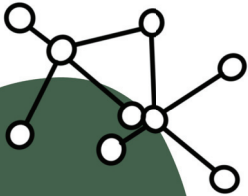




# BIOLOGY

Visual Resources

By Navya Dewan

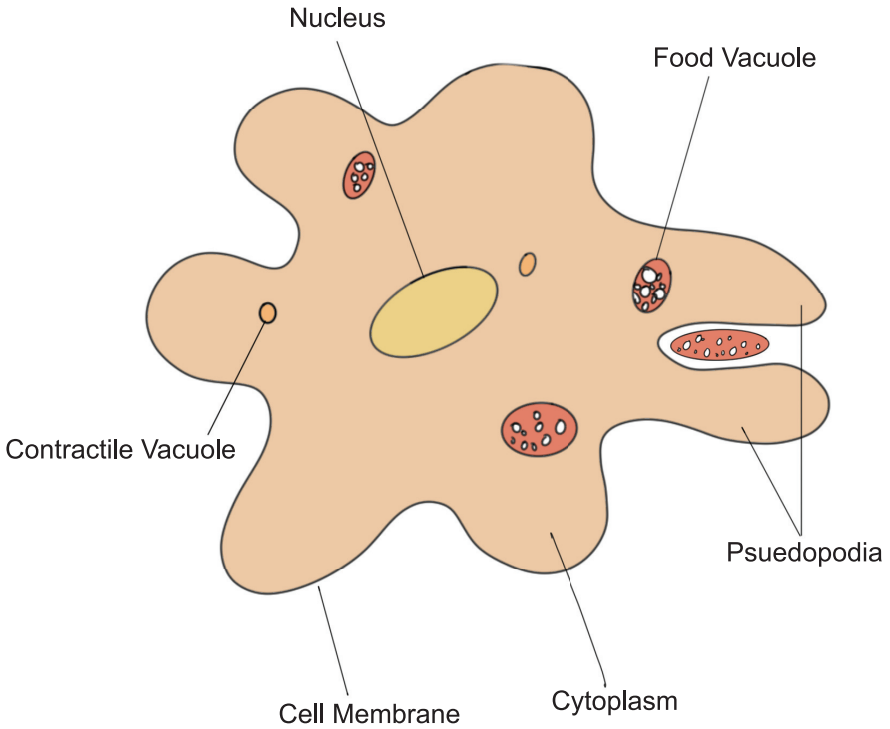


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# Ameoba



# Ameoba

**Pseudopodia:** Temporary extensions of the cell membrane used for movement and feeding.

**Nucleus:** The control center of the amoeba, containing its genetic material.

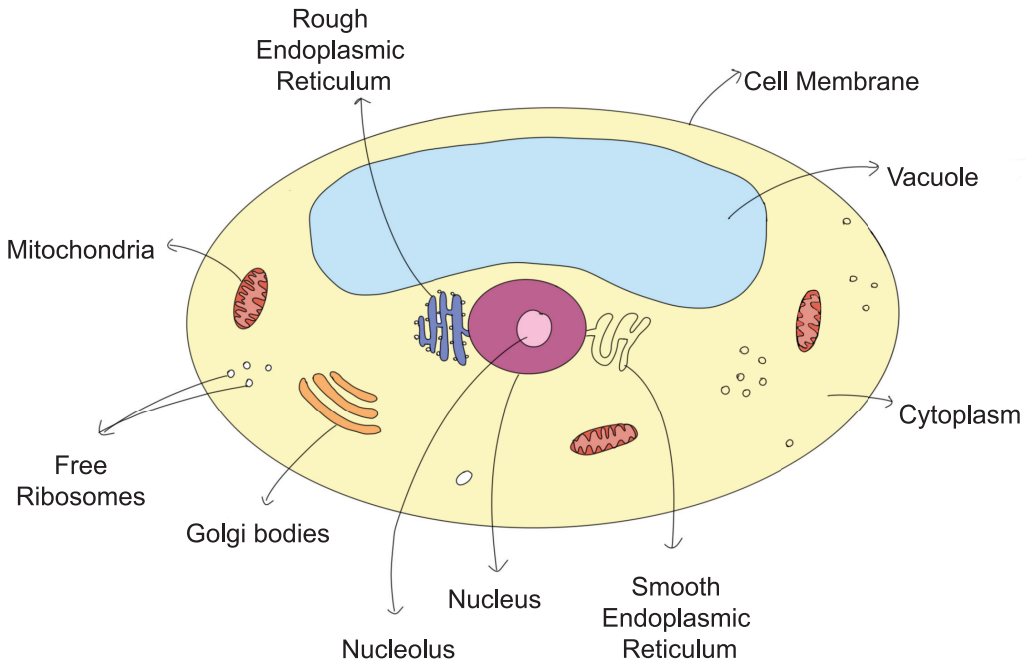
**Cytoplasm:** The fluid where organelles are suspended and cellular processes occur.

**Contractile Vacuole:** Regulates water balance by expelling excess water from the cell.

**Food Vacuole:** A membrane-bound sac that digests engulfed food particles.

**Cell Membrane:** A flexible barrier that surrounds the cell and controls what enters and exits.

# Animal Cell



# Animal Cell

**Nucleus:** The control center of the cell, housing DNA and directing cellular activities.

**Cytoplasm:** A jelly-like substance where organelles are suspended and cellular processes occur.

**Cell Membrane:** A protective barrier that regulates what enters and exits the cell.

**Mitochondria:** The powerhouse of the cell, generating energy through cellular respiration.

**Ribosomes:** Protein synthesis sites, either floating in the cytoplasm or attached to the ER.

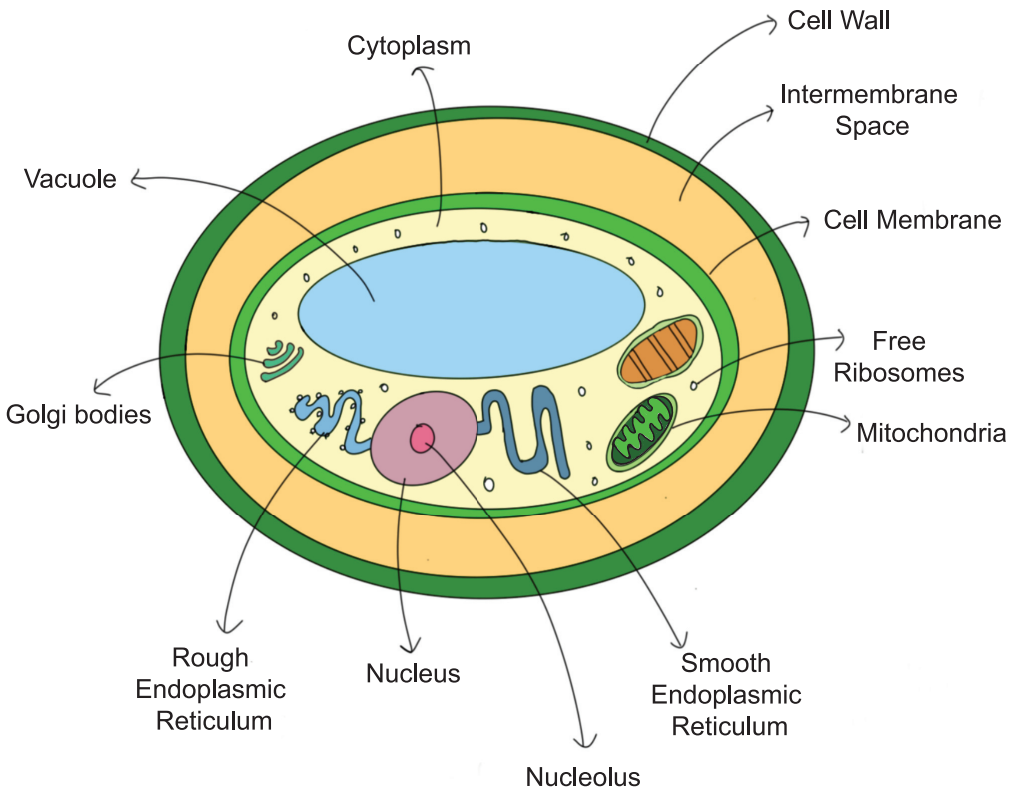
**Endoplasmic Reticulum (ER):** A network of membranes involved in protein and lipid synthesis; rough ER has ribosomes, smooth ER does not.

**Golgi Apparatus:** Modifies, sorts, and packages proteins and lipids for transport or secretion.

**Lysosomes:** Contain digestive enzymes to break down waste and recycle cellular components.

**Nucleolus:** A structure within the nucleus responsible for ribosome production.

# Plant Cell





# Plant Cell

**Cell Wall:** A rigid outer layer that provides structure and protection to the cell.

**Chloroplasts:** Organelles where photosynthesis occurs, converting sunlight into energy.

**Vacuole:** A large storage sac that maintains cell turgor and stores nutrients and waste.

**Nucleus:** The control center containing DNA, directing all cellular activities.

**Cytoplasm:** A gel-like substance where organelles are suspended and chemical reactions take place.

**Cell Membrane:** A semi-permeable barrier regulating what enters and exits the cell.

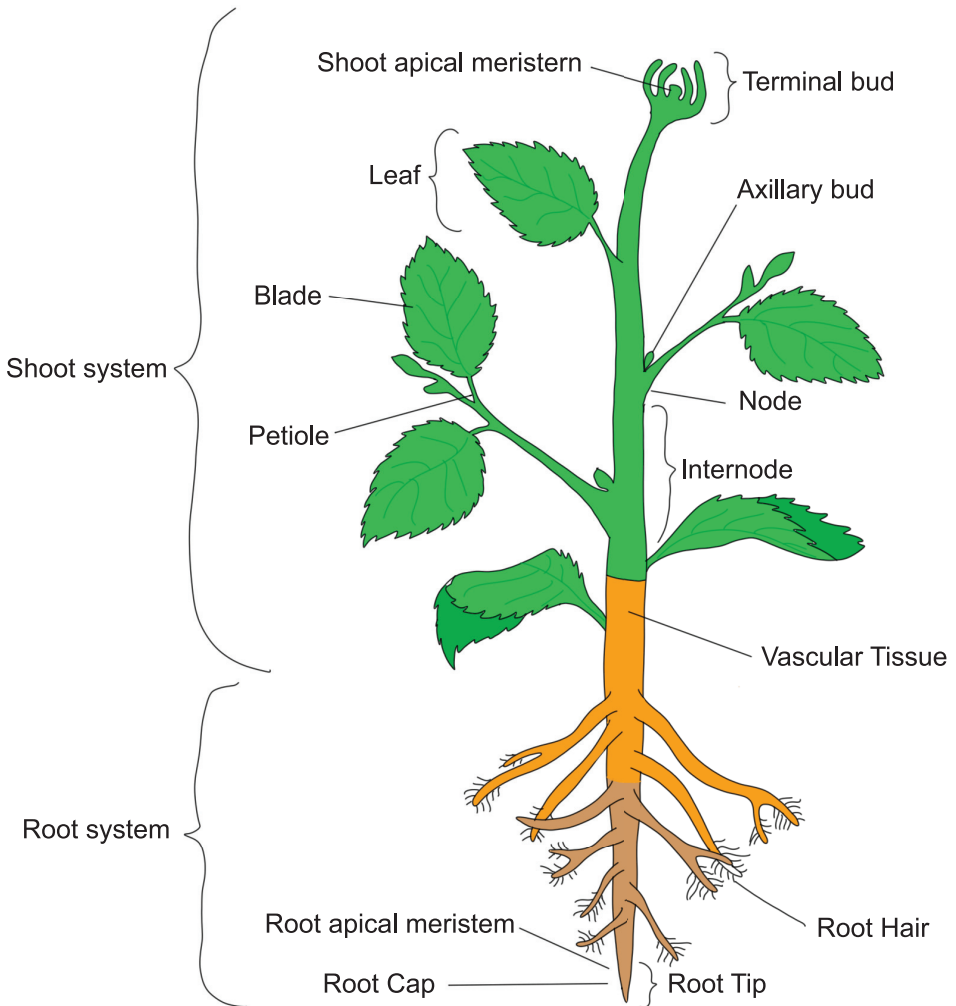
**Mitochondria:** The site of energy production through cellular respiration.

**Ribosomes:** Structures that synthesize proteins, found in the cytoplasm or on the rough ER.

**Endoplasmic Reticulum (ER):** Membrane network involved in the synthesis and transport of proteins (rough ER) and lipids (smooth ER).

**Golgi Apparatus:** Modifies, sorts, and packages proteins and lipids for storage or export.

# Plant



# Plant

**Shoot Apical Meristem:** The region at the tip of the shoot where cells actively divide, to grow new leaves and flowers.

**Terminal Bud:** The primary growing point where the shoot elongates.

**Axillary Bud:** Buds that have the potential to form a branch or flower.

**Node:** The point on the stem where leaves or branches are attached.

**Internode:** Segment of the stem between two nodes, where elongation occurs.

**Vascular Tissue:** The network of tubes responsible for transporting water, nutrients, and food throughout the plant.

**Root Apical Meristem:** The region at the tip of the root where cells divide to enable root growth.

**Root Cap:** Protective structure covering the root tip and helps the root penetrate the soil.

**Root Hair:** Tiny hair-like structures increase the surface area of the root for absorption of water and nutrients.

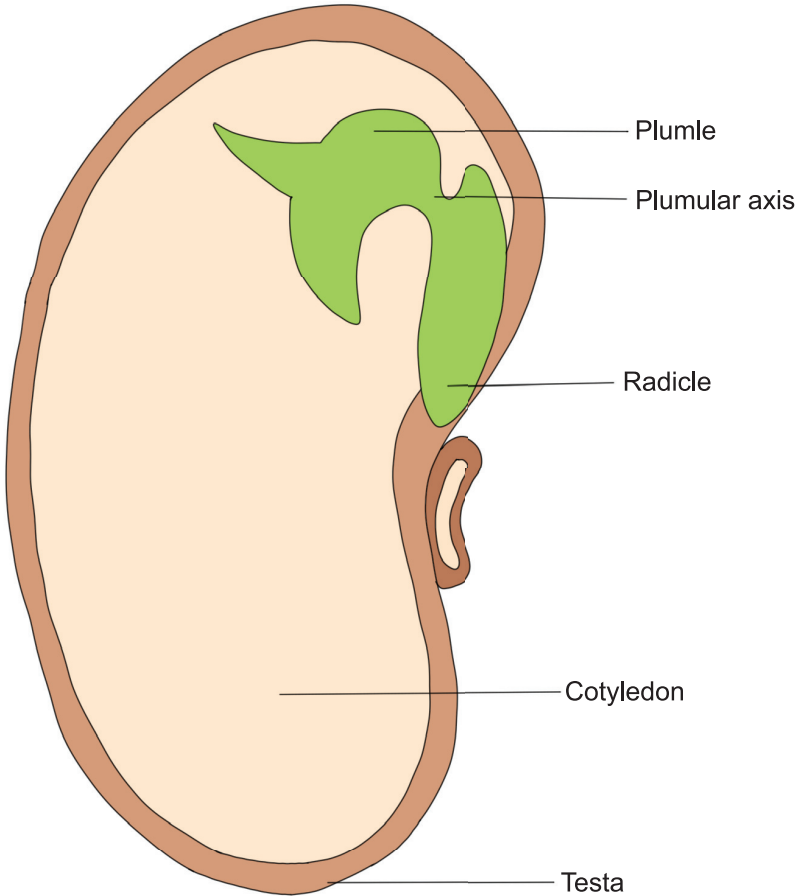
**Root Tip:** The growing end of the root where cells actively divide and elongate.

**Leaf:** The organ of the plant responsible for photosynthesis, typically consisting of a blade and petiole.

**Blade:** The flat, expanded part of the leaf where photosynthesis occurs.

**Petiole:** The stalk that attaches the leaf blade to the stem.

# Seed



# Seed

**Seed Coat:** The outer protective layer that shields the seed from physical damage and disease.

**Embryo:** The young plant that will develop into a mature plant, containing the future roots, stem, and leaves.

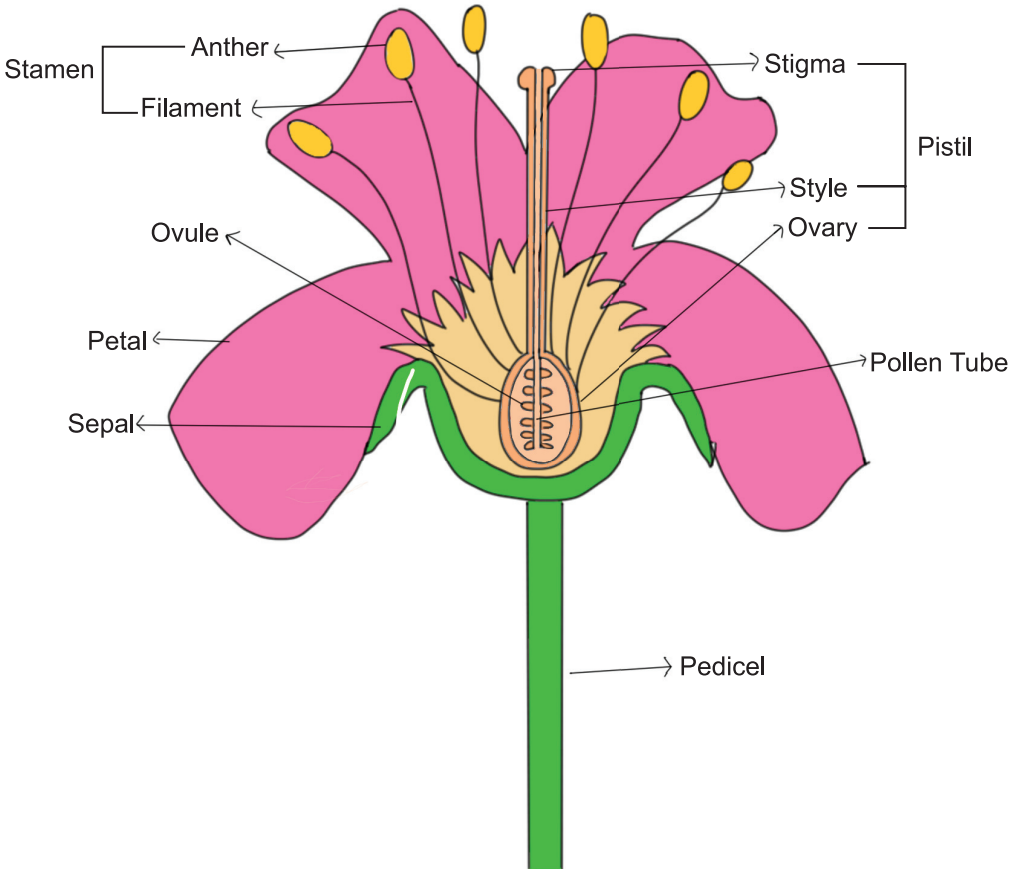
**Cotyledon:** The seed leaf that stores nutrients to nourish the embryo during germination.

**Radicle:** The part of the embryo that develops into the root system.

**Plumule:** The part of the embryo that develops into the shoot system.

**Testa:** Another term for the seed coat, protecting the internal contents of the seed.

# Flower



# Flower

**Petal:** Often colorful, petals attract pollinators like insects and birds to the flower.

**Sepal:** These are the protective outer layers of a flower bud that encase the developing petals.

**Stamen:** The male reproductive organ of the flower, consisting of the anther and filament.

**Anther:** Part of the stamen, the anther produces and releases pollen, which contains the male gametes.

**Filament:** The slender stalk that supports the anther, positioning it for effective pollen transfer.

**Pistil:** The female reproductive organ of the flower, consisting of the stigma, style, and ovary.

**Stigma:** The top part of the pistil, which is sticky to catch and hold pollen grains.

**Style:** The slender stalk that connects the stigma to the ovary, allowing pollen tubes to grow toward the ovary.

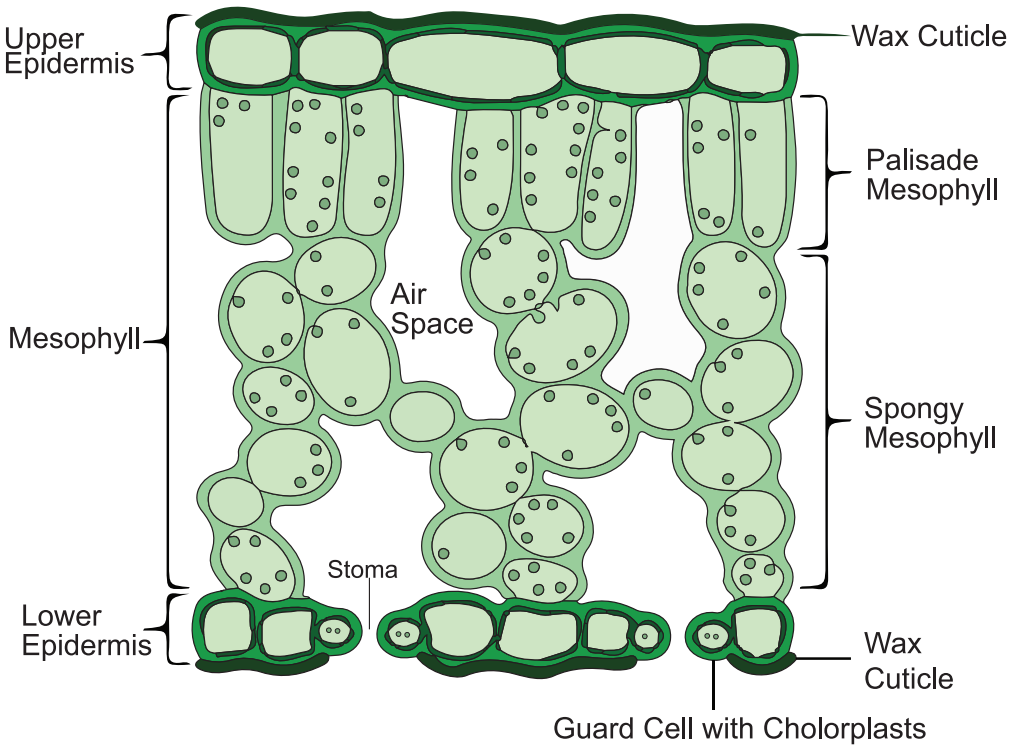
**Ovary:** The base of the pistil that contains ovules, which develop into seeds upon fertilization.

**Ovule:** The structure within the ovary that develops into a seed after fertilization.

**Receptacle:** The thickened part of a stem from which the flower organs grow.

**Pedice:** The stalk that supports the flower, connecting it to the plant.

# Leaf System





# Leaf System

**Cuticle:** A waxy layer on the surface of the leaf that reduces water loss.

**Epidermis:** The outer layer of cells that protect the leaf and allow gas exchange.

**Stomata:** Small openings on the leaf surface that regulate gas exchange and water vapor release.

**Guard Cells:** Specialized cells that open and close the stomata to control gas exchange.

**Mesophyll:** The inner tissue of the leaf, containing chloroplasts for photosynthesis.

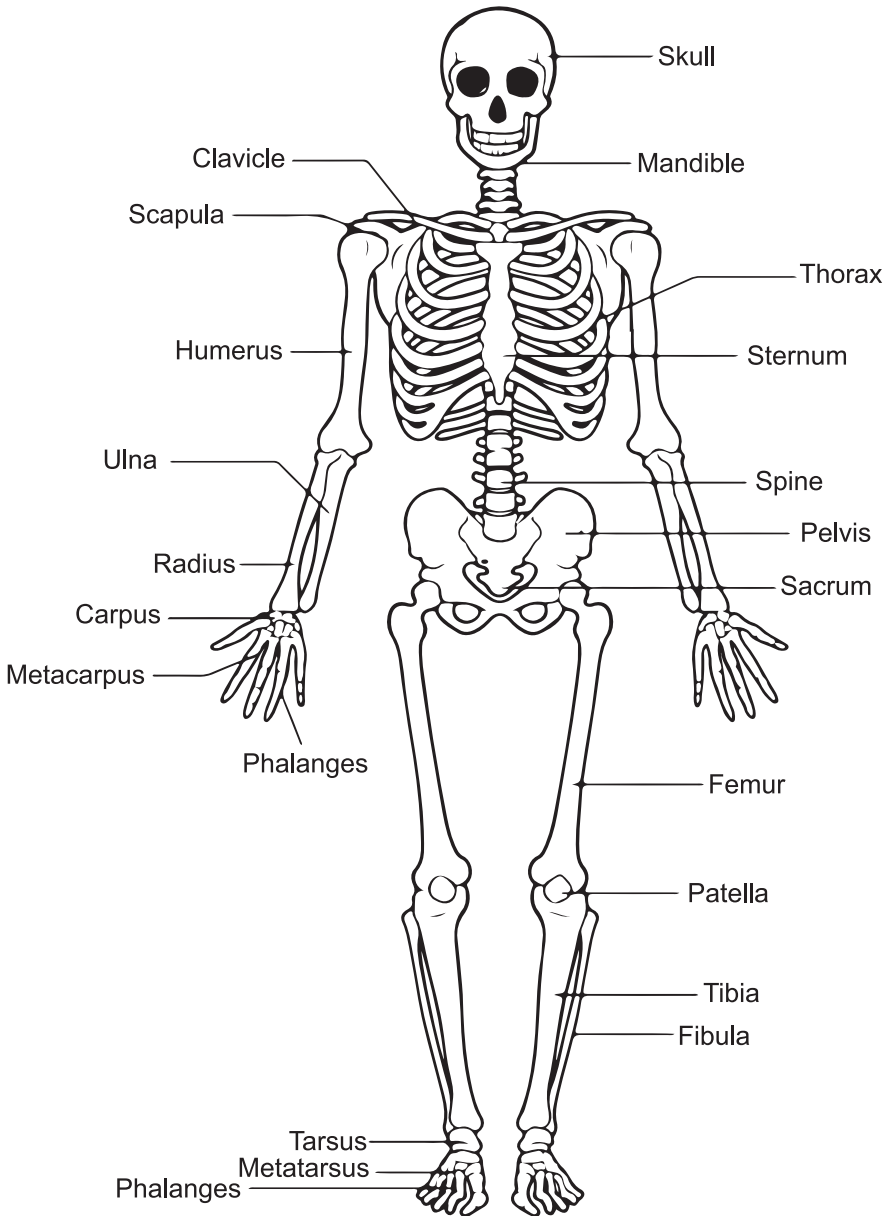
**Chloroplasts:** Organelles in the mesophyll where photosynthesis occurs, converting sunlight into energy.

**Xylem:** Vessels that transport water and minerals from the roots to the leaves.

**Phloem:** Vessels that transport nutrients, particularly sugars, throughout the plant.

**Palisade Mesophyll:** A layer of tightly packed cells rich in chloroplasts, responsible for most of the photosynthesis.

# Skeleton



# Skeleton

**Skull:** Protects the brain and supports the structure of the face.

**Mandible:** The lower jawbone, essential for chewing and speaking.

**Clavicle:** Also known as the collarbone, connects the arm to the body and provides support for shoulder movement.

**Scapula:** The shoulder blade, enabling arm movement and providing attachment for muscles.

**Sternum:** The breastbone, connects the rib bones and protects the heart and lungs.

**Thorax :** Protects the chest organs, including the heart and lungs, and supports breathing.

**Humerus:** The long bone in the upper arm, connecting the shoulder to the elbow.

**Ulna:** The inner and longer bone of the forearm, forming the elbow joint with the humerus.

**Radius:** The outer bone of the forearm, allowing rotation of the hand and forearm.

**Carpus:** The collection of eight small bones forming the wrist.

**Metacarpus:** The five bones of the hand between the wrist and the fingers.

**Phalanges:** The bones of the fingers and toes.

**Spine:** The vertebral column, supporting the body's weight and protecting the spinal cord.

**Pelvis:** The hip bones that support the weight of the upper body and protect pelvic organs.

**Sacrum:** A triangular bone at the base of the spine that connects the spine to the pelvis.

**Femur:** The thigh bone, the longest and strongest bone in the body.

**Patella:** The kneecap, protecting the knee joint and aiding in leg movement.

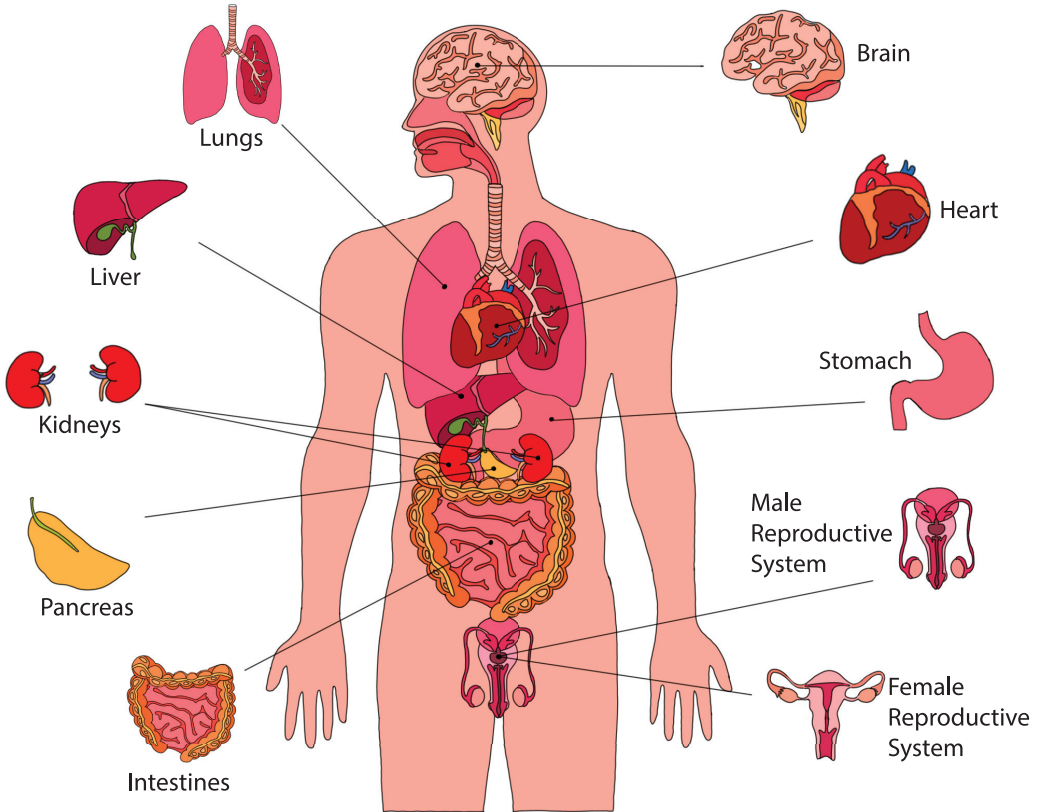
**Tibia:** The larger bone of the lower leg, supporting weight and forming the ankle joint.

**Fibula:** The smaller bone of the lower leg, providing stability to the ankle.

**Tarsus:** A group of seven bones in the foot forming the ankle.

**Metatarsus:** The five long bones in the foot between the ankle and toes.

# Organ System



# Organ System

**Brain:** The control center of the body, responsible for processing sensory information and directing bodily functions.

**Lungs:** Organs responsible for gas exchange, supplying oxygen to the blood and removing carbon dioxide.

**Heart:** The muscular organ that pumps blood throughout the body, supplying oxygen and nutrients to tissues.

**Liver:** A large organ that detoxifies chemicals, metabolizes drugs, and produces important proteins for blood clotting.

**Stomach:** The organ where food is broken down by acids and enzymes for digestion.

**Kidneys:** Organs that filter blood, removing waste and excess fluids to form urine.

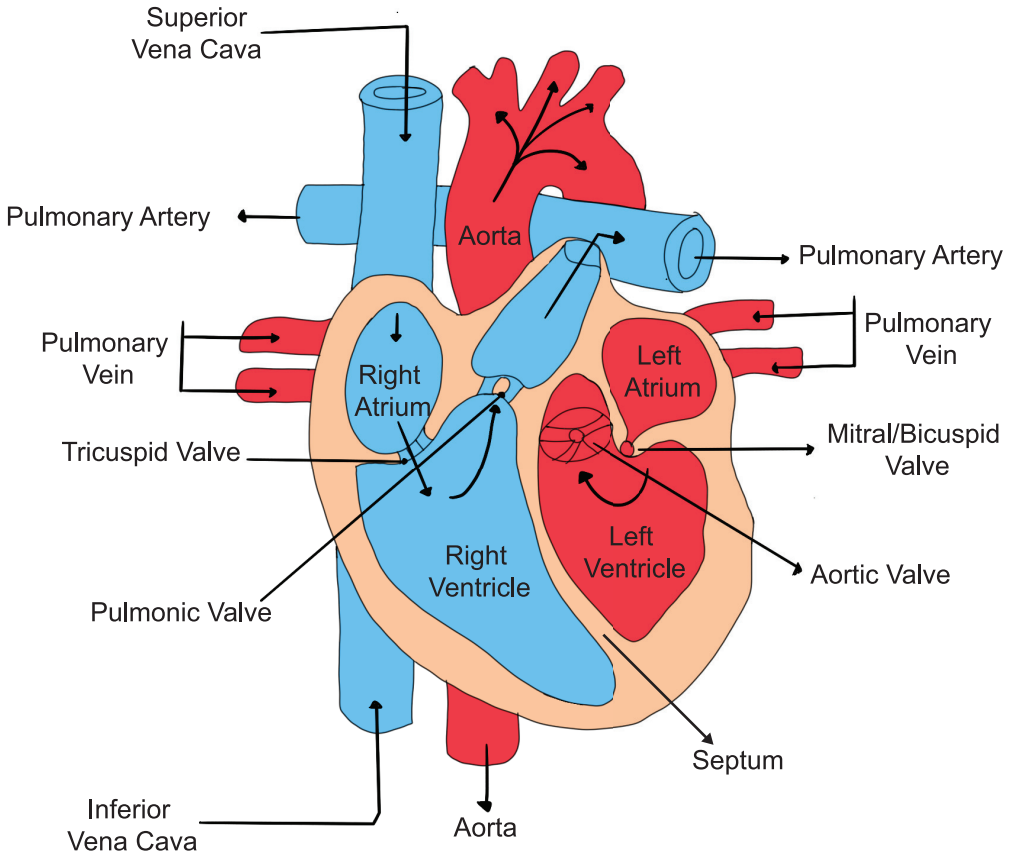
**Pancreas:** An organ that produces digestive enzymes and hormones, including insulin.

**Intestines:** The digestive tract where nutrients are absorbed, and waste is processed.

**Male Reproductive System:** The organs involved in producing and delivering sperm.

**Female Reproductive System:** The organs involved in producing eggs, supporting fertilization, and nurturing the fetus.

# Heart



# Heart

**Atria:** The two upper chambers that receive blood entering the heart.

**Ventricles:** The two lower chambers that pump blood out of the heart to the body and lungs.

**Aorta:** The largest artery that carries oxygen-rich blood from the heart to the rest of the body.

**Pulmonary Arteries:** Carry deoxygenated blood from the heart to the lungs for oxygenation.

**Pulmonary Veins:** Return oxygenated blood from the lungs to the heart.

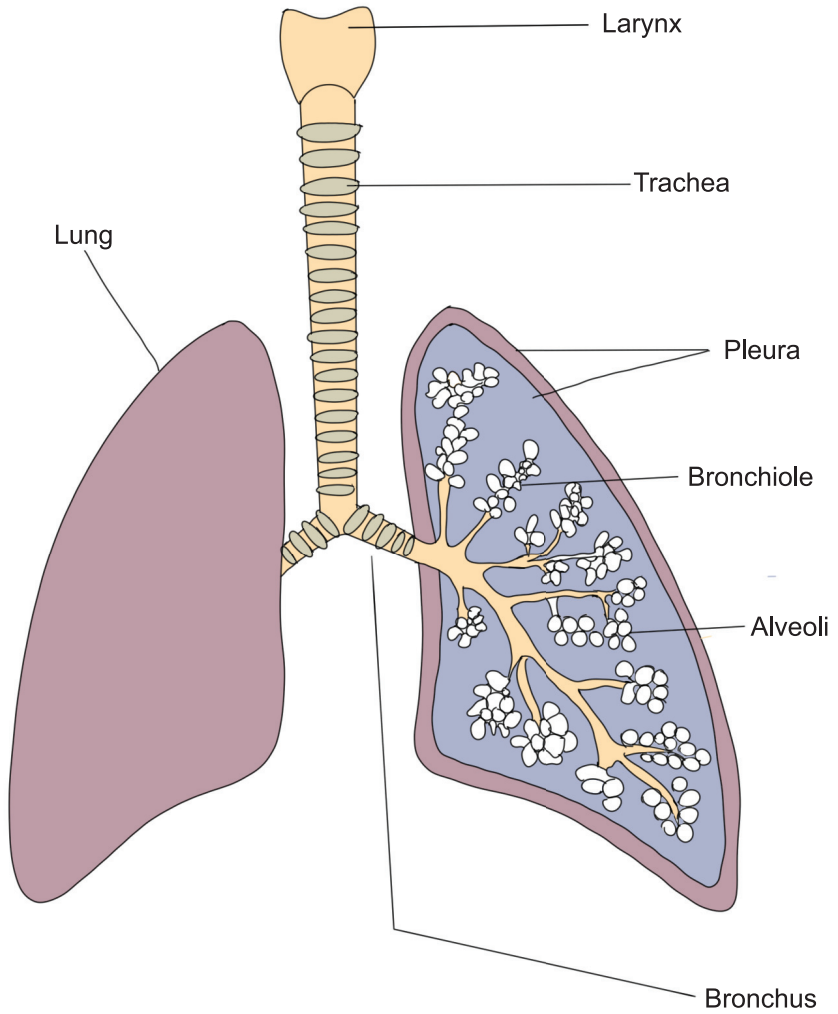
**Superior/Inferior Vena Cava:** Large veins that bring deoxygenated blood from the body to the heart.

**Valves:** Flaps between heart chambers and vessels that prevent backflow of blood.

**Septum:** The wall that separates the right and left sides of the heart.

**Coronary Arteries:** Blood vessels that supply oxygen-rich blood to the heart muscle.

# Lungs





# Lungs

**Alveoli:** Tiny air sacs where gas exchange occurs, oxygen enters blood, and carbon dioxide is expelled.

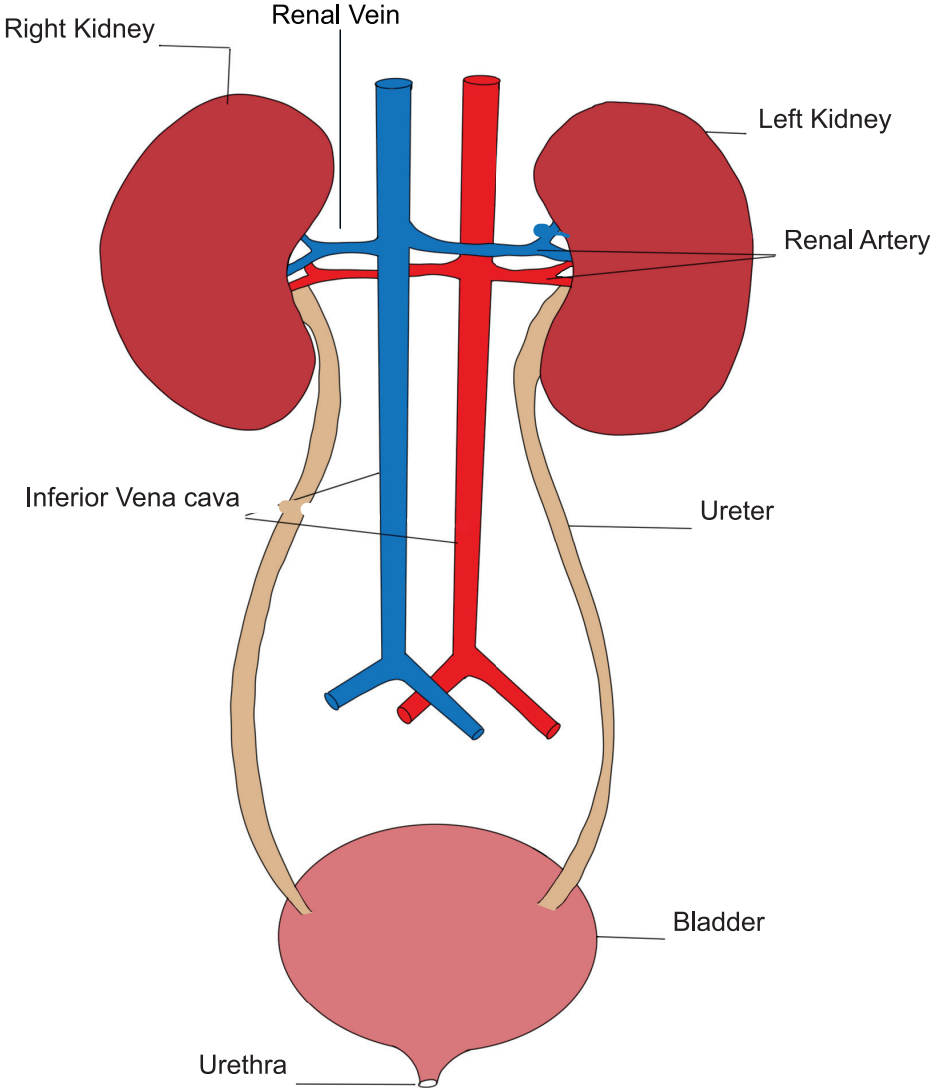
**Bronchi:** The main passageways that direct air into the lungs from the trachea.

**Bronchioles:** Smaller branches of the bronchi that lead to the alveoli.

**Trachea:** The windpipe that connects the larynx to the bronchi, allowing air to enter the lungs.

**Pleura:** A double-layered membrane surrounding the lungs, providing lubrication for movement.

# Kidneys



# Kidneys

**Right Kidney:** Filters waste from the blood and produces urine.

**Left Kidney:** Works alongside the right kidney to remove waste and balance fluids.

**Renal Vein:** Carries filtered blood away from the kidneys to the inferior vena cava.

**Renal Artery:** Supplies the kidneys with oxygenated blood for filtration.

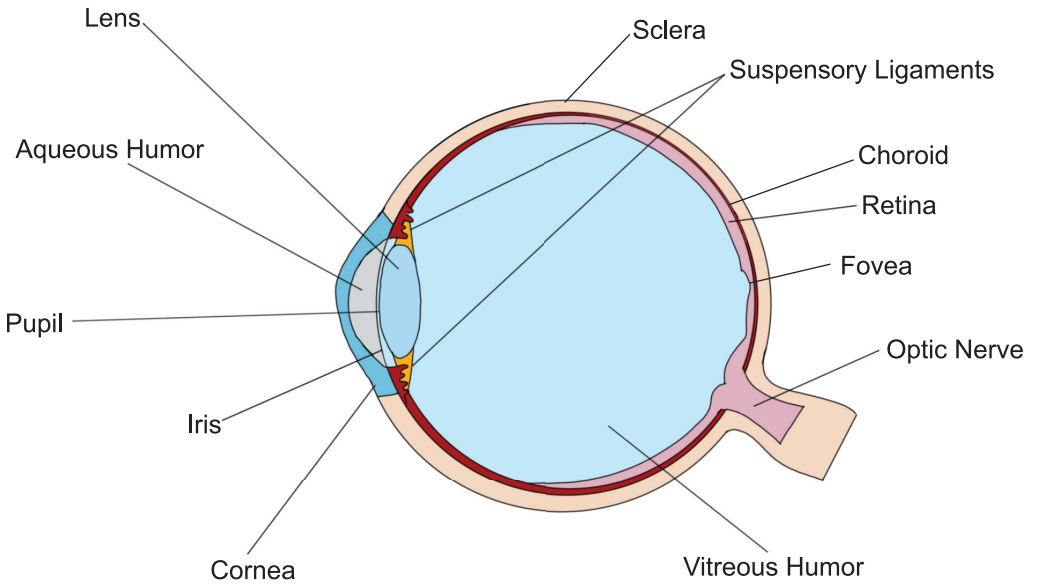
**Inferior Vena Cava:** Returns deoxygenated blood from the lower body to the heart.

**Ureter:** Transports urine from the kidneys to the bladder.

**Bladder:** Stores urine until it is ready to be excreted.

**Urethra:** The tube that carries urine from the bladder out of the body.

# Eye



# Eye

**Cornea:** The transparent outer layer that helps focus light onto the retina.

**Iris:** The colored part of the eye that controls the size of the pupil and regulates the amount of light entering the eye.

**Pupil:** The opening in the center of the iris that allows light to enter the eye.

**Lens:** A transparent structure that focuses light rays onto the retina for clear vision.

**Retina:** The inner layer of the eye containing photoreceptor cells (rods and cones) that detect light and transmit visual information to the brain.

**Optic Nerve:** The nerve that transmits visual information from the retina to the brain.

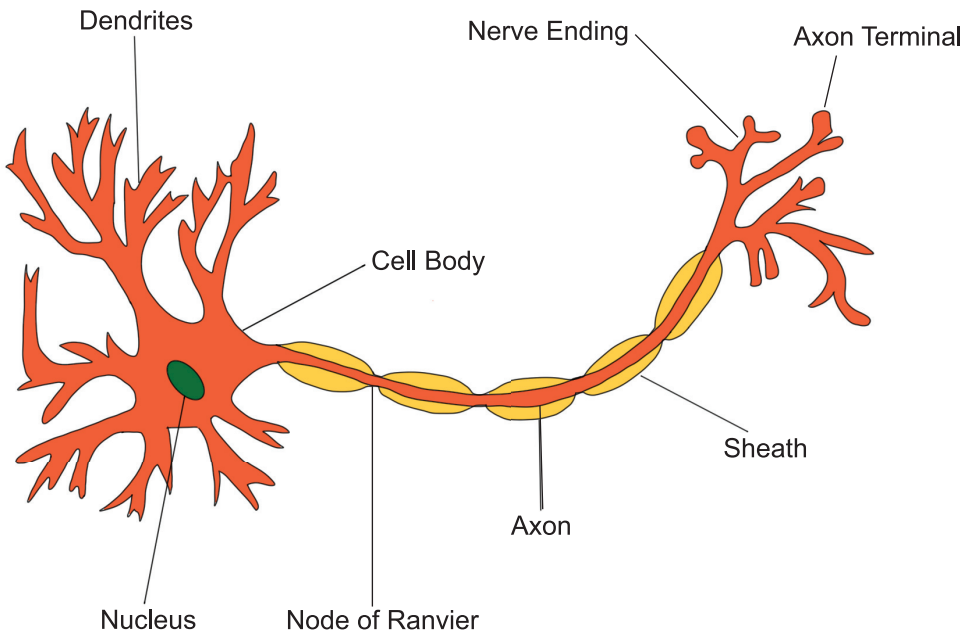
**Sclera:** The white, protective outer layer of the eye that provides structure and support.

**Vitreous Humor:** A gel-like substance that fills the space between the lens and the retina, maintaining the eye's shape.

**Aqueous Humor:** A clear fluid between the cornea and lens that helps maintain pressure and nourish the eye.

**Ciliary Body:** A muscle that controls the shape of the lens for focusing and produces aqueous humor.

# Neuron



# Neuron

**Cell Body (Soma):** Contains the nucleus and organelles, maintaining the neuron's structure and function.

**Dendrites:** Branch-like extensions that receive signals from other neurons and transmit them to the cell body.

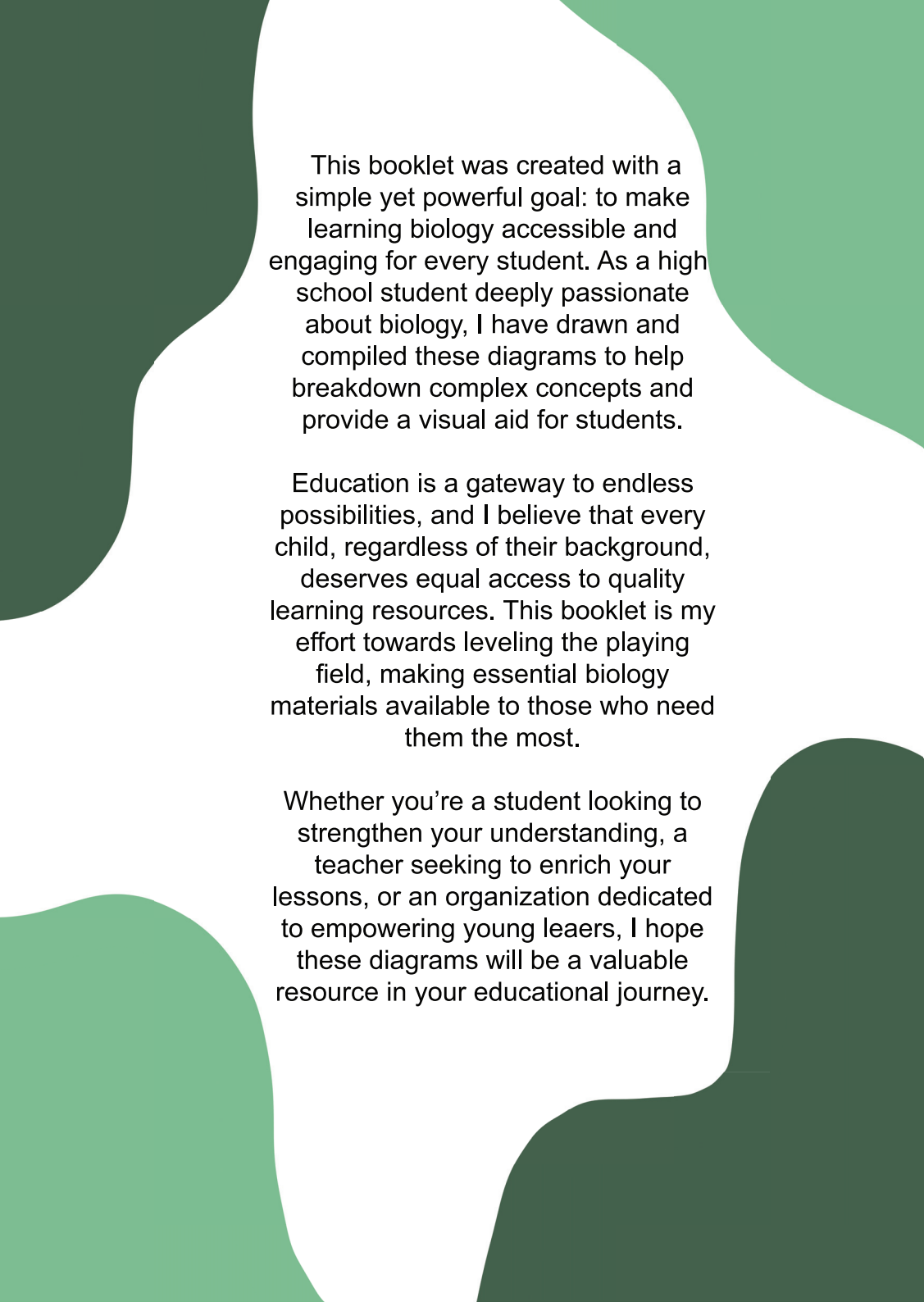
**Axon:** A long, thin projection that conducts electrical impulses away from the cell body toward other neurons or muscles.

**Myelin Sheath:** A fatty layer that insulates the axon and speeds up signal transmission.

**Nodes of Ranvier:** Gaps in the myelin sheath that facilitate rapid signal conduction along the axon.

**Axon Terminals:** The endpoints of an axon where signals are transmitted to other neurons, muscles, or glands.

**Nucleus:** Contains the neuron's genetic material, controlling its activities.

The background features several large, organic, wavy shapes in two shades of green: a dark forest green and a lighter sage green. These shapes are positioned around the edges of the page, framing the central text. The shapes are not perfectly circular or rectangular, but rather fluid and abstract, resembling watercolor splatters or natural forms.

This booklet was created with a simple yet powerful goal: to make learning biology accessible and engaging for every student. As a high school student deeply passionate about biology, I have drawn and compiled these diagrams to help breakdown complex concepts and provide a visual aid for students.

Education is a gateway to endless possibilities, and I believe that every child, regardless of their background, deserves equal access to quality learning resources. This booklet is my effort towards leveling the playing field, making essential biology materials available to those who need them the most.

Whether you're a student looking to strengthen your understanding, a teacher seeking to enrich your lessons, or an organization dedicated to empowering young learners, I hope these diagrams will be a valuable resource in your educational journey.