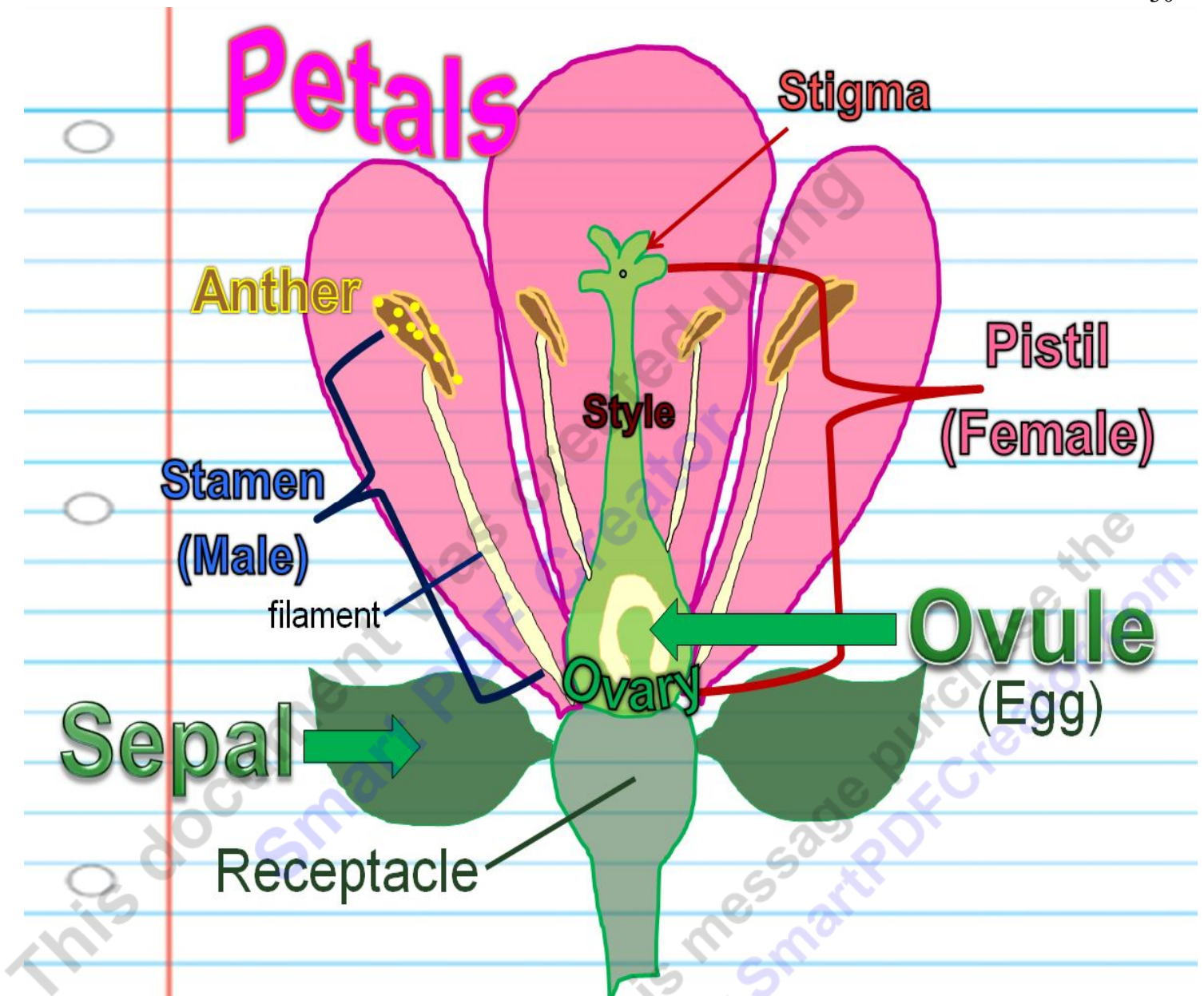
Area of Focus: Parts of a Flower.

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

Types of fruit

Fleshy Fruits

- Berry: A fleshy fruit that contains one to many seeds. (No stony layer)
 - Tomato, Grape
- Drupe is a type of fleshy fruit that has a stony inner layer surrounding a single seed.
 - Plum, Peach
- Pome: This fruit has a core as the true fleshy fruit, and it's surrounded by a fleshy good accessory layer.
 - Apple, Pear
- Fleshy Aggregate Fruits: Develop from flowers with many pistils.
 - Strawberry, Blackberry
- Fleshy Multiple Fruits: Form from a cluster of several flowers.
 - Pineapple, Fig

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

- Legume (Dry Fruit): An elongated pod splitting along two seams. (Beans)

Indehiscent Dry Fruits: Pericarp does not split open. These fruits usually contain only one seed (Nuts)