Human Body Unit Notes

Name:_____

DO NOT LOSE!

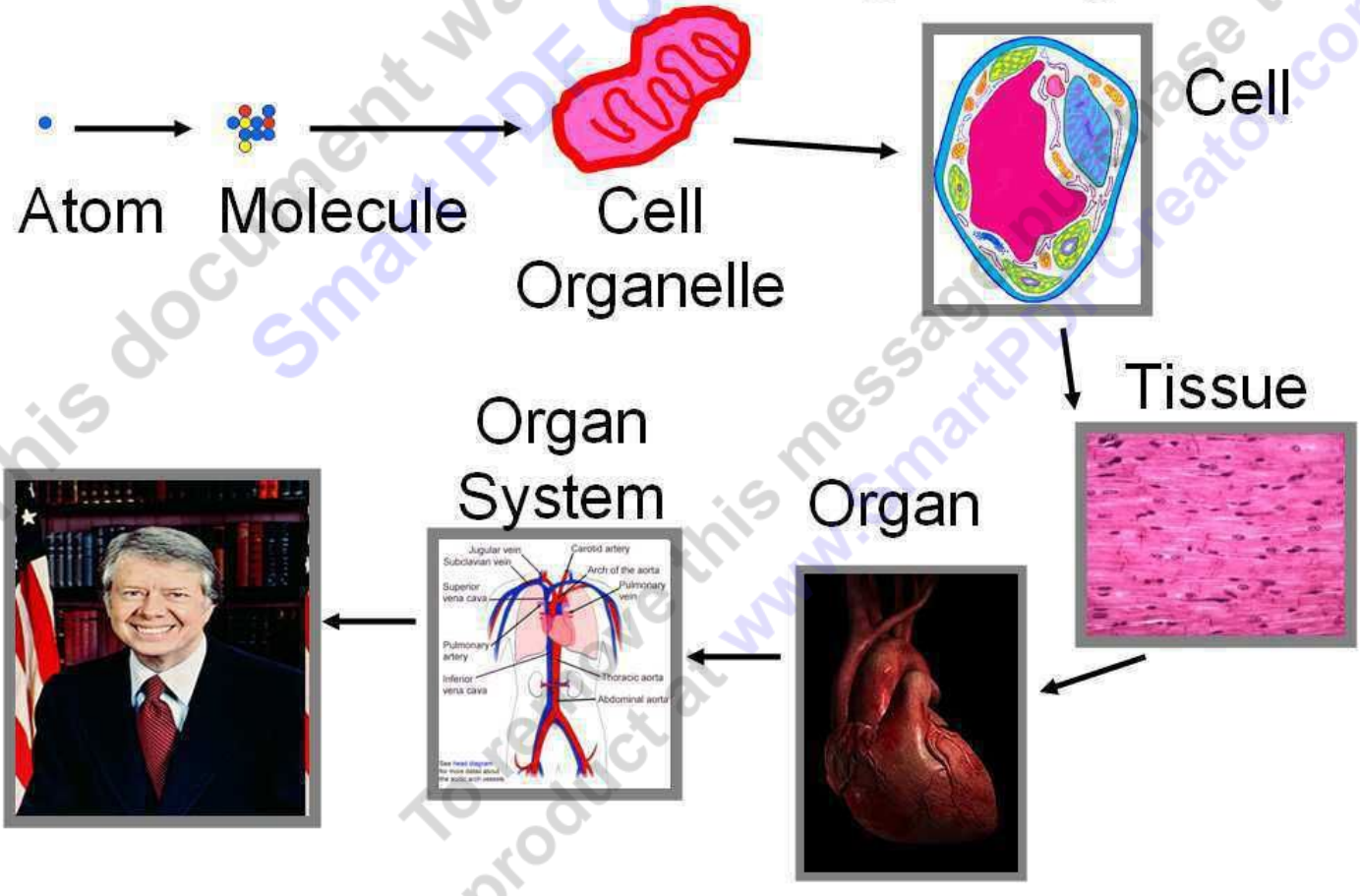
Part I: Levels of Biological Organization

Anatomy: The science of the shape and structure of organisms.

(FFF) Form Follows Function: Parts of the body are shaped to perform a particular job.

Physiology: How it all works.

- Area of Focus: Levels of Biological Organization.



Plant and animal cells both have…

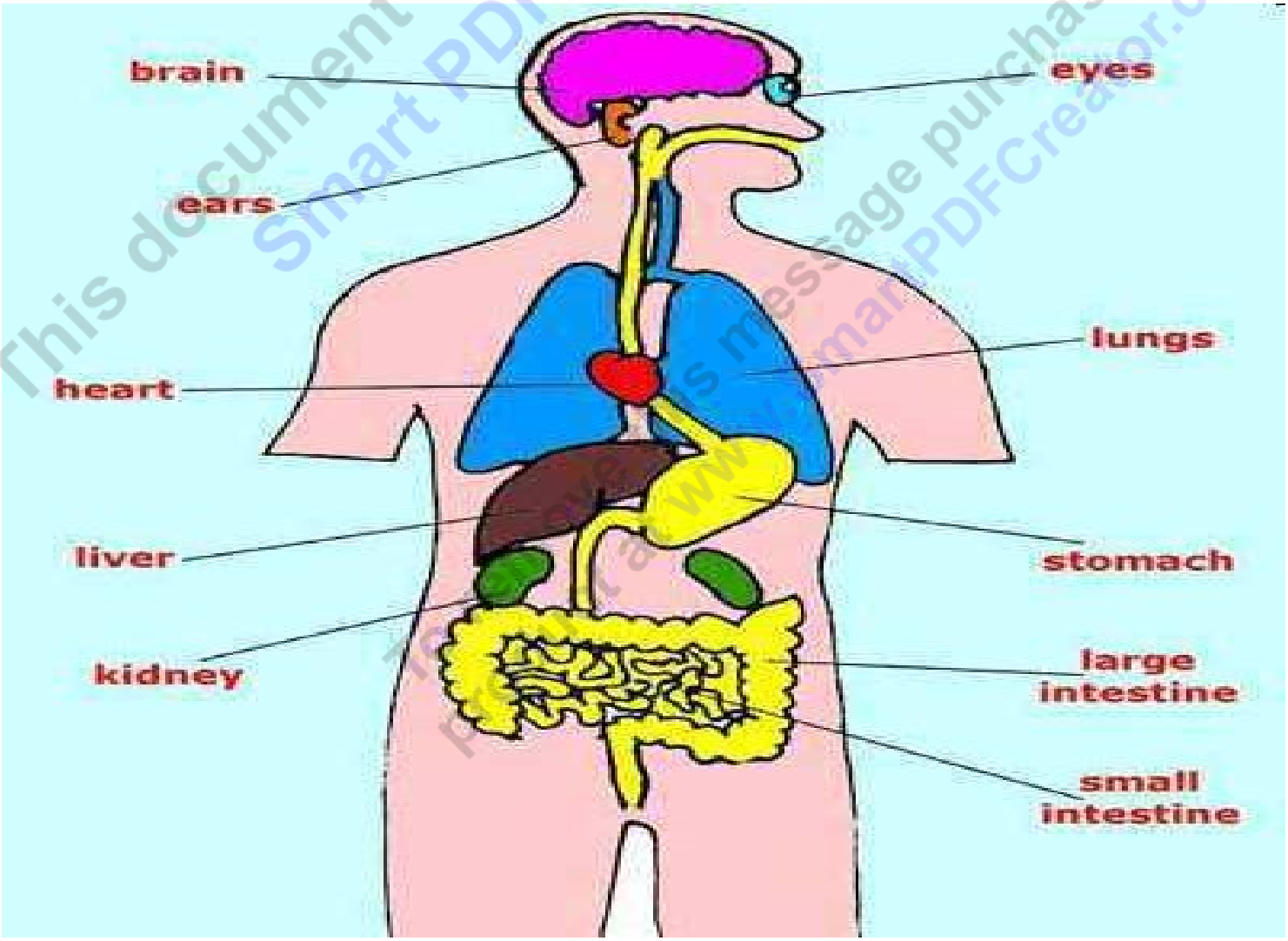
- Nucleus
- Cytoplasm
- Cell Membrane.
- Other similar organelles.
- Many of the same processes.

Cells are the structural and functional units of all living organisms.

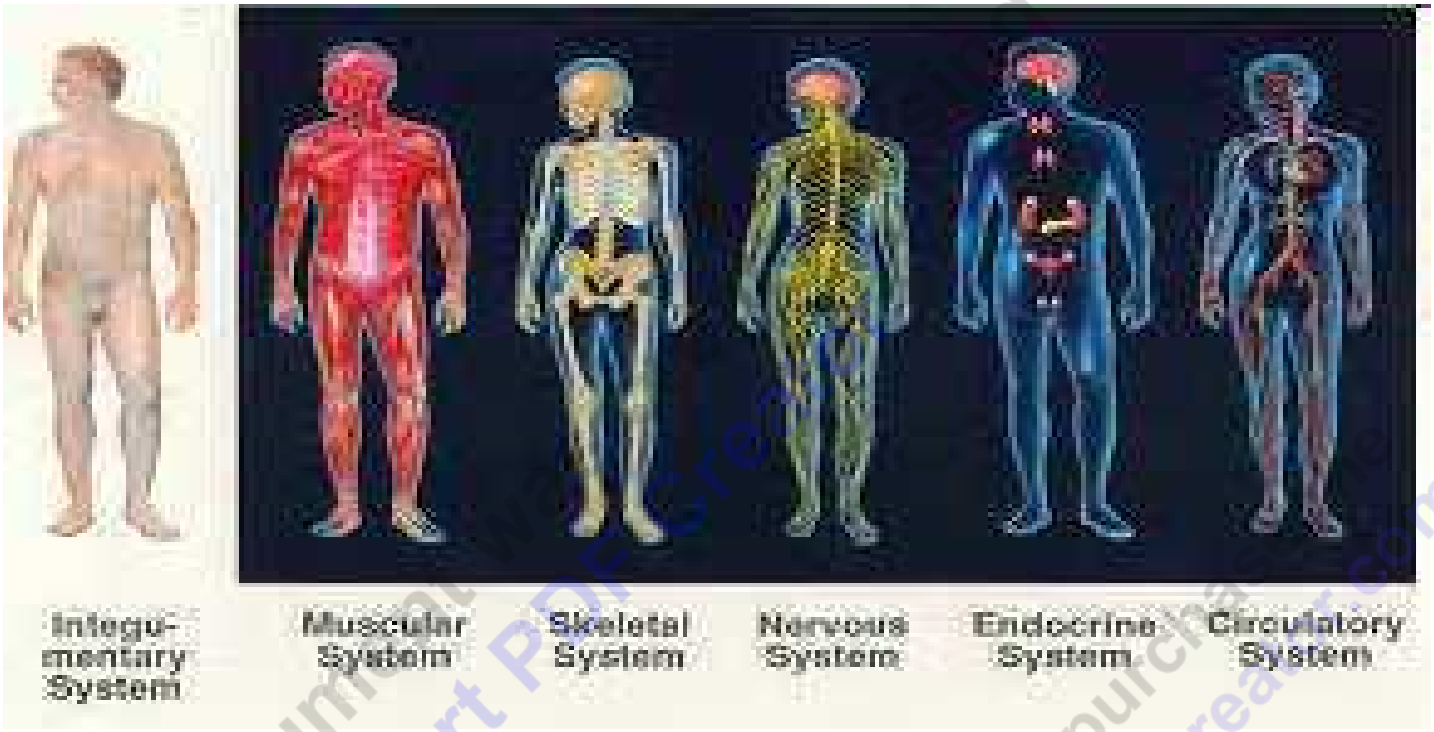
- Humans have some 75-100 Trillion
  - Multi-cellular (More than one cell)
- Some Protista have 1 - Unicellular

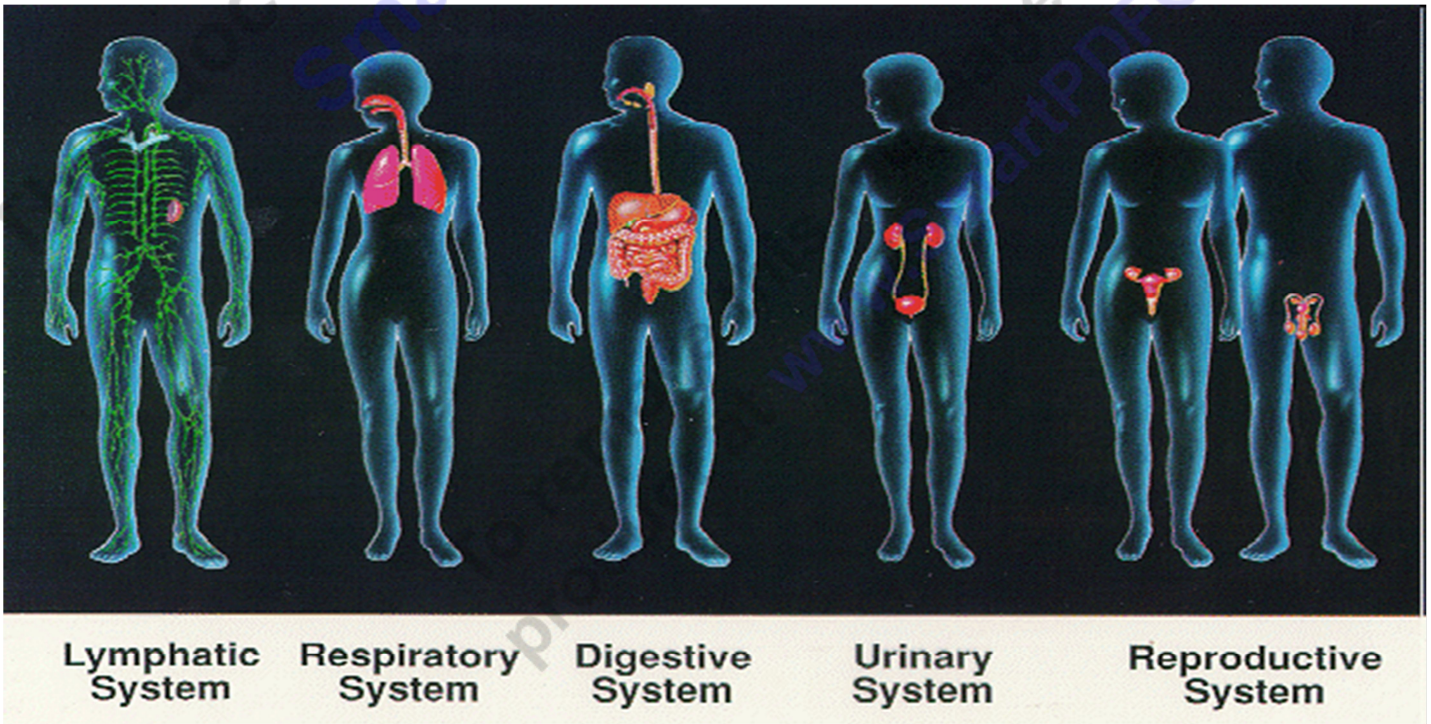
Tissue: A group of similar cells that perform the same function.

Organ: A group of different tissues with a specific job.



Organ System: A group of organs that work together to perform a specific job.





Homeostasis: The ability of an organism or cell to maintain internal equilibrium by adjusting its physiological processes.

- Regardless of outside conditions.

Part II: Area of Focus: The Skeletal System.

An adult human has 206 bones.

- When you are born, you have over 300 bones. They fuse together as you get older.

The skeletal system…

-Provides the shape and form.
-Supports.
-Protects.
- Traumatic brain injury (TBI)
-Produces blood.

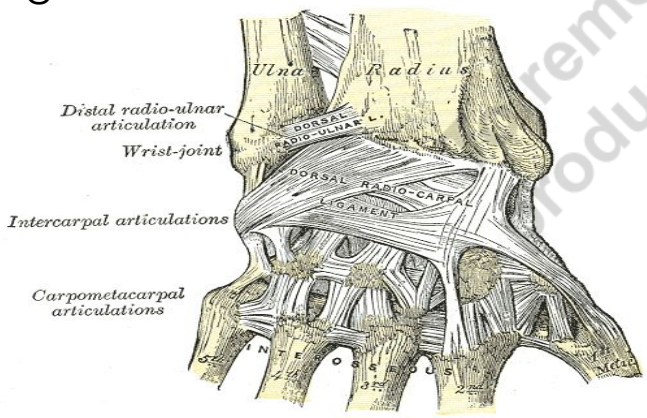
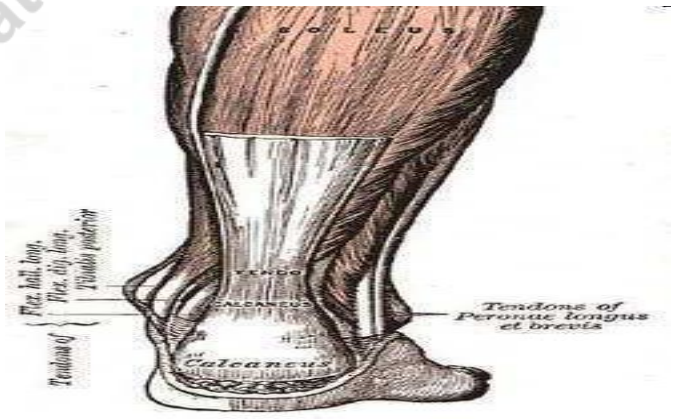
Bones are categorized into several groups.

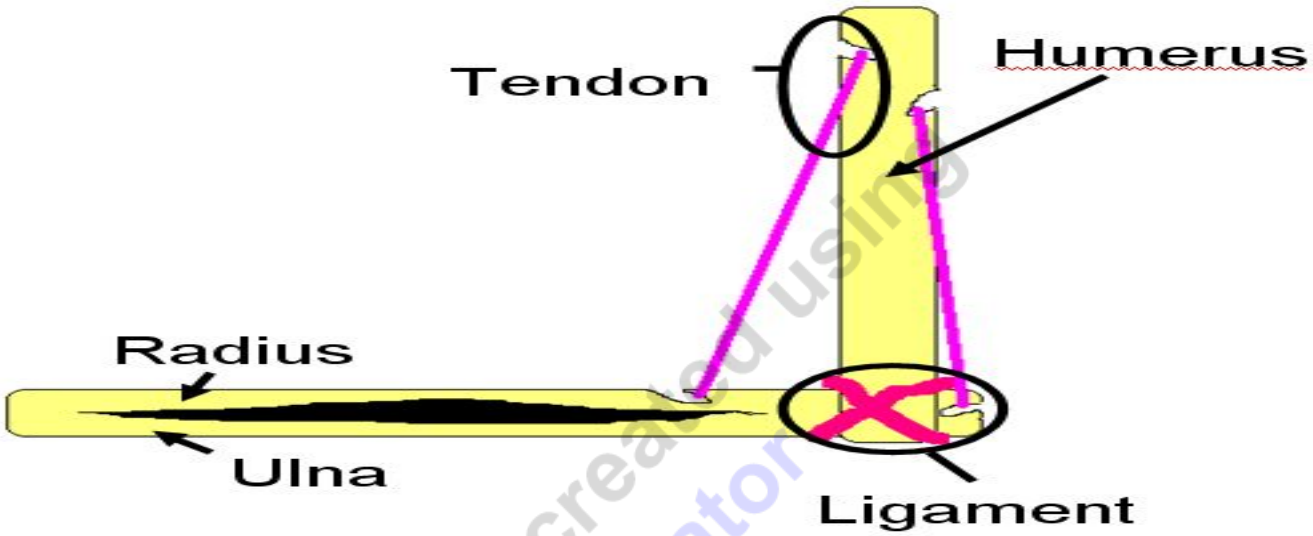
- There are two main categories of bones.
- Spongy Bone
- Compact Bone
  - Long Bones
  - Flat Bones
  - Irregular Bones
  - Short Bones

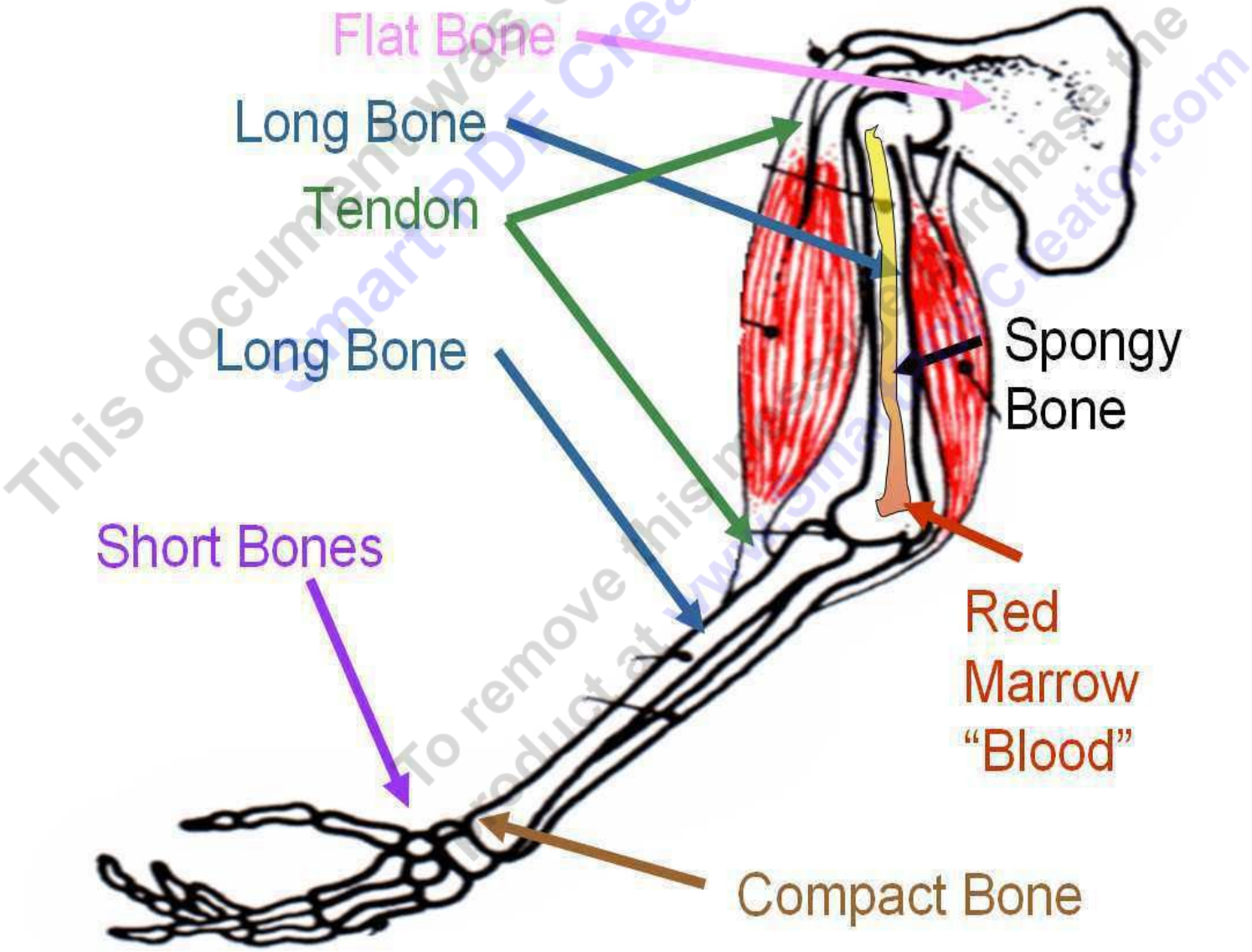
-Allows movement.
-Stores minerals.

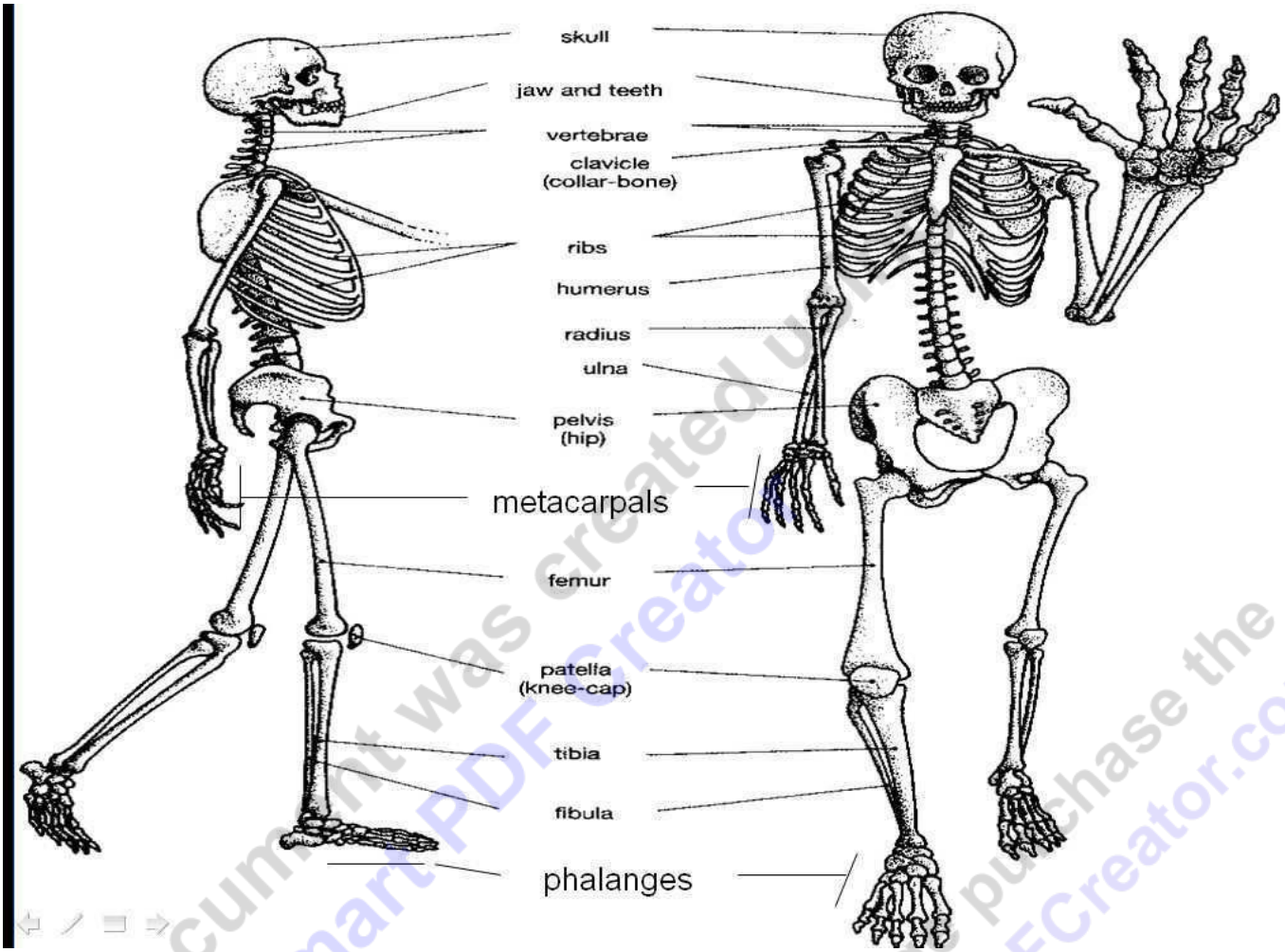
Bones are held together by connective tissues.

- Ligaments: Bones to bones
- Tendons: Bones to muscles

Ligament	Tendon
	







A human joint: A place where two bones meet.

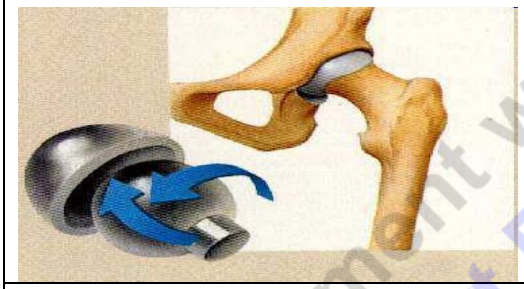
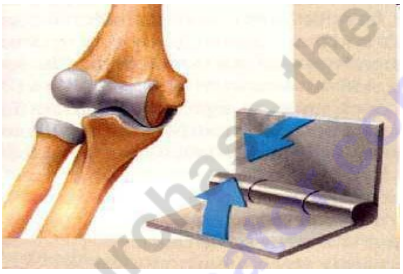
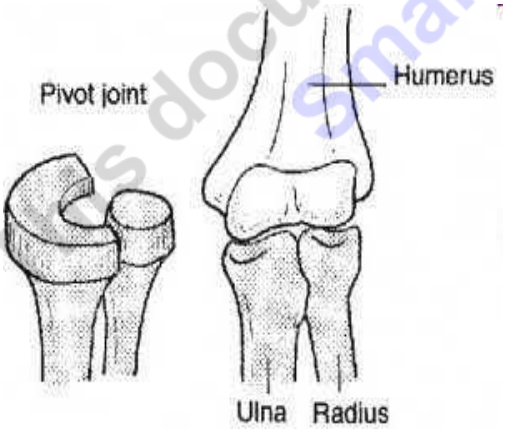
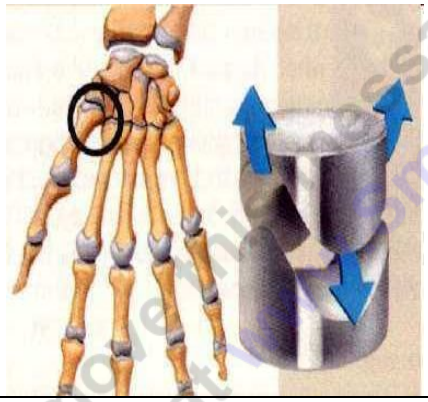
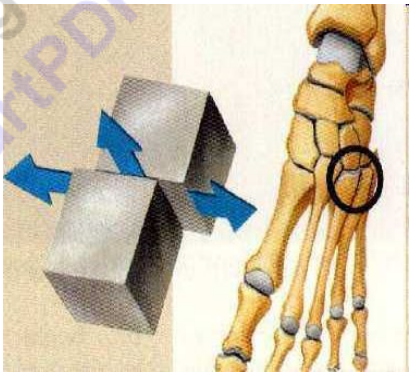
Joints can be…

- A.) Fibrous (immovable)
- B.) Cartilaginous (partially movable)
- C.) Synovial (freely movable)

- PRICE
  - P-Protect
  - R-rest
  - I-Ice
  - C-Compress
  - E-Elevate

The six types of human joints.

- Ball and Socket Joint: Radial movement in almost any direction.
  - Hips and Shoulders.
- Ellipsod Joint: Similar to ball and socket but much less.
- Hinge Joint: Allows extension and retraction.
- Pivot Joint: Rotation around an axis
  - Neck and forearms.
- Saddle Joint: Movement back and forth and up and down.
- Gliding Joint: Bones slide past one another.

Ball and Socket Joint	Ellipsoid Joint	Hinge Joint
		
Pivot Joint	**Saddle Joint**	**Gliding Joint**
		

Part III: New Area of Focus: The Muscular System.

The human body contains 3 types of muscular tissue.

- Skeletal Muscle
- Smooth Muscle
- Cardiac Muscle

Muscle can also be voluntary and involuntary.

- Voluntary muscles you can control

- Involuntary muscles are ones that you can't control.

Muscle Fiber: Long fibers that run parallel to each other and are held together by connective tissue.

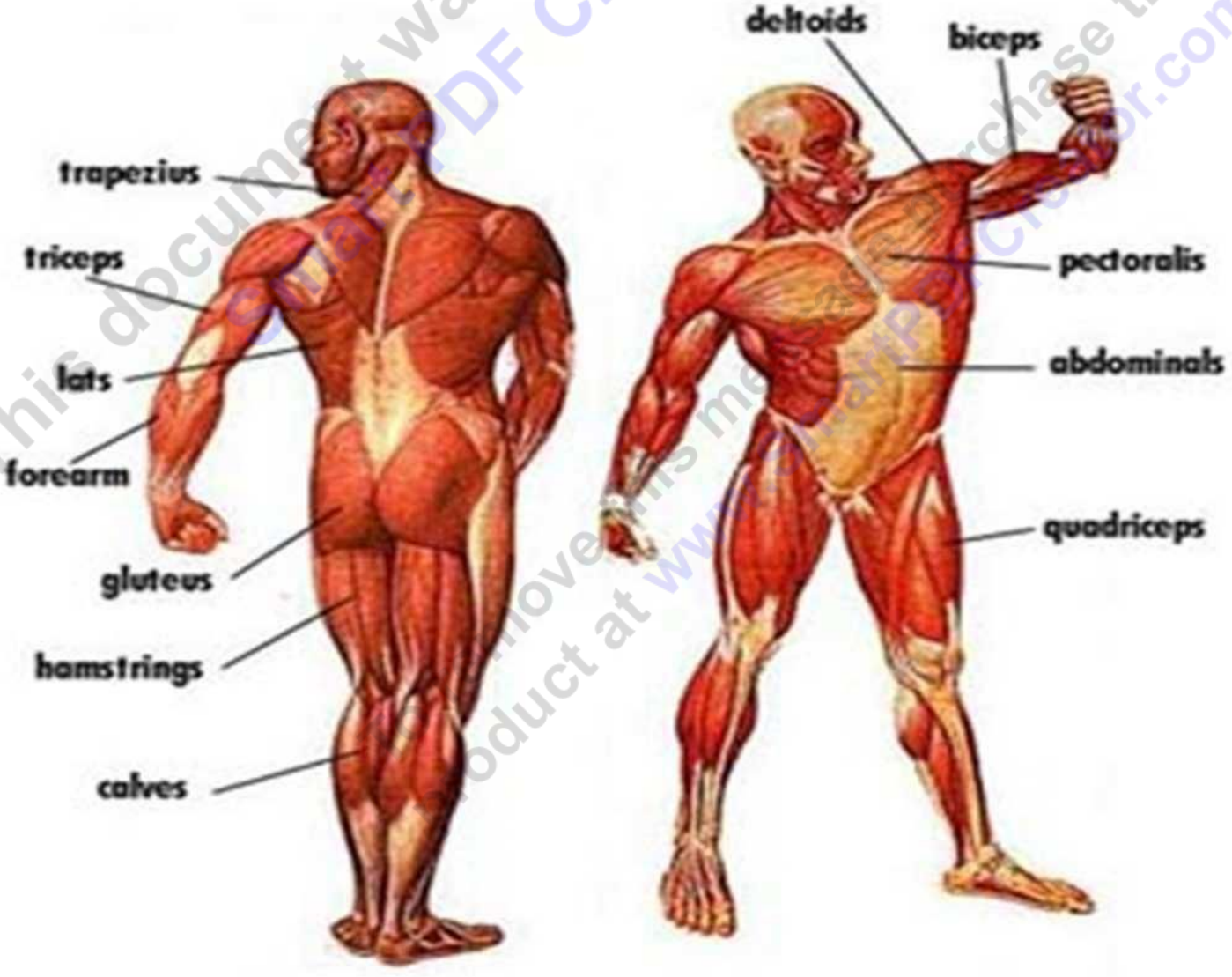
- They contract and relax.

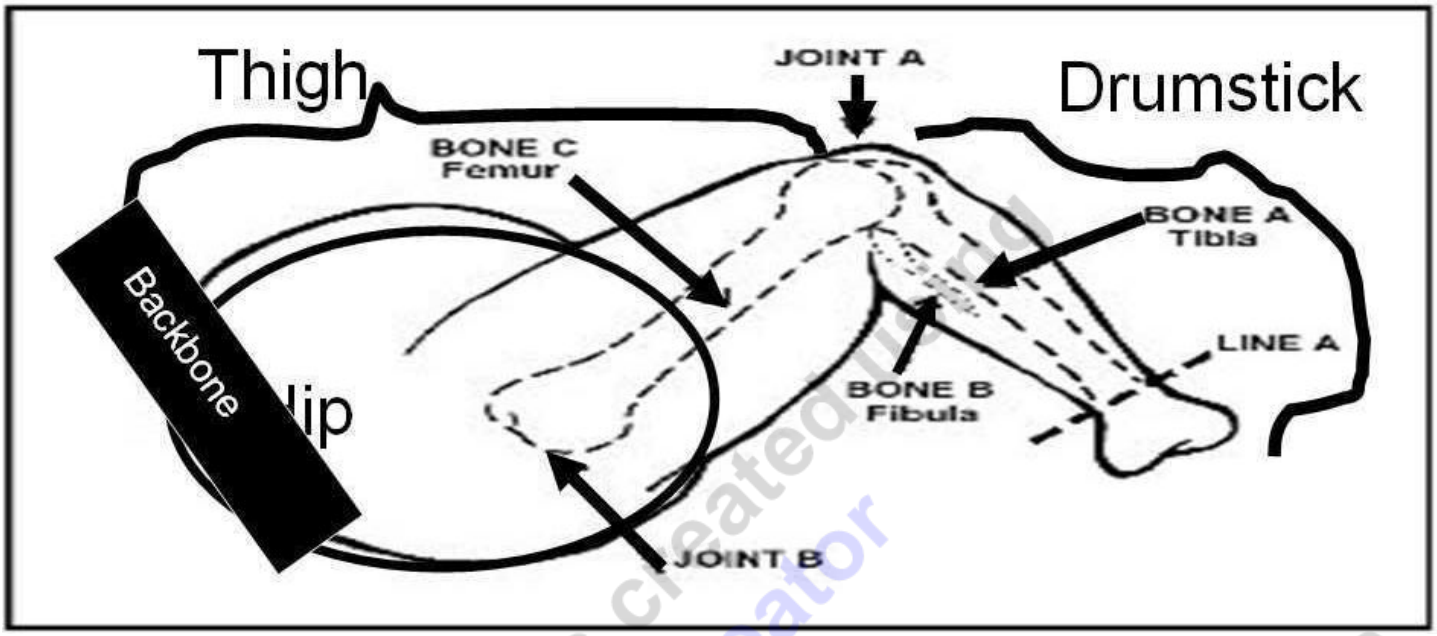
Individual muscles can act only to shorten, and not to lengthen the distance between two attachment points. (Tendons)

- They can only pull, they can't push.

Smooth muscles work by sending a signal in a wave over several cells

- This wavelike action helps in moving food through the intestine.





Part IV: Nutrients and Healthy Living Notes

SPONCH

25 of the elements are essential for life.
SPONCH elements are the most biologically important.

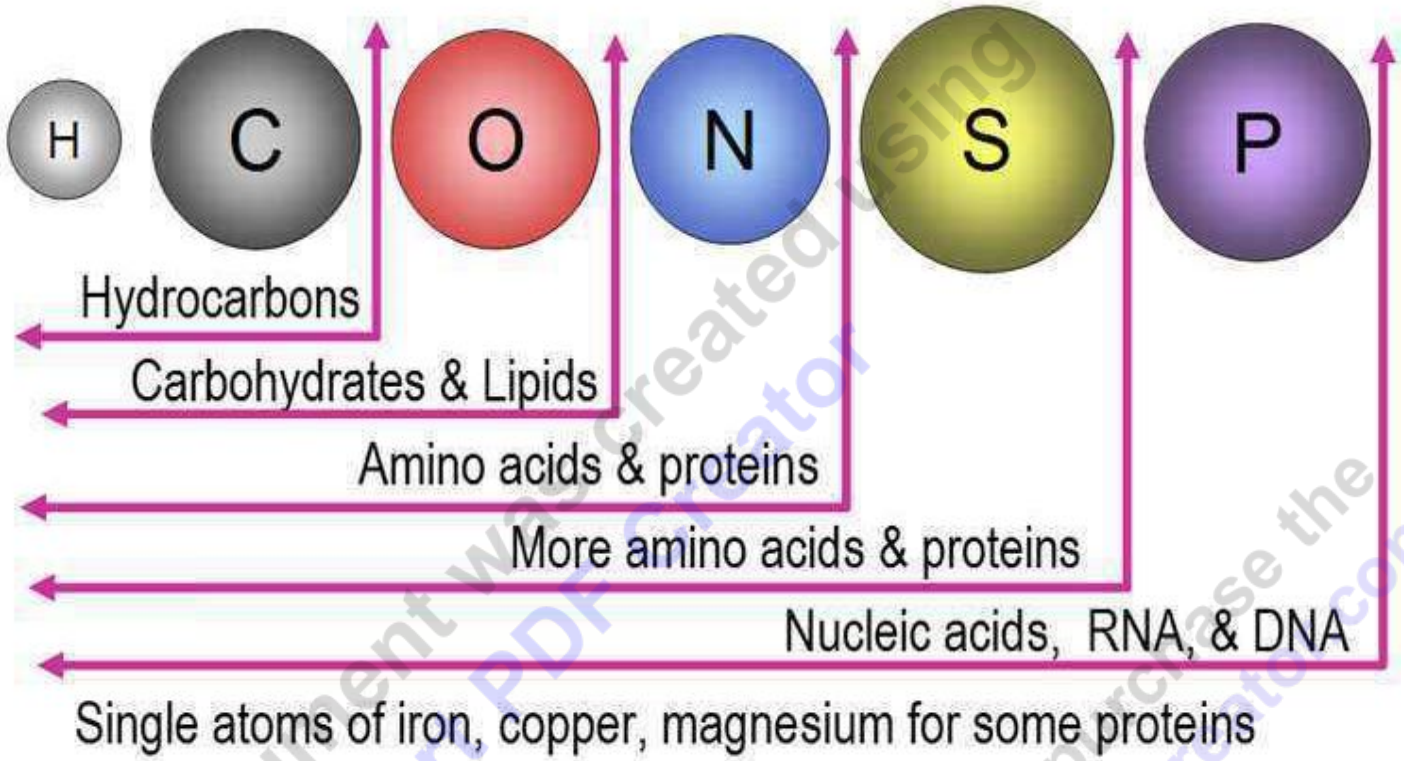
Percentage of SPONCH elements in living things.

- **S.** Sulfur Trace
- **P.** Phosphorus 1.0%
- **O.** Oxygen 65.0%
- **N.** Nitrogen 3.3%
- **C.** Carbon 18.5%
- **H.** Hydrogen 9.56%
- Other (Trace) 3.0%

SPONCH CaFe.
The next most important elements for life.

- Ca= Calcium
- Fe= Iron

Organic Building Blocks



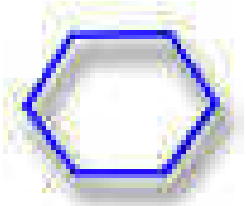
Carbohydrates (sugars) SPONCH

Sugars combine to become more complex

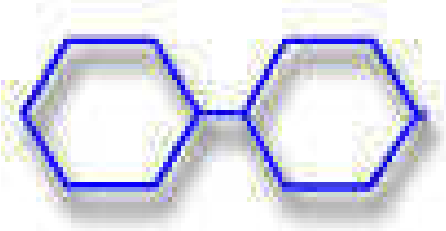
- -Cellulose – Cell Walls in plants
- -Chitin – Insect exoskeleton
- -Starch is a complex sugar (longer lasting energy)

Monosaccharide – one sugar

- Glucose

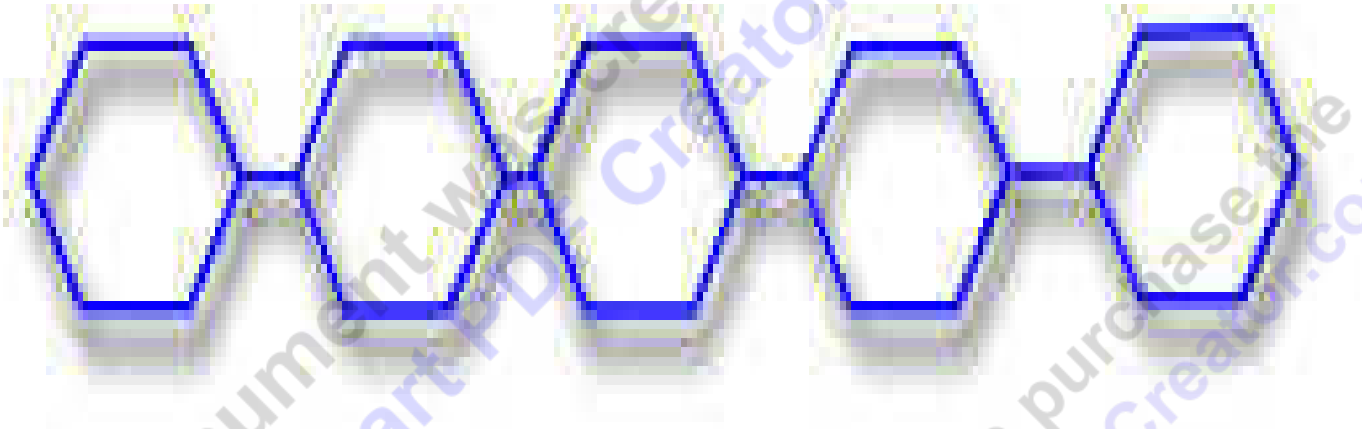


Disaccharides – two sugars



*Poly*saccharides – Many

- Starch, Glycogen and Cellulose



Polymer

- Long complex chains of molecules
- Protein – S O N C H (Amino acid)

Grr…

Growth
repair
reproduction
regulate

Proteins play important role in Grr…
The important roles of a living cell

There are also structural proteins.

- Make list next to stick figure

Hair is a protein
Enzymes - Proteins act as enzymes, which are important in making chemical reactions happen in cells.

Fingernails
Skin
Muscles
Cartilage
Ligaments and tendons
Eyes / cornea
Antibodies – Protect from disease
Hormones

Lipid – C H O (Fatty acid)
Chlorophyll, which is important in photosynthesis, is a lipid.
(AKA-Fats) They store energy.
Cell membranes are made of a type of structural lipid.
Body fat is a good thing. It provides your body with extra energy.

Sex hormones, such as testosterone and estrogen are made of lipids.

Saturated Fats □
Unsaturated fat □ (just a bit however)
Trans Fats □□□

Nucleic Acids – S P O N C H (Nucleotide)
Nucleic acids include DNA, which carries genetic information, and RNA, which translates that information into proteins.

Dangers of obesity
- □ -increased risk of heart disease
- □ -high blood pressure
- □ -Type 2 diabetes
- □ -breathing problems
- □ -Increased risk of stroke
- □ -Cancers

Why Fast Food Sells
It's Cheap
It's Fast
It Tastes Good (Saturated Fats)
It's Readily Available
It's Readily Available
Consistency - I know what I'm getting.
Comes with cheap plastic toys
It's a safe place to be.
Heavy media advertising.

Anorexia is an eating disorder where people starve themselves.

Dangers of being to thin
- □ Bones weaken
- □ Irregular heartbeat.
- □ Stunting of growth (permanent).
- □ Loss of menstrual cycle.
  - □ Extreme – loss of ability to have children
- □ Body has little stored energy

- During a sickness you may need that energy.

Bulimia nervosa – Binge eating and then purging (throwing up).

- Erosion of tooth /Cavities.
- Swelling and soreness in the salivary glands (from repeated vomiting).
- Stomach ulcers
- Ruptures of the stomach and esophagus.
- Disruption in the normal bowel release function.
- Dehydration.
- Irregular heartbeat and in severe cases a heart attack.
- A greater risk for suicidal behavior.
- Decrease in libido (sex drive).

Steroids: A naturally occurring complex ringed lipid in the body. They take part in many important body functions.

Anabolic steroids: A group of 100+ man made hormones used to stimulate muscle and bone growth.

Part V: New Area of Focus: Learning About Our Foods.

Calorie: 1 calorie = 4.18400 Joules

1) The amount of energy in food that is available through digestion.
2) A unit of heat equal to the amount of heat required to raise the temperature of one kilogram of water by one degree at one atmosphere pressure.

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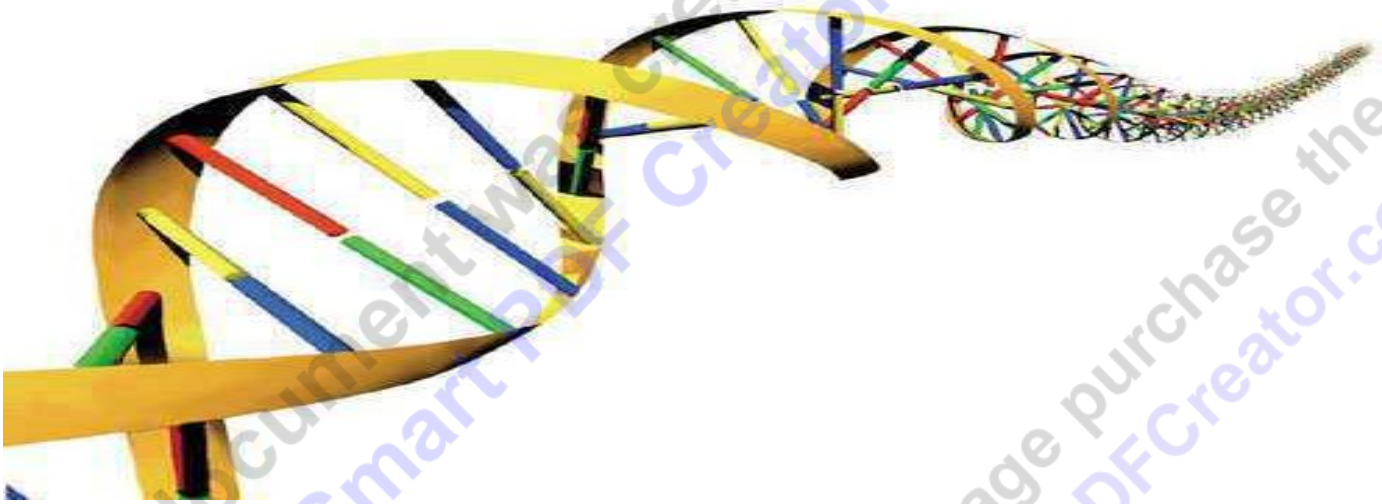
Nucleic Acids – S P O N C H (Nucleotide)

- DNA (Deoxyribose Nucleic Acid) Controls reproduction.



RNA (Ribose Nucleic Acid) Makes and transfers proteins.
Stores information such as your genetic code.

Part VI: New Area of Focus: The Digestive System

Nutrients: The usable portions of food.

Nutrients include

- Proteins
- Carbohydrates
- Fats
- Vitamins
- Minerals
- Water

Protein: Growth, Repair, Reproduction of Cells (structure of your body), produces enzymes, hormones, antibodies.

Carbohydrates: Energy molecule and contains fiber.

Fats: Energy source.

Vitamins: Prevents diseases, regulates body processes, and needed for chemical reactions.

Minerals: Needed for bones and teeth, blood and other tissues.

Water: To dissolve substances in blood, tissue fluid, biochemical reactions.

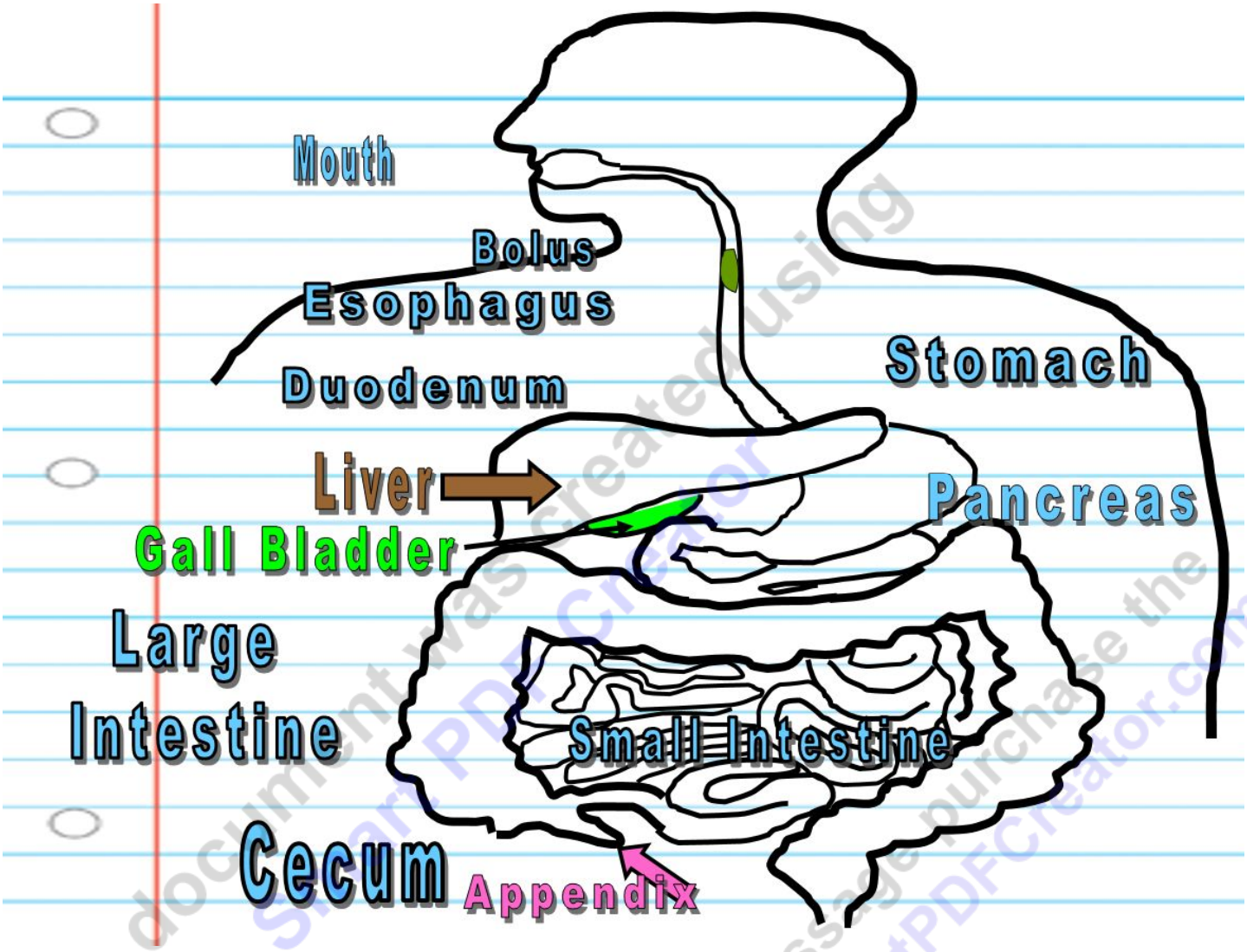
Digestion: The process of breaking food down into nutrients.

Ptyalin: Chemical (Enzyme) in salvia that breaks starches into sugars.

Chemical Digestion: Process of converting food into chemical substances that can be absorbed and used.

Mechanical Digestion: Physically breaking down the food.

Peristalsis: Waves of rhythmic muscular contractions that push / move food.



Stomach: A saclike part of the alimentary canal in which food is stored.

Cells in the stomach wall release a chemical gastric juice (Pepsin – enzyme) and thick slippery mucus to protect stomach.

- Pepsin contains hydrochloric acid.

Duodenum: The beginning of the small intestine.

- Distributes bile (produced by the liver and stored in the gall bladder), pancreatic acids (pancreas), and other secretions to chemically breakdown food.

Small Intestine: Major organ for food absorption.

Digestive Juices	Digestive Enzyme	Works On	Changes To
Saliva	Ptyalin	Starch	Simple Sugars
Gastric (Stomach)	Pepsin	Protein	Peptides and Amino Acids
Pancreatic	Amylase Trypsin Lipase	Starch Protein Fats	Complex Sugars, simple Proteins, Fatty Acids, Glycerol
Intestinal	Lactase, Maltase, Sucrase, Lipase, Peptidase	Complex Sugars, Simple Proteins, Fats	Simple Sugars, Amino Acids, Fatty Acids, Glycerol

Pancreas: Organ that aids in digestion by producing pancreatic juices that enter small intestine.

Liver: Large, heavy, vital organ that produces bile that breaks down fats.

- Also detoxifies chemicals
- Synthesizes proteins
- Stores Glycogen (energy)
- Decomposes red blood cells
- Hormone production

Gall Bladder: A small pear-shaped organ that stores and concentrates bile from the liver.

The nutrients in your food get broken down into small substances (molecules) and are absorbed into your bloodstream.

- Proteins to Amino Acids
- Starches to simple sugars
- Fats to Fatty Acids and Glycerol

The small intestine is covered with millions of small fingerlike structures called villi.

Large Intestine: Water is absorbed; bacteria in the intestine also make important vitamins.

Rectum: Short tube at the end of the large intestine that stores waste.

Part VII: New Area of Focus: The Circulatory System

Circulatory System: Delivers food and oxygen to the body and carries carbon dioxide and other waste products away.

Consists of the following

- Heart
- Blood Vessels
- Blood

Cellular Respiration: Processes whereby certain organisms obtain energy from organic molecules.

Cellular Respiration

$C_6H_{12}O_6 + 6O_2 = \text{Released Energy} + 6CO_2 + 6H_2O$

The functions of the circulatory system.

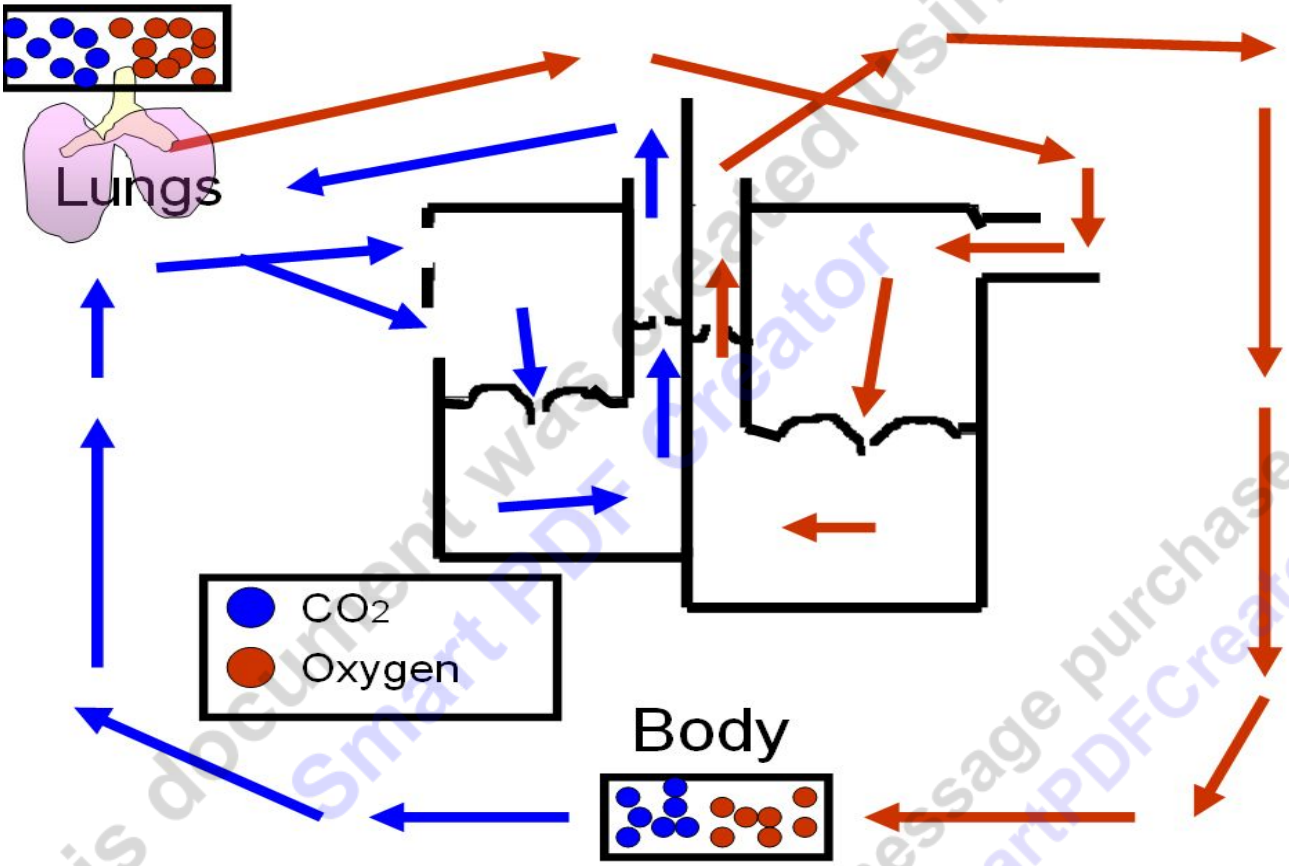
- To deliver food and oxygen to cells.
- To carry away waste.
- To aid in disease prevention.
- To deliver chemical messages (hormones).

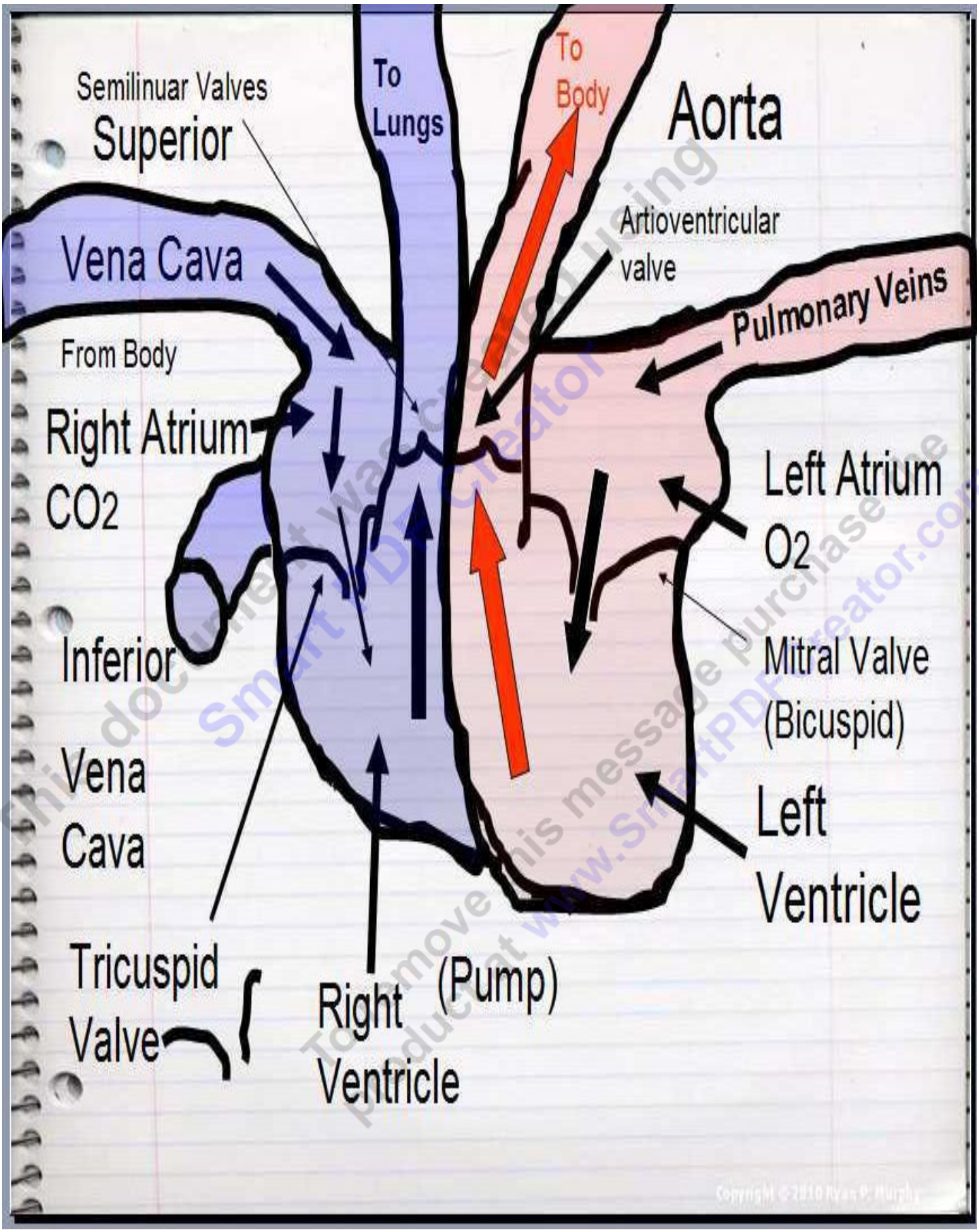
The circulatory system

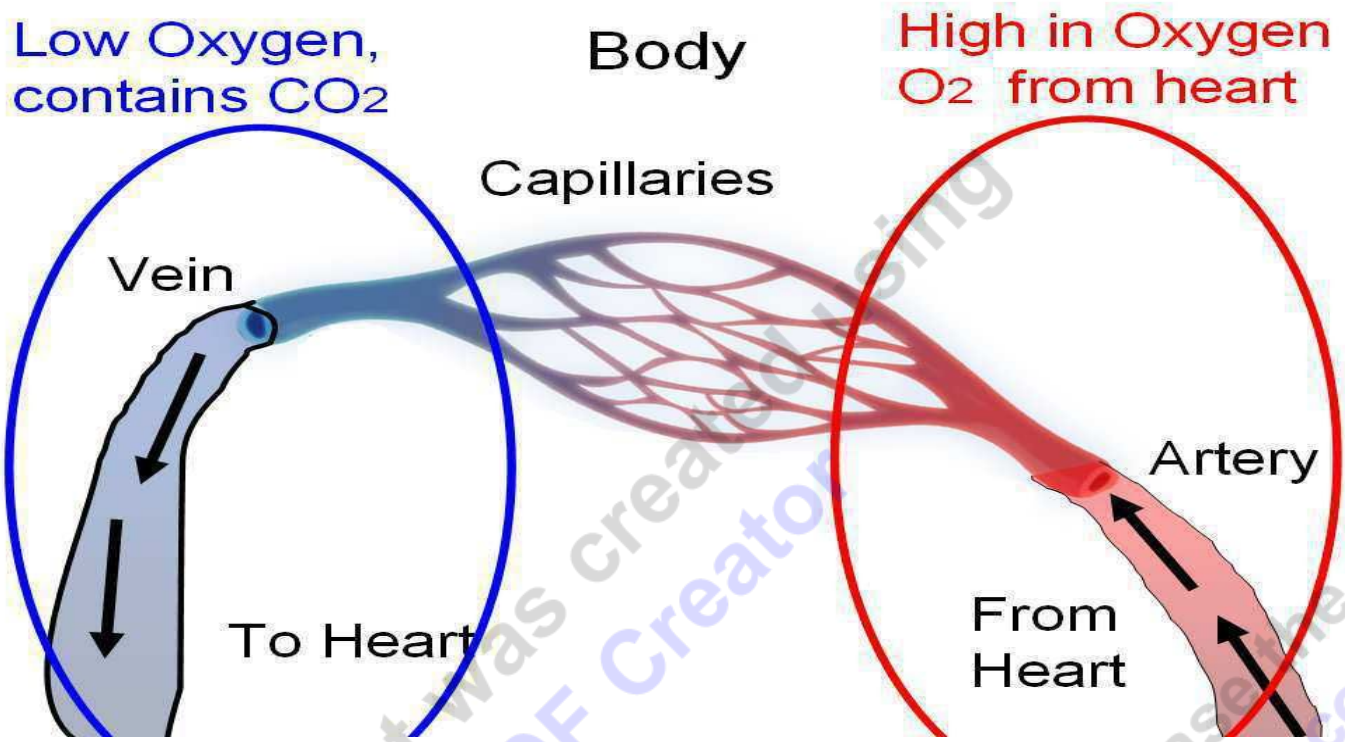
- Powered by the heart.
- Blood carries food, oxygen, waste, chemical messages.
- Blood vessels provide the paths of travel and have unique structures.

Human Heart: Important organ that provides a continuous circulation of blood.

Bright Red = Oxygen Rich
Blue = Oxygen Poor







Artery: Blood vessel that carries blood away from the heart.
Capillary: Extremely thin blood vessels.
Vein: Blood vessel that carries blood toward the heart.

Avoid Cardiovascular Disease

- A number of diseases that can affect the heart and blood vessels. Many can be prevented.
- Getting proper exercise and diet can keep your system working properly.

Some common diseases…

Atherosclerosis: Thickening of artery walls, fats such as cholesterol collects on wall, over time it may block blood flow (heart attack).

Blood: A specialized bodily fluid that delivers necessary substances to the body's cells.

Blood is made up of…

- Red Blood Cells
- White Blood Cells

- Platelets
- Plasma

Plasma: Fluid of blood, 90% water, 10% sugars, fats, salts, gases, and proteins.

- Controls amount of water in blood
- Has antibody proteins that fight off disease
- Blood clotting agents
- Carries chemical messages (hormones)
- Carries waste products

Red Blood Cells: Produced in bone marrow, no nucleus in cell (mature cell), delivers oxygen to cells, and carries away CO_2.

- Hemoglobin: Protein in blood that helps blood bind with oxygen and carbon dioxide.

White Blood Cells: Circulate throughout the body providing protection against foreign organisms and matter.

Platelets: Irregularly shaped bodies with sticky surfaces that form clots to stop bleeding.

Antibodies cling to a virus. They will prevent the virus for infecting a cell.

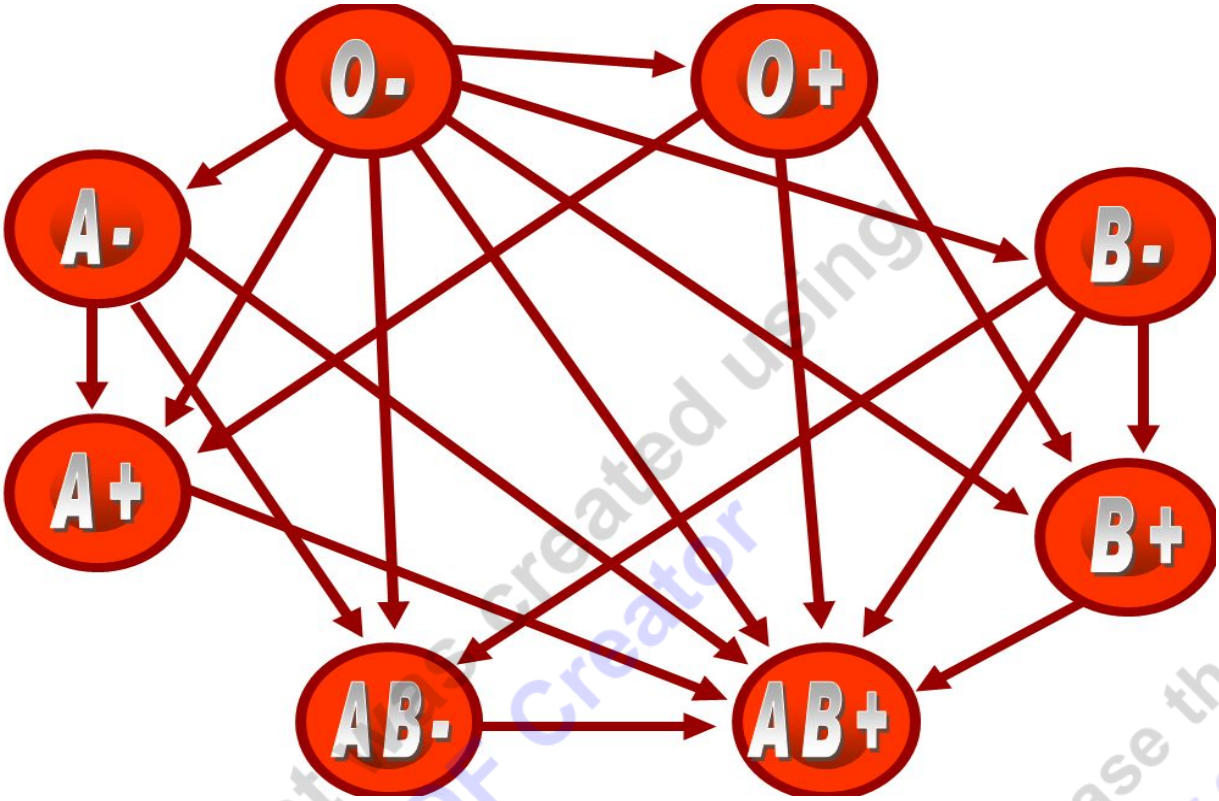
Antigen: A substance that when introduced into the body stimulates the production of an antibody.

There is another antigen that some people may have.

- If you have it you're… Rh+
- If you don't you're… Rh-

- Rh+ should not share blood with someone who is Rh-
- Rh- can give to a person who is Rh+

Blood Types, A-, A+, B+, B-, AB-,AB+, O-,O+



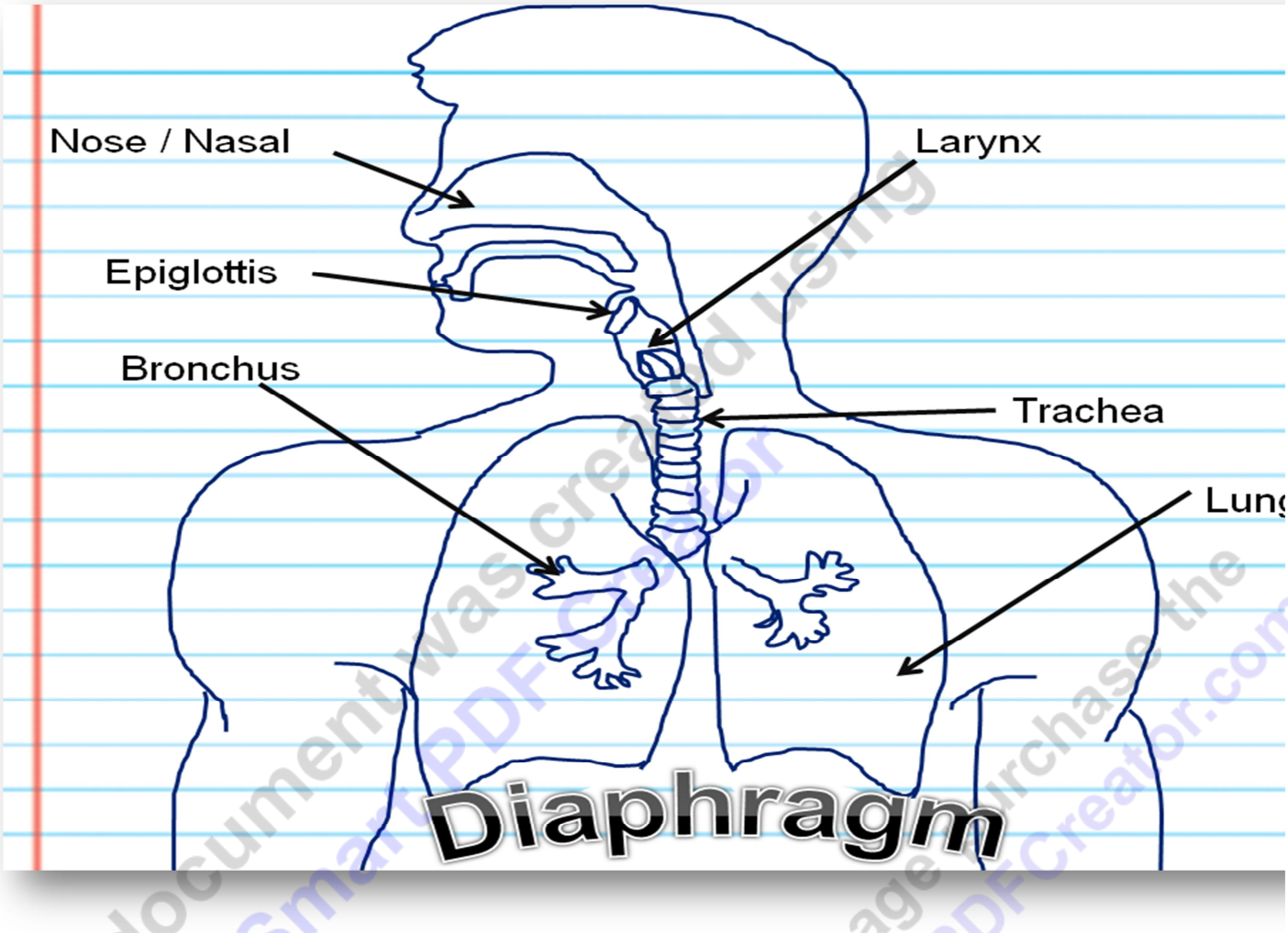
- **Lymphatic System: A part of the circulatory system, comprising a network of lymphatic vessels that carry a clear fluid called lymph.**
  - **Lymph is essentially recycled blood plasma.**
  - **Plays an important part in the immune system.**

Part VIII Area of Focus: The Respiratory System

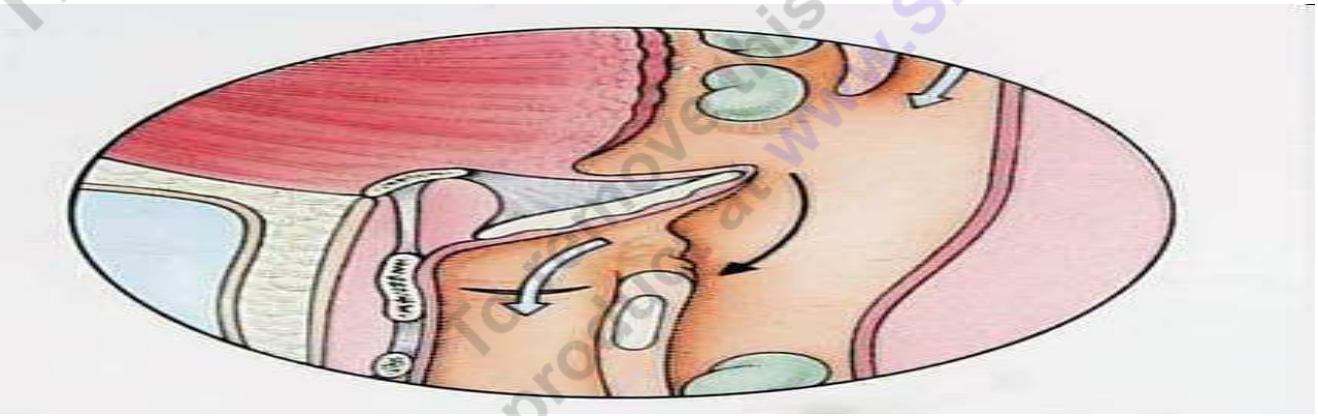
The energy releasing process is called cellular respiration.
$6O_2+C_6H_{12}O_6$ Release of Energy $6CO_2$ and $6H_2O$

Respiratory System: System responsible for supplying oxygen to the body and removing carbon dioxide.

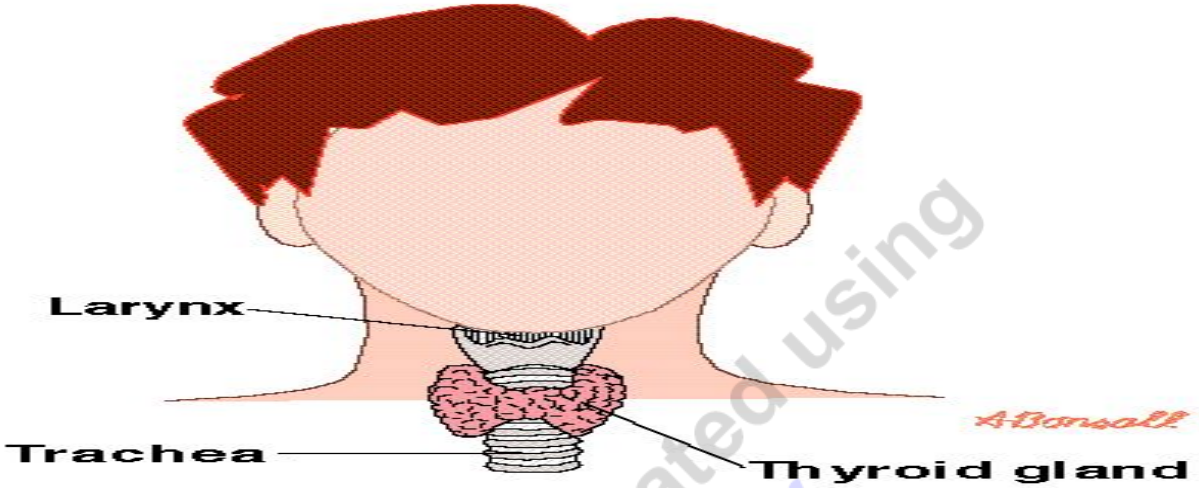
The Nose
- Filters Particles.
- Moistens the Air.
- Warms the Air.



Epiglottis: A flap of cartilage at the roof of the tongue, which is depressed during swallowing to cover the opening of the windpipe.



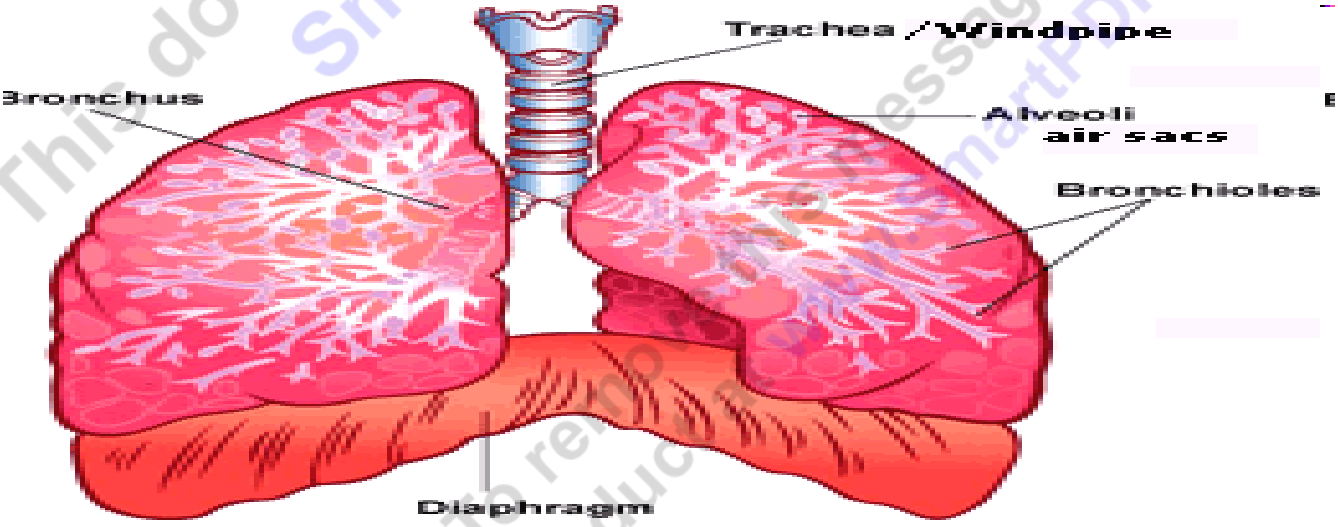
Larynx: The hollow muscular organ forming an air passage to the lungs and holding the vocal cords.



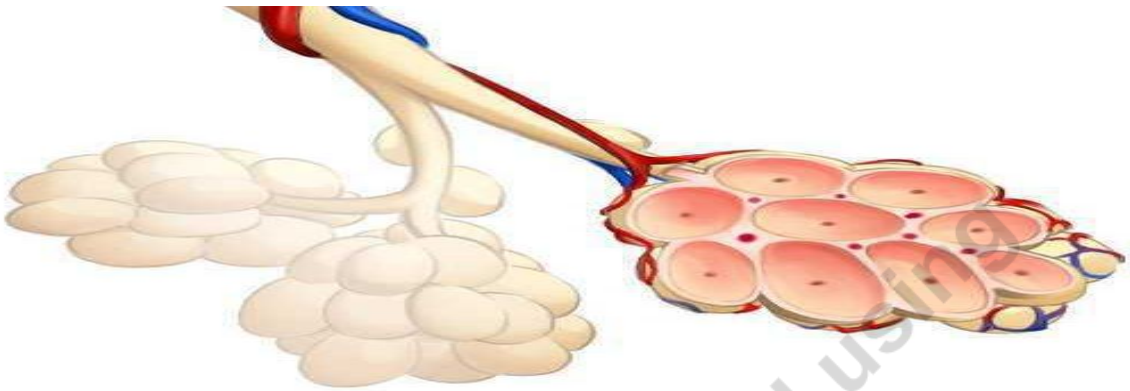
Trachea: Tube in your throat that carries air to your lungs (windpipe)
Cartilage rings

Bronchus: Airway in the respiratory tract that conducts air into the lungs.

Lungs: Either of two saclike respiratory organs in the chest of vertebrates; serves to remove carbon dioxide and provide oxygen to the blood.



Alveoli: Any of the many tiny air sacs in the lungs where the exchange of oxygen and carbon dioxide takes place.



Diaphragm: Dome shaped muscle and membranous partition that separating the abdominal and thoracic cavities.

- a major muscle aiding inhalation.

As you inhale, your diaphragm flattens out allowing your chest to expand and allows more air to flow into your lungs.

- Air pressure decrease, air then rushes into your lungs.

As you exhale, your diaphragm relaxes to a normal state. Space in chest decreases.

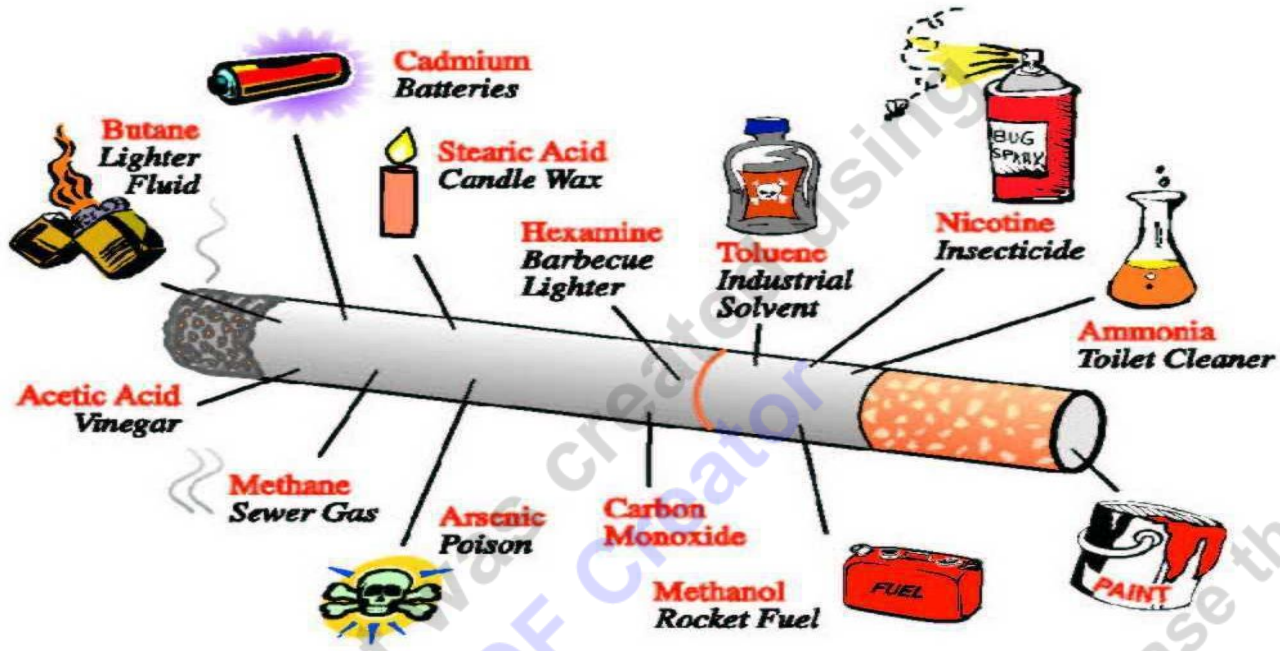
- Air pressure increases, air then rushes out of your lungs.

Cancer is: Uncontrolled, unregulated cell growth and reproduction. Mitosis out of control.

A few things that may help you avoid cancer.

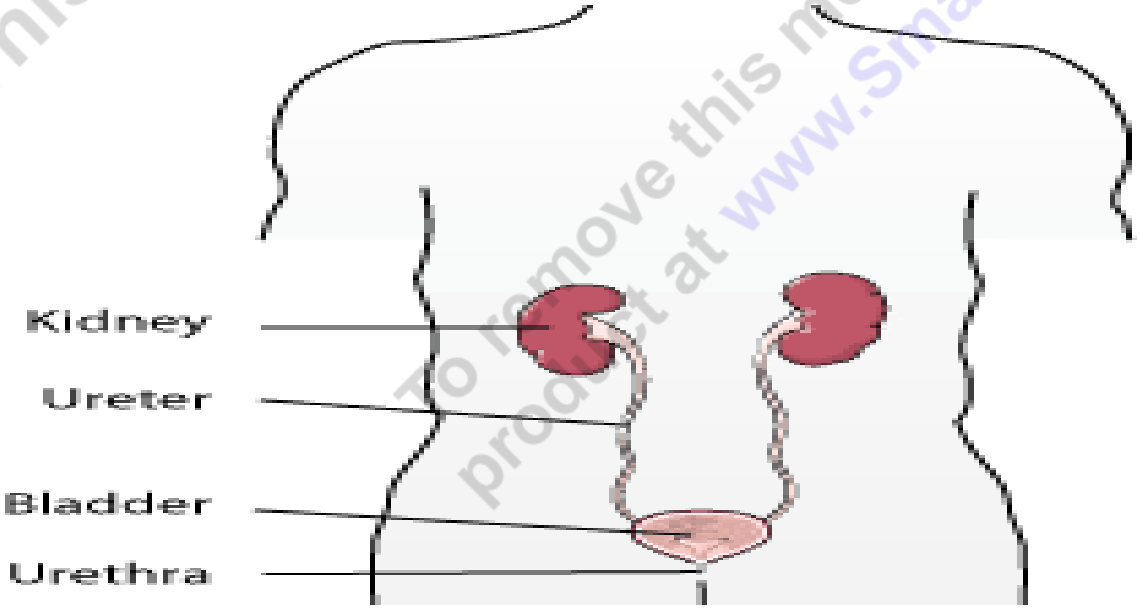
- Don't smoke or chew
- Avoid UV exposure (skin cancer)
- Exercise daily
- Eat healthy
- Don't drink excessive alcohol
- Avoid radiation / energy exposure
- Avoid unprotected sex (HPV virus)
- Get regular checks up with your doctor

What's in a cigarette?



Part IX - New Area of Focus: The Excretory System

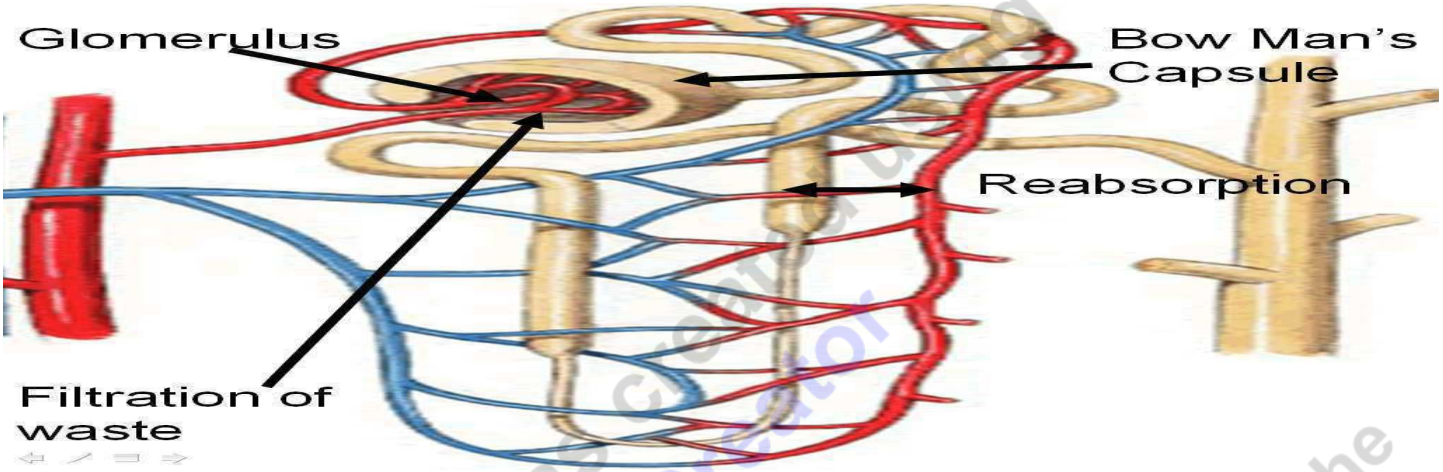
The excretory system provides a pathway to remove wastes from the body.



The kidneys process about 200 quarts of blood and produce 2 quarts of waste product (urine).

- The urine travels through the ureters to the bladder

NEPHRON



The kidneys measure out chemicals such as sodium, phosphorus, and potassium and release them back to the blood to return to the body.

- The kidneys regulate / balance the body's level of these substances.

Urine travels from the kidneys through narrow tubes called ureters to the bladder.

Urinary Bladder: Stores urine until excretion.

Urethra: Tube that connects the urinary bladder to the genitals for the removal of fluids out of the body.

The Liver: Vital organ that among other jobs filters toxins from the blood.

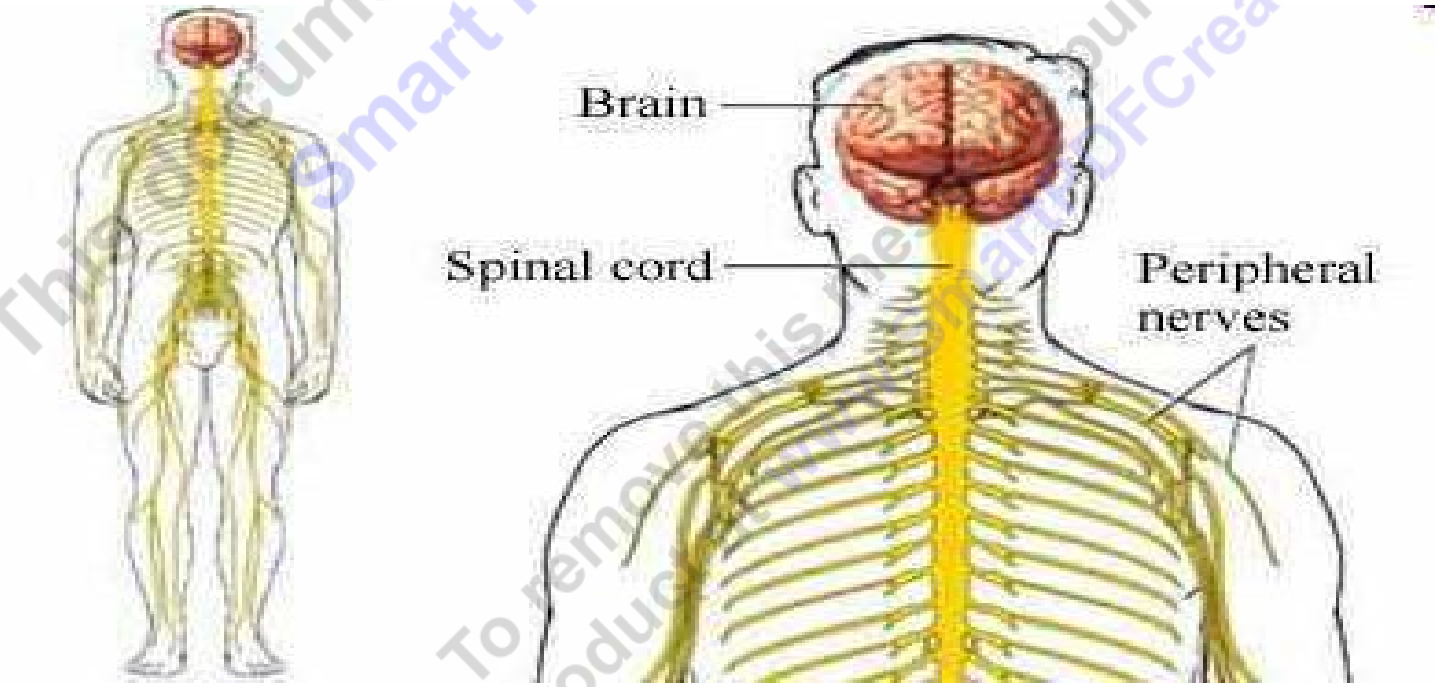
Skin: Large organ that covers body.

- Aids in protection
- Keeps in moisture
- Makes new skin (repair)
- Regulates body temp.

Part X: New Area of Focus: The Nervous System

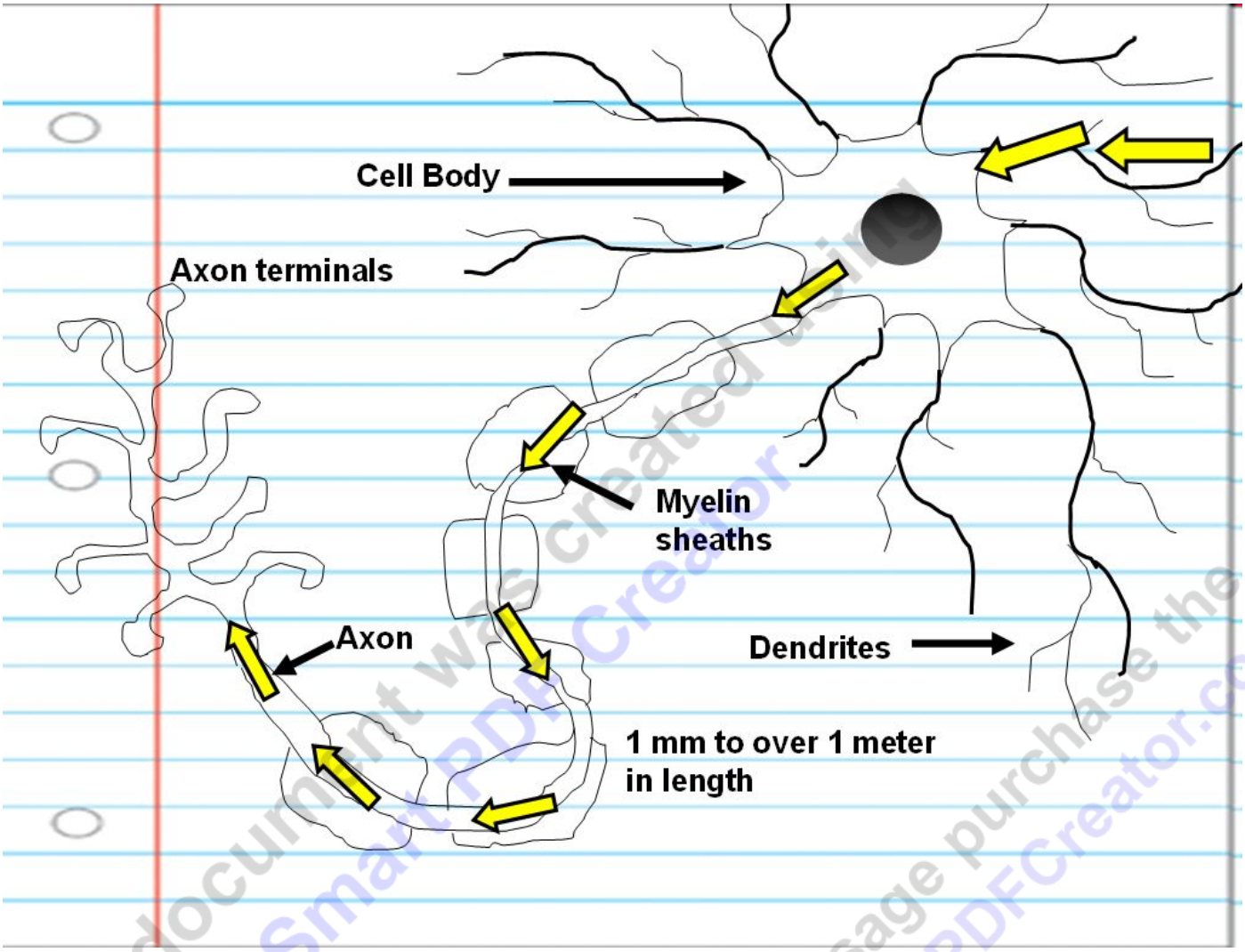
The nervous system receives and then sends out information about your body.

It also monitors and responds to changes in your environment.



Neuron: A specialized cell transmitting nerve impulses.

- Electrical and chemical signaling.

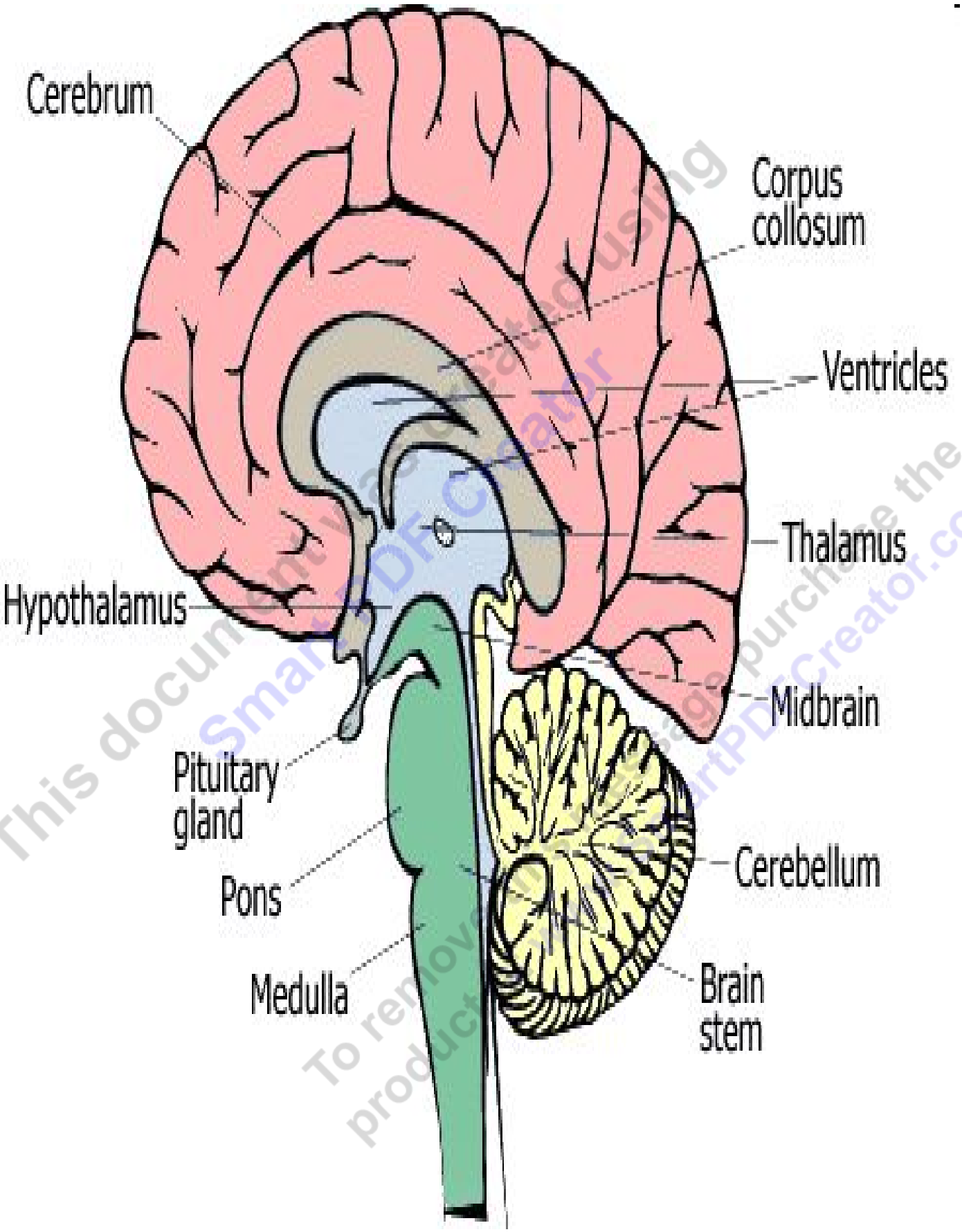


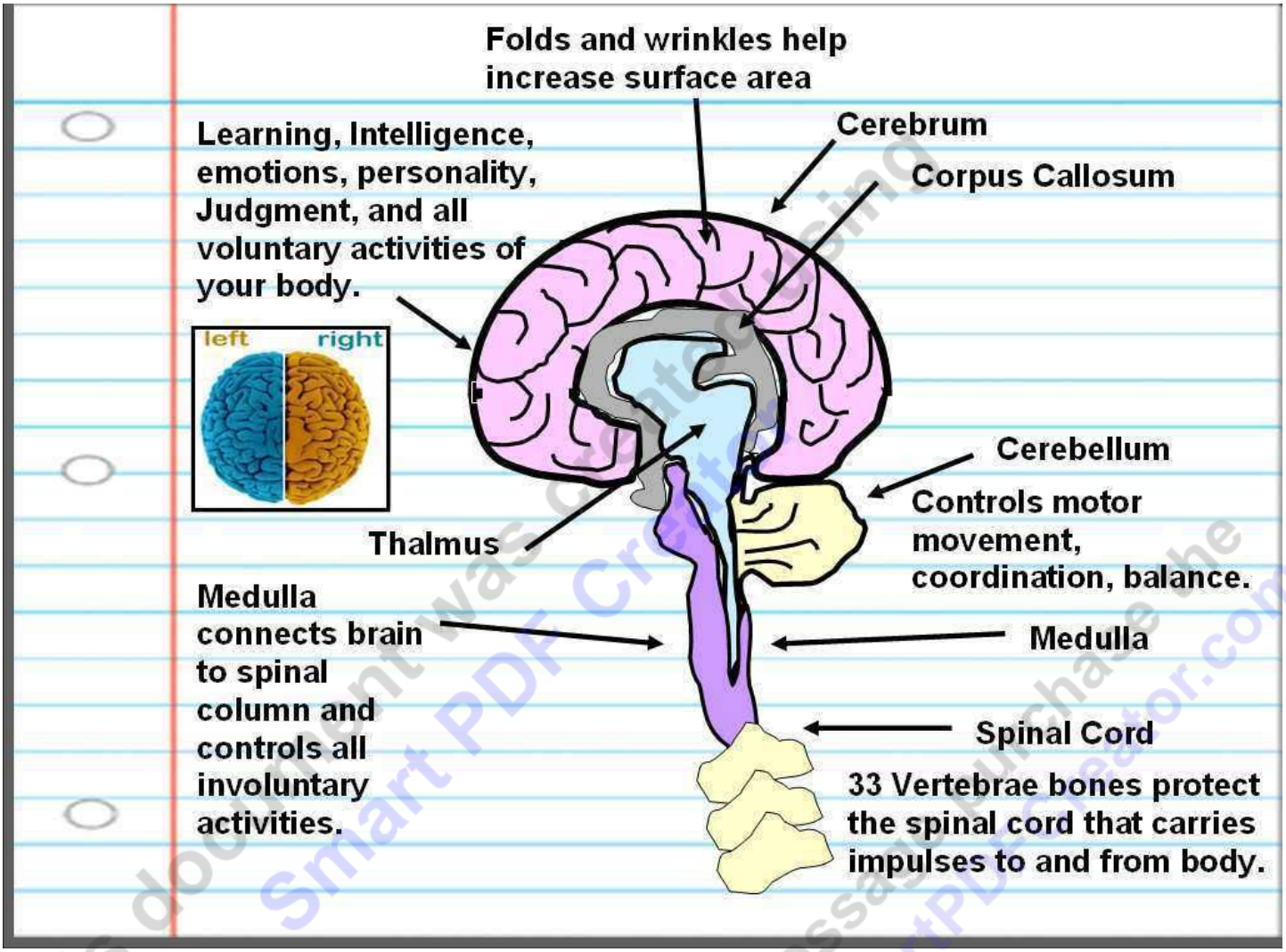
There are three types of neurons.

- Sensory neurons: Conducts impulses inwards to the brain or spinal cord.
- Interneurons: Transmits impulses between other neurons. (Brain and Spinal Column)
- Motor neurons: Pathway along which impulses pass from the brain or spinal cord to a muscle or gland.

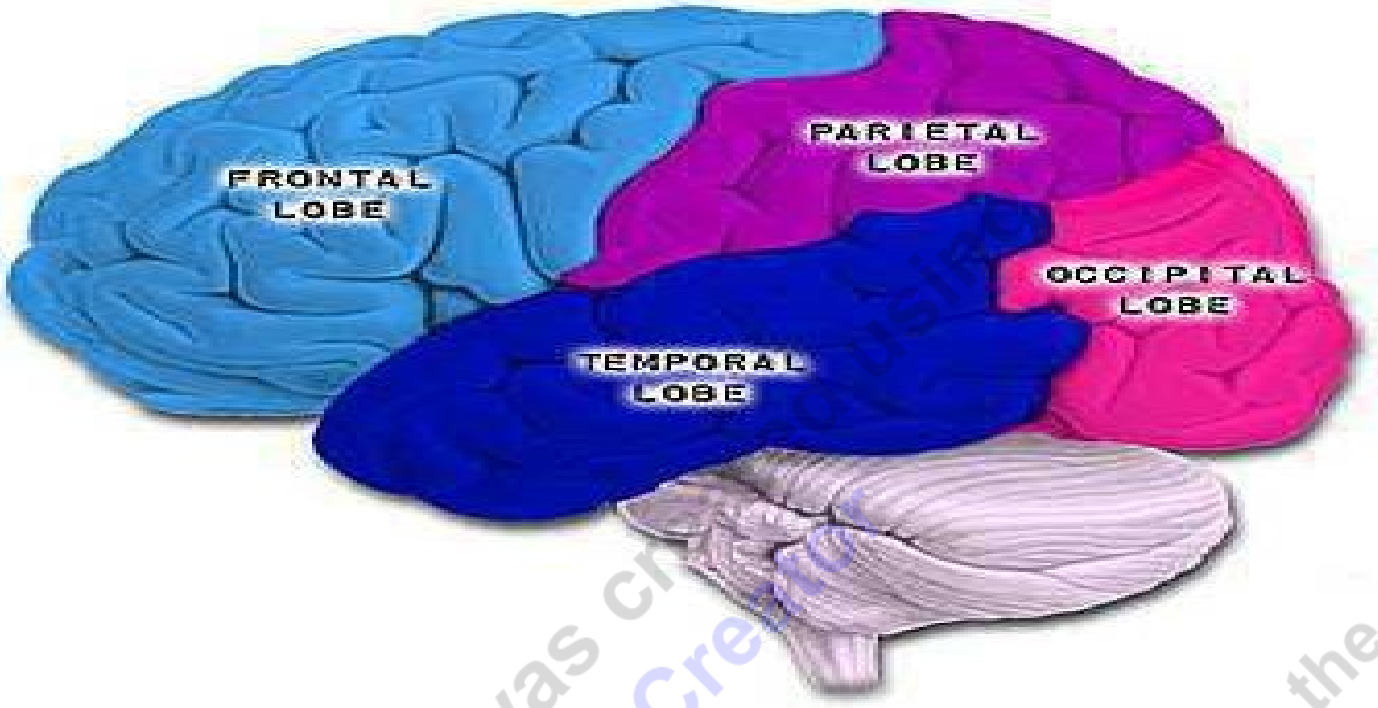
The Central Nervous System: Brain and Spinal Cord Control center of the body.

Peripheral Nervous System: Network of nerves throughout body.

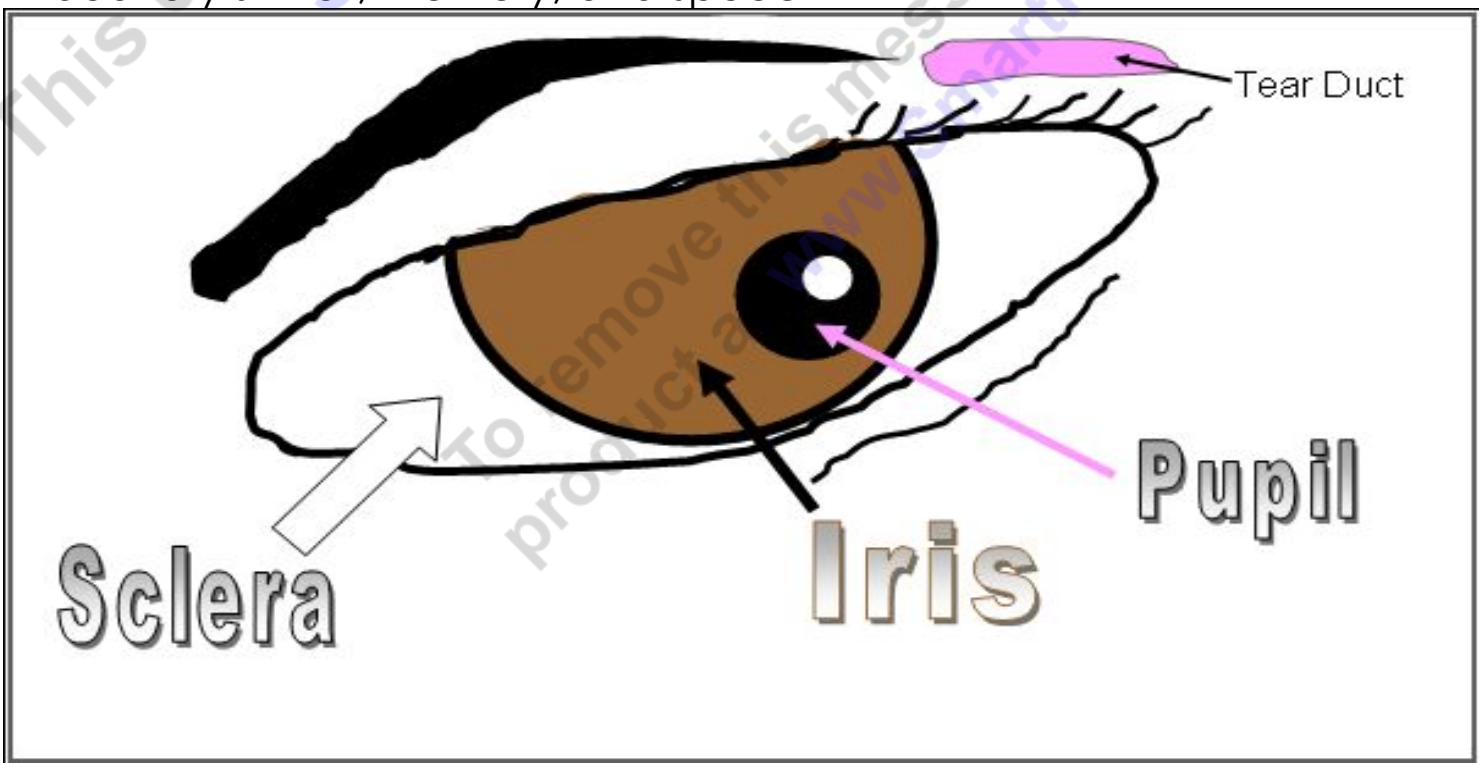


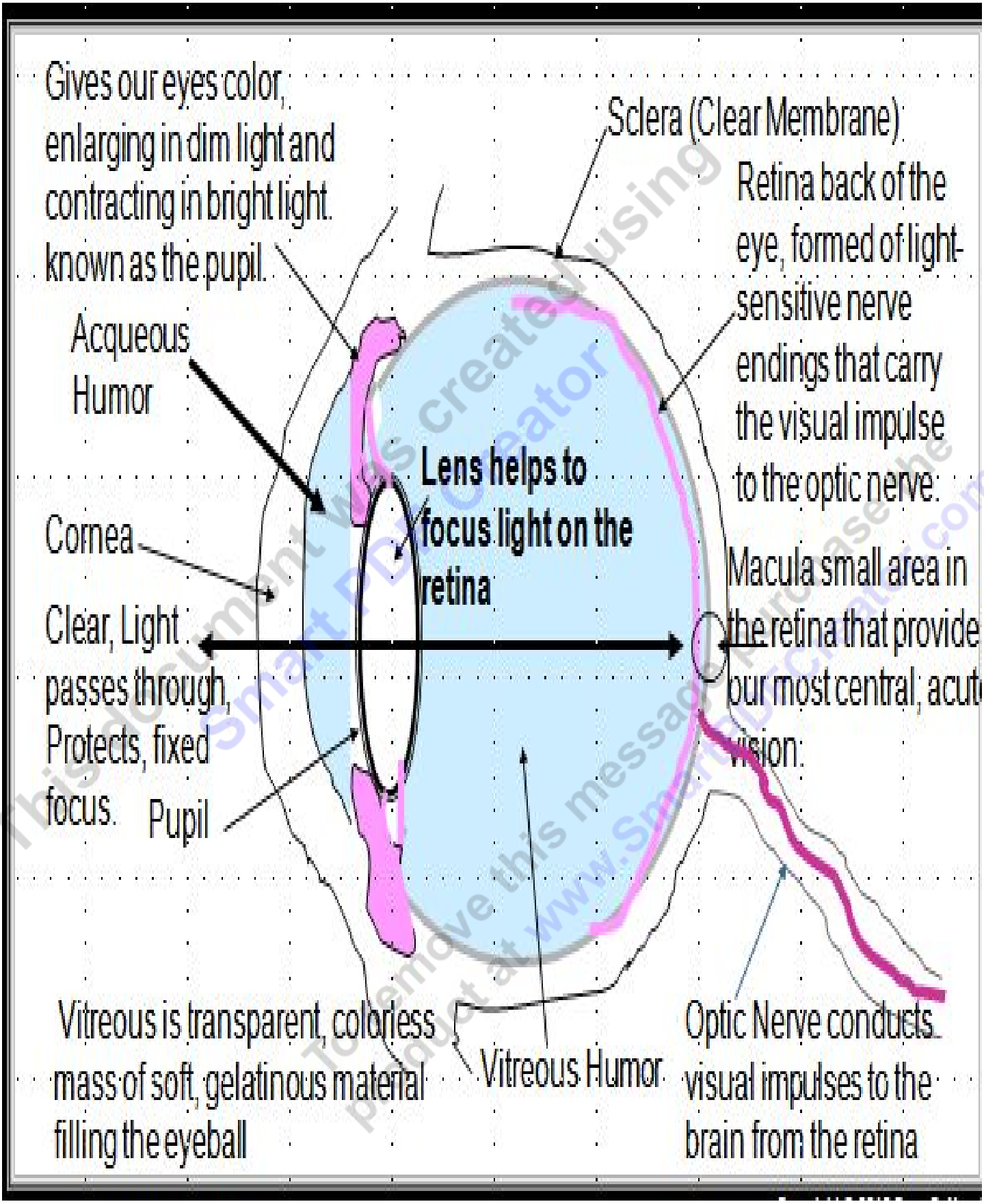


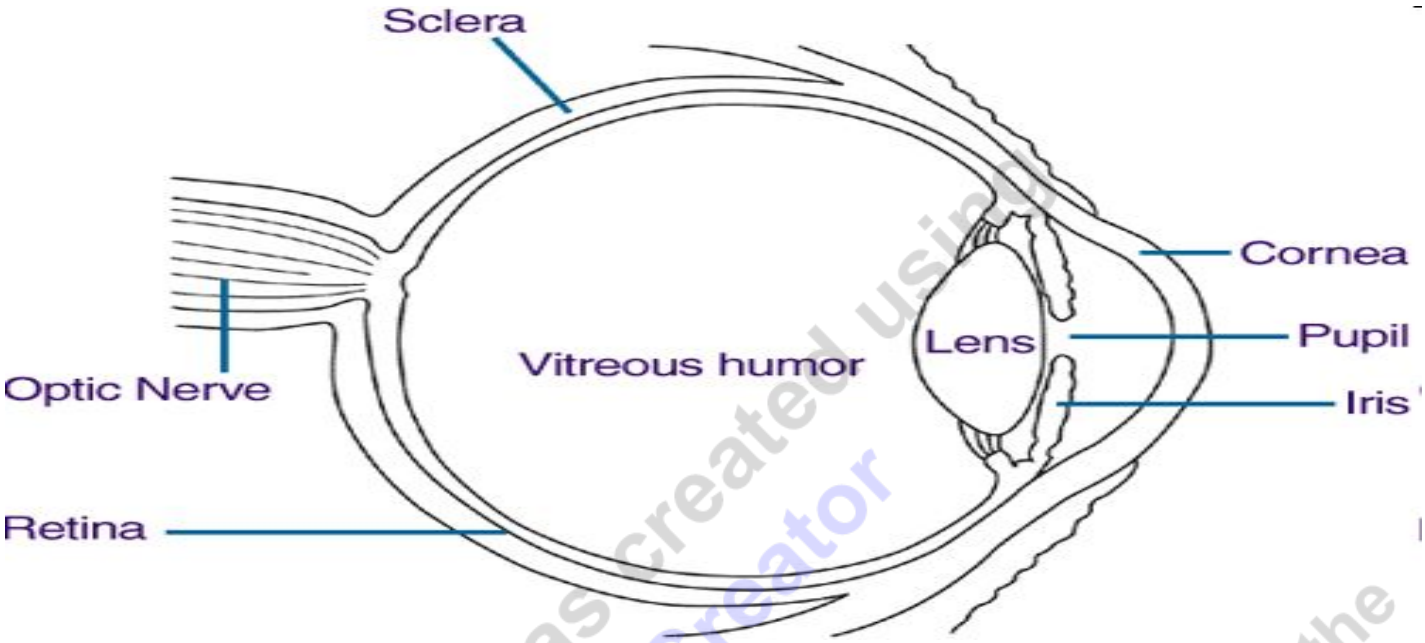
- Cerebrum: Learning, Intelligence, emotions, personality, Judgment, and all voluntary activities of your body.
- Cerebellum: Controls motor movement, coordination, balance.
- Corpus Callosum: Thick band of nerve fibers that divides the cerebrum into left and right hemispheres.
- Medulla connects brain to spinal column and controls all involuntary activities.
- Thalmus: Lobed mass of grey matter buried under the cerebral cortex. It is involved in sensory perception and regulation of motor functions.
    - Also controls sleep and awake consciousness



Frontal Lobe- associated with reasoning, planning, parts of speech, movement, emotions, and problem solving
Parietal Lobe- associated with movement, orientation, recognition, perception of stimuli
Occipital Lobe- associated with visual processing
Temporal Lobe- associated with perception and recognition of auditory stimuli, memory, and speech




Gives our eyes color, enlarging in dim light and contracting in bright light known as the pupil.
Sclera (Clear Membrane)
Retina back of the eye, formed of light-sensitive nerve endings that carry the visual impulse to the optic nerve.
Acqueous Humor
Lens helps to focus light on the retina
Cornea
Clear, Light passes through, Protects, fixed focus.
Macula small area in the retina that provide our most central, acut vision.
Pupil
Vitreous is transparent, colorless mass of soft, gelatinous material filling the eyeball
Vitreous Humor
Optic Nerve conducts visual impulses to the brain from the retina



Rod and Cones: The two types of photoreceptors in the eye.

- Rods are more numerous (120 million) and work well in dim light.
- Cones see color (6-7 million – macula) and don't work well in dim light.
  - That is why you don't really see colors at night.

Smell: To perceive the scent of (something) by means of the olfactory nerves.

To Smell…

- Inside your nose is a patch of neurons that come in contact with the air.
- They have hair like projections called cilia that maximize surface area with air.
- Odor molecules bind to cilia and message is sent via the neurons.

Reminder for homework question – The nose filters particles, warms the air, and moistens the air as well as smells.

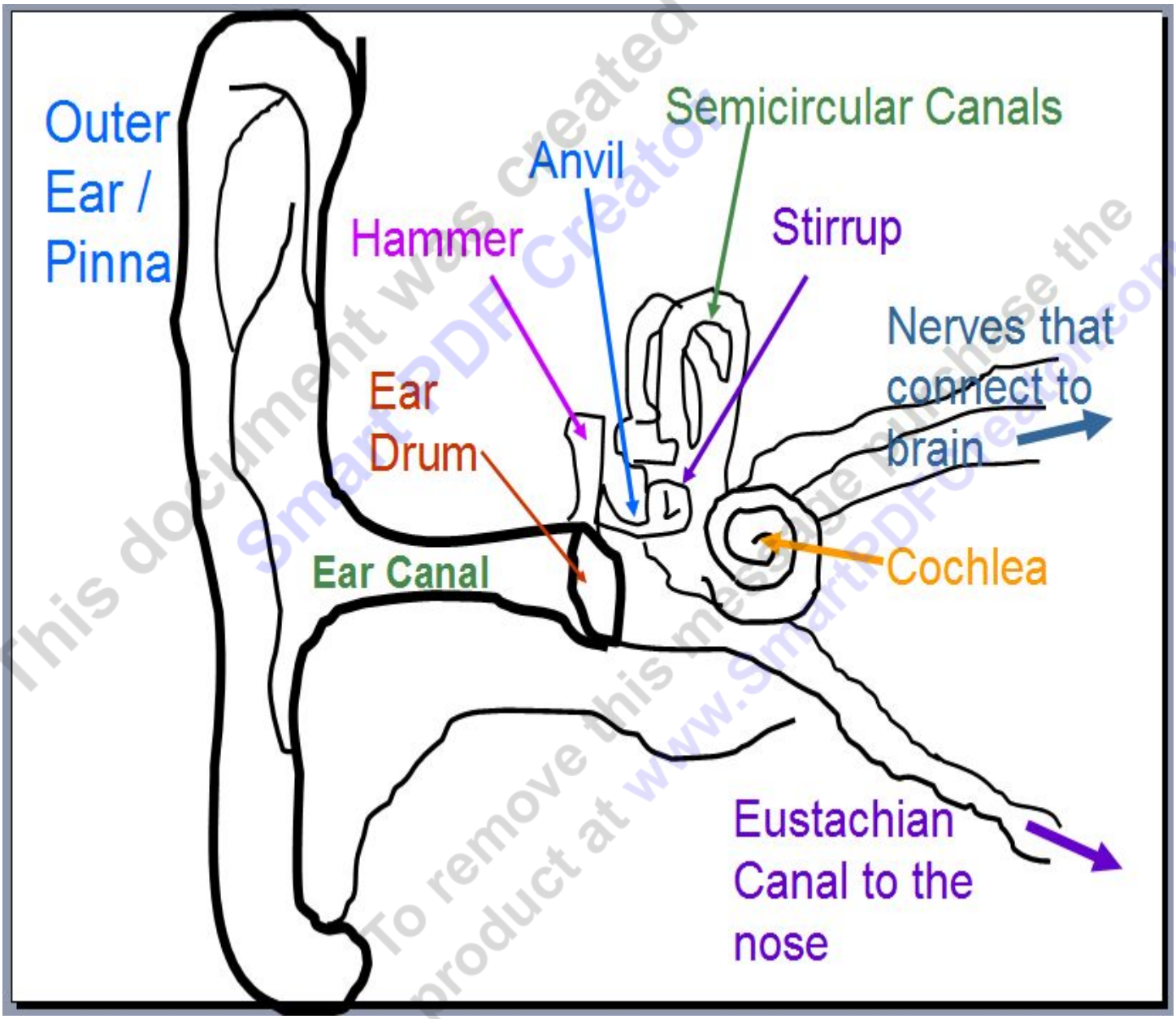
Hearing…

- The hearing system is based solely on physical movement. (Not chemical such as smell and taste).

- Sound occurs when it vibrates in matter. (Solid, Liquid, Gas).

To Hear, you must…

- Direct the sound waves into the hearing part of the ear.
- Sense the fluctuations in air pressure.
- Translate these fluctuations into an electrical signal that your brain can understand.



Anvil - A tiny bone that passes vibrations from the hammer to the stirrup.

Cochlea - A spiral-shaped, fluid-filled inner ear structure; it is lined with cilia (tiny hairs) that move when vibrated and cause a nerve impulse to form.

Eardrum - (Also called the tympanic membrane) a thin membrane that vibrates when sound waves reach it.

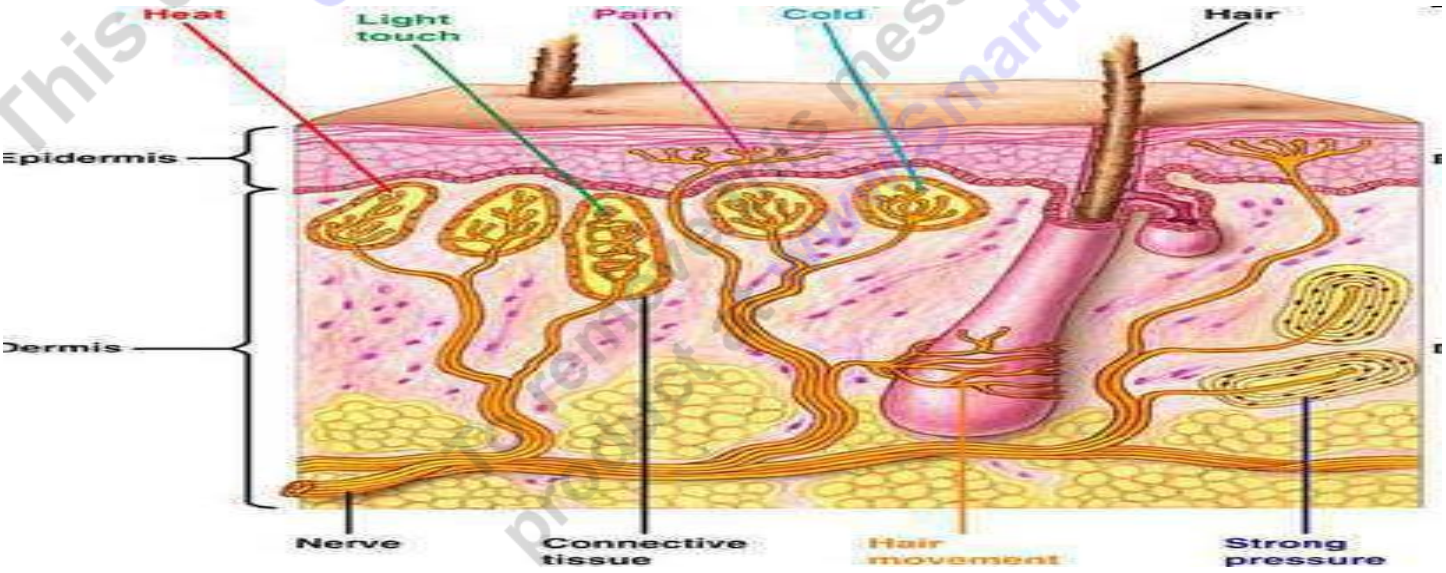
Eustachian Canal - A tube that connects the middle ear to the back of the nose; it equalizes the pressure between the middle ear and the air outside.

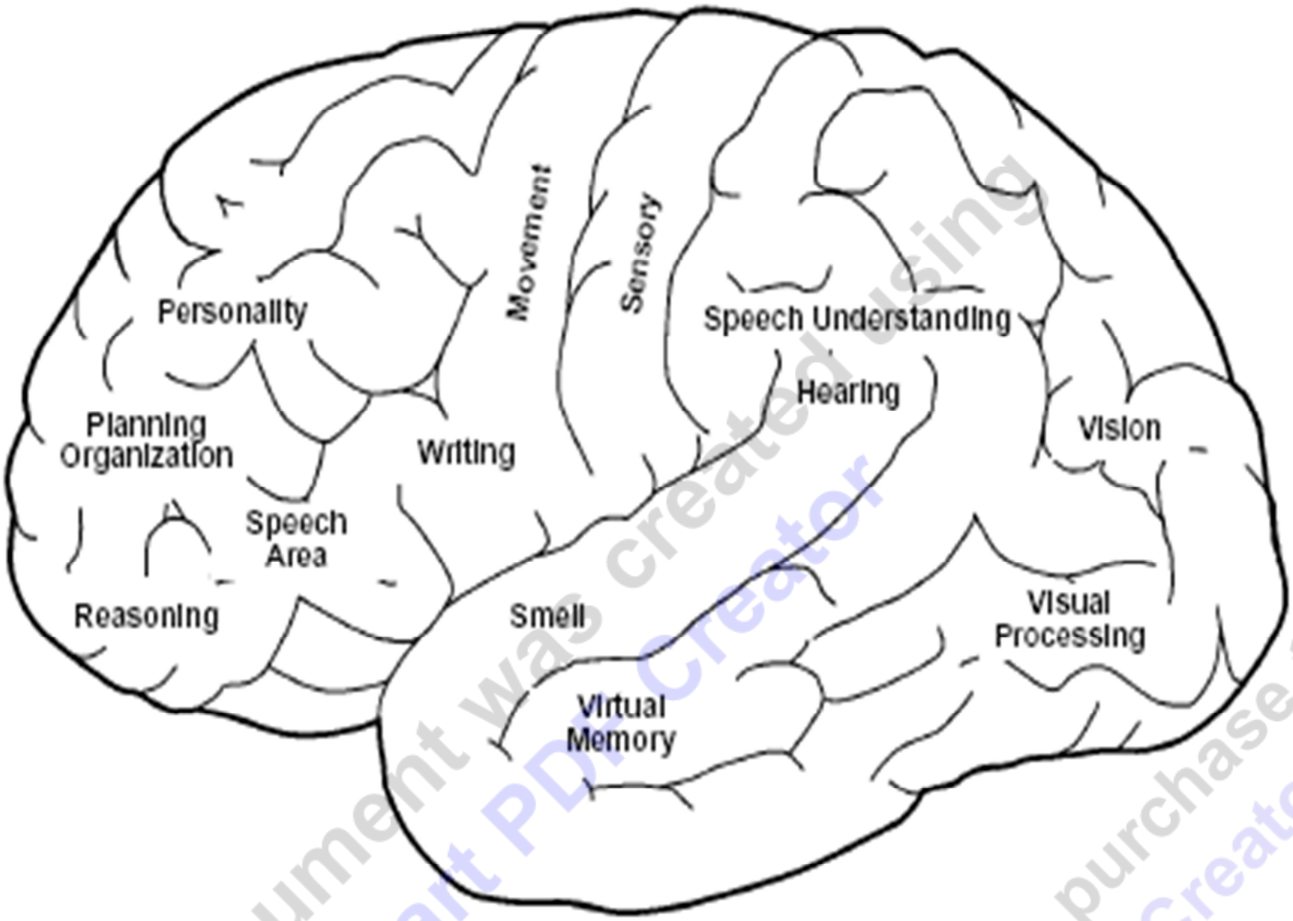
- When your ears pop as you change altitude (going up a mountain or in an airplane), you are equalizing the air pressure in your middle ear.

Hammer - A tiny bone that passes vibrations from the eardrum to the anvil.

The skin has touch receptor cells that allows you to feel texture.

1. Deeper receptor cells allow you to feel pressure.
2. Other receptors respond to heat, cold, and pain.





Part XI: The Endocrine System

The endocrine system is a system of glands that release chemical messages into your body.

Gland: A cell, a group of cells, or an organ that produces a secretion for use elsewhere in the body.

Hormone: A chemical substance produced in the body that controls and regulates the activity of certain cells or organs.

- Some activities in the body…
  - Growth
  - Sexual development
  - Reproductive cycle

- Digestion
- Sleep
- Hair growth
- Hunger
- Blood Production
- Much More

- Some important hormones
  - Insulin
  - Testosterone
  - Estrogen
  - Adrenaline
    - epinephrine
  - Dopamine
  - Melatonin
  - Thyroxine

Nervous and Endocrine both regulate the body.
- Nervous system sends electrochemical signals.
- The endocrine sends chemical messages in blood.

- Exocrine Glands: Give off chemicals through ducts (tubes) to organs.
  - These don't produce hormones
  - Produce tears, sweat, oil, digestive juices, saliva,

- Pituitary Gland: Communicates to hypothalamus (neurons). Size of pea.
  - Controls blood pressure, growth, metabolism

- Thymus: Responsible for development of immune system.

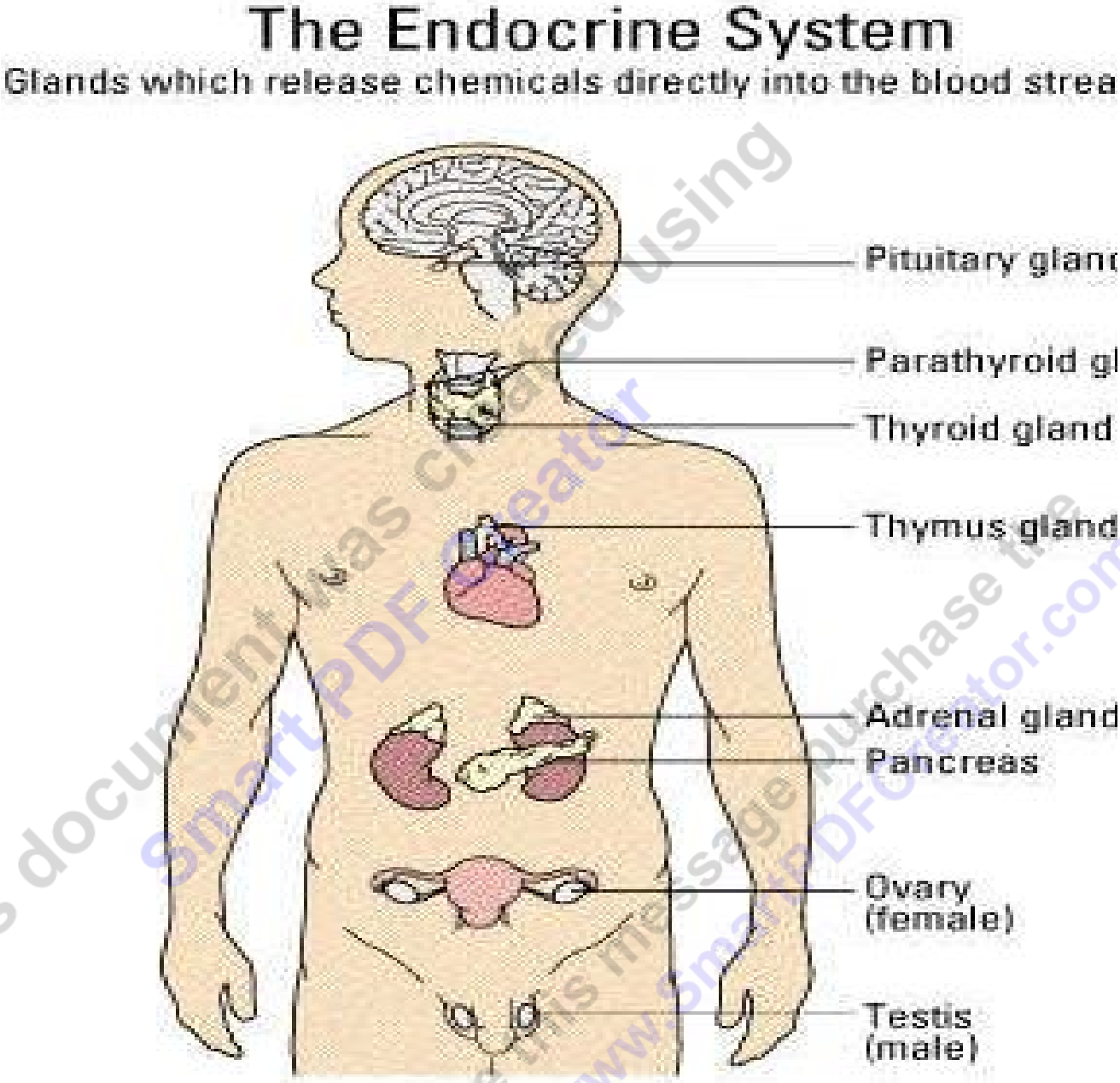
- Thyroid: Controls how quickly the body uses energy, makes proteins, and controls how sensitive the body should be to other hormones.

- Adrenals: Produces adrenaline, part of emergency action plan, puts you on high alert.

- Pancreas: Produces insulin, which keeps sugar (glucose) in blood under control.
  - Helps body absorb sugar and use it for energy.
  - Turns excess sugar into a storage molecule called glycogen.
    - Diabetes: Levels of sugar in ones blood is too high.

- Ovaries and testes: Produce sex hormones.
  - Male: Testosterone
  - Female: Estrogen

- Body Stability: The presence of an abnormally large amount of any hormone or other substance will trigger a gland to secrete a counterbalance hormone.
  - This keeps your body in chemical balance.



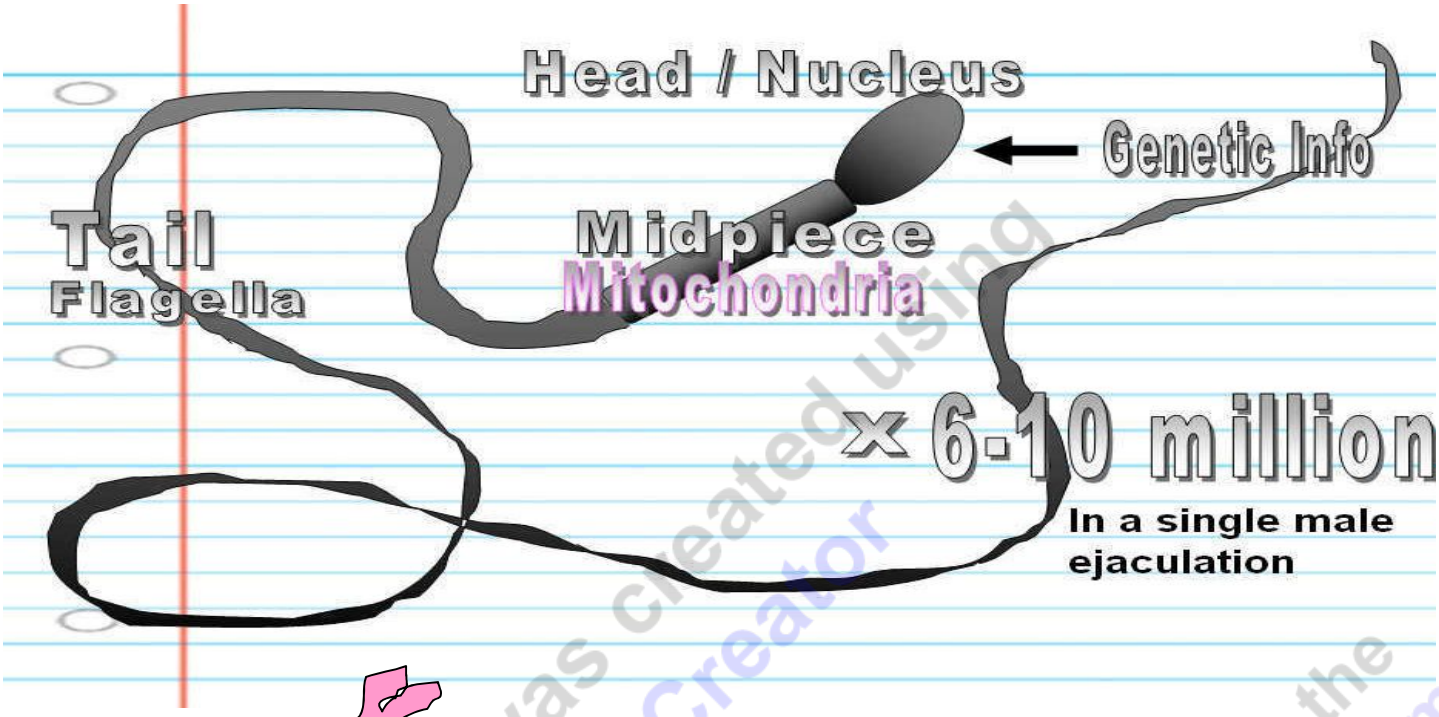
Part XII: The Reproductive System

The Reproductive System: Produces, stores, nourishes and releases sex cells.

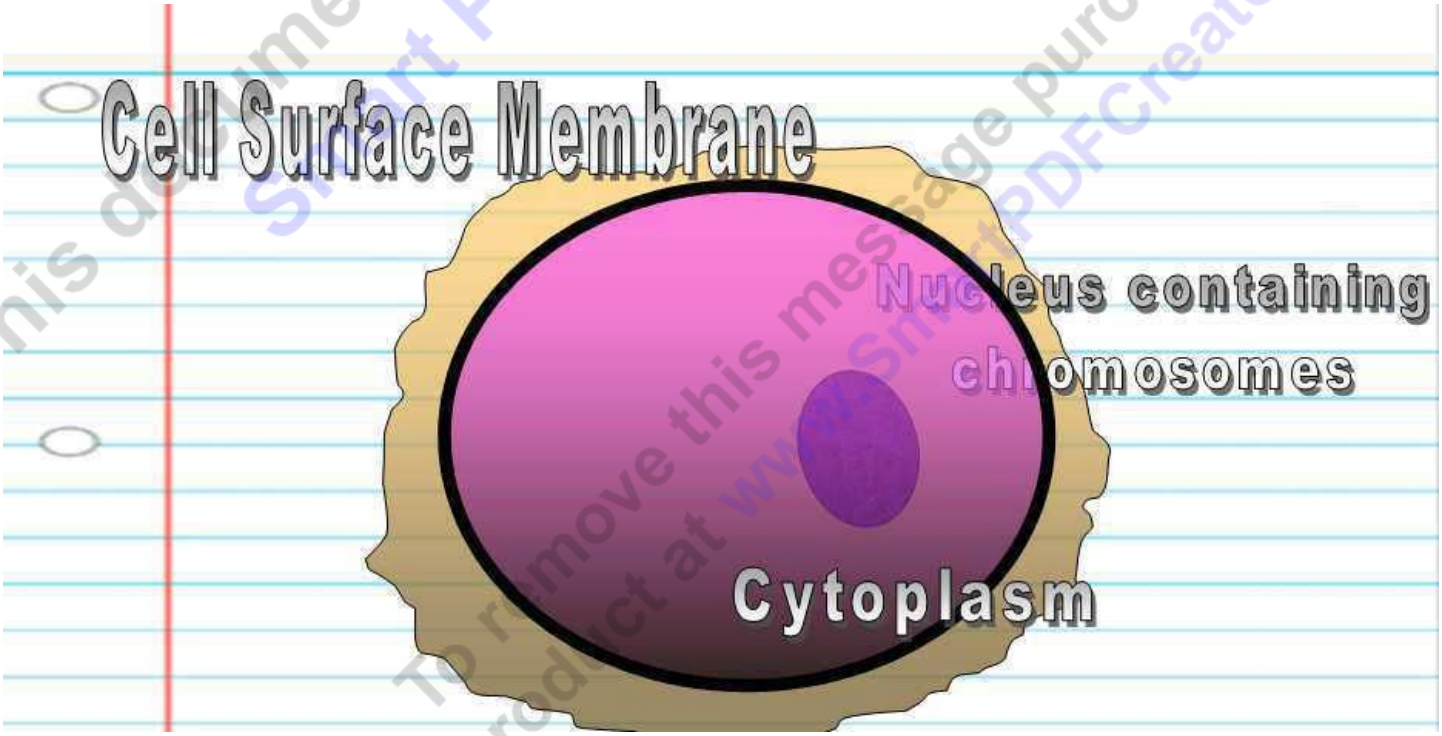
Sperm: Male sex cell (gamete)

Fertilization: The joining of the egg and the sperm.

- The sperm and egg contain genetic information that will allow this one cell to multiply into trillions.

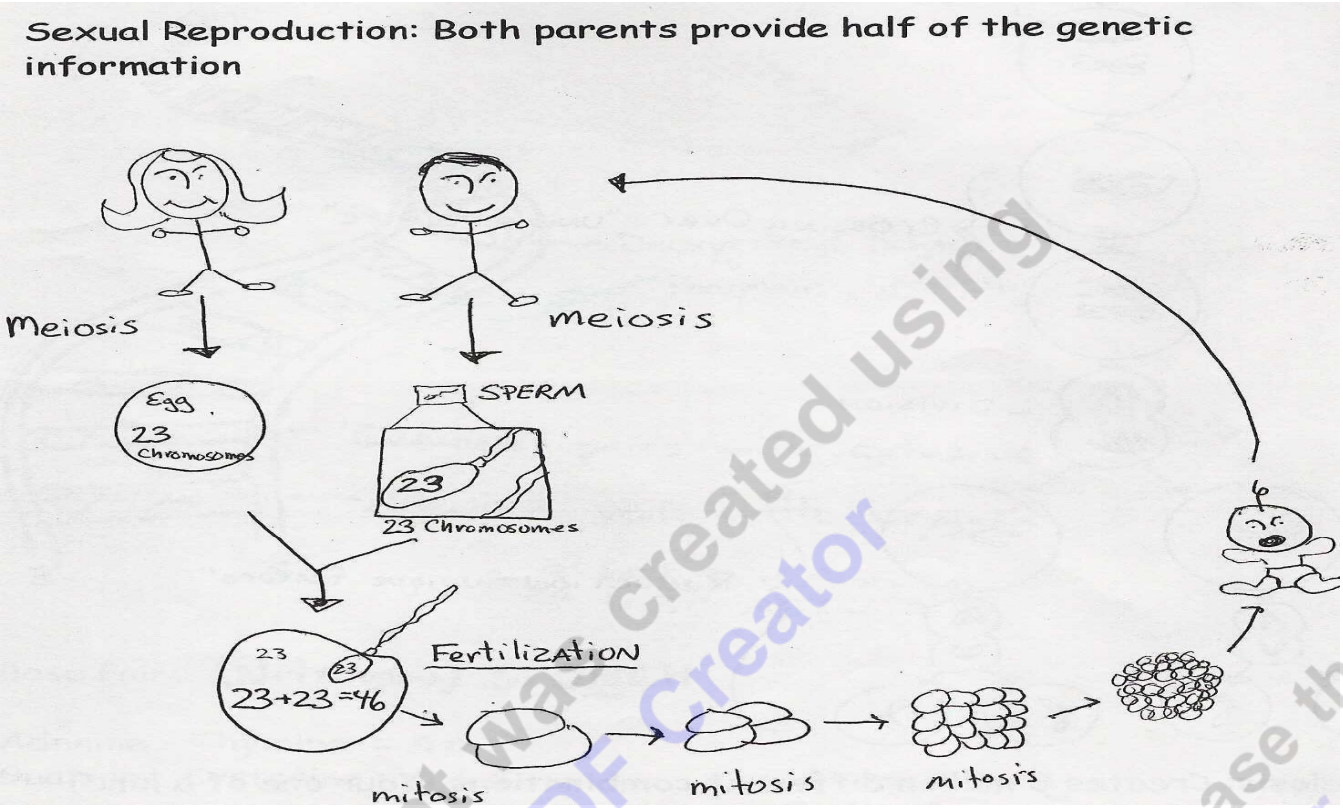


Chromosome: An organized structure of DNA and protein that is found in cells.



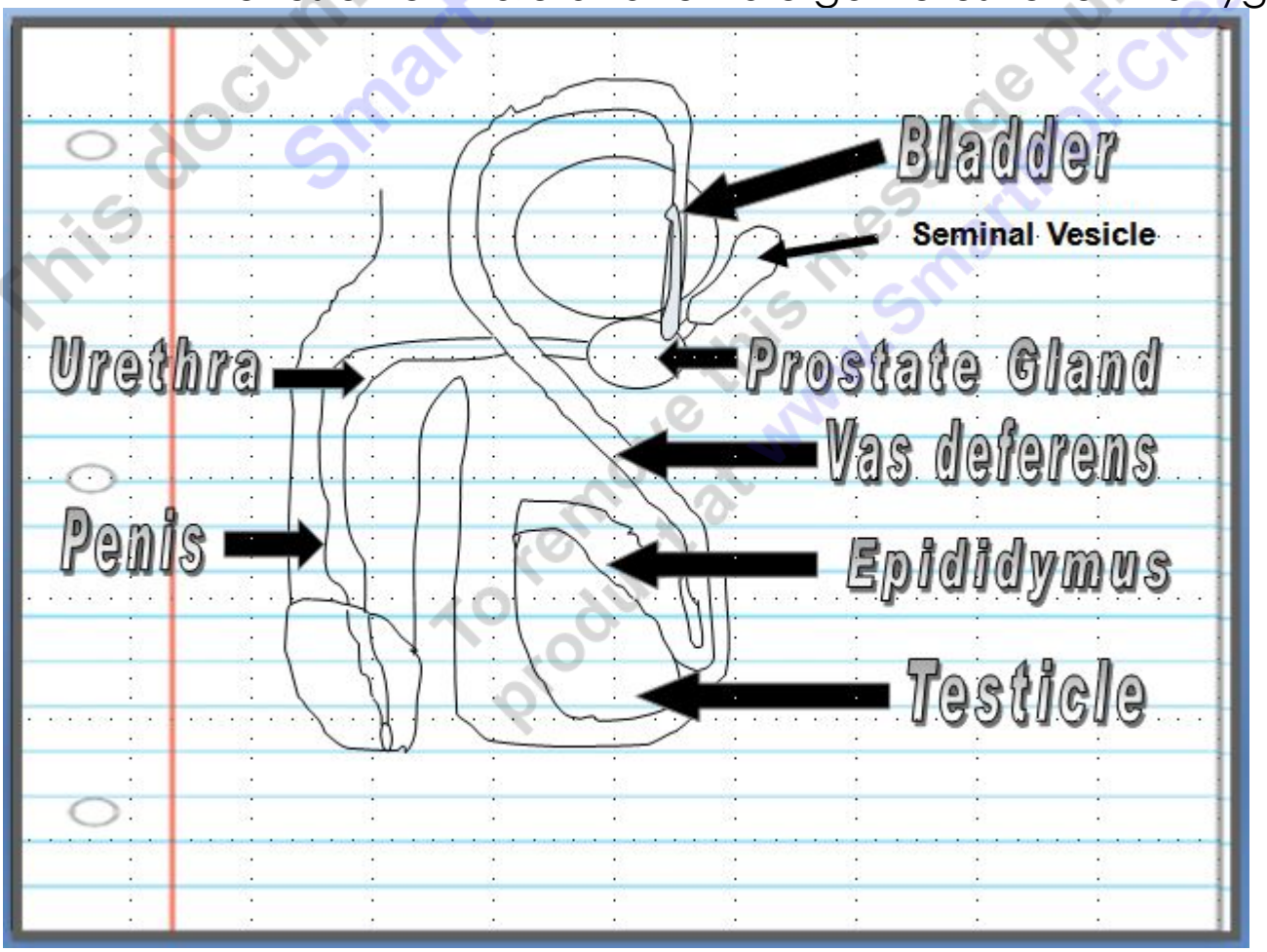
The Egg: a haploid female reproductive cell or gamete.

- Much larger than the sperm
- At birth, there are approximately 1 million eggs; and by the time of puberty, only about 300,000 remain



Fertilization: The process of fertilizing an egg.

- The fusion of male and female gametes to form a zygote.



Vas Deferens: The tube connecting the testes with the urethra.
Seminal Vesicle: Small tubular glands that are near the prostate. The primary function involves the production of fluid that makes up a significant percentage of semen.

Penis: This is the duct for the transfer of sperm during copulation.
Testicles: This is either of the two oval organs that produce sperm in men.

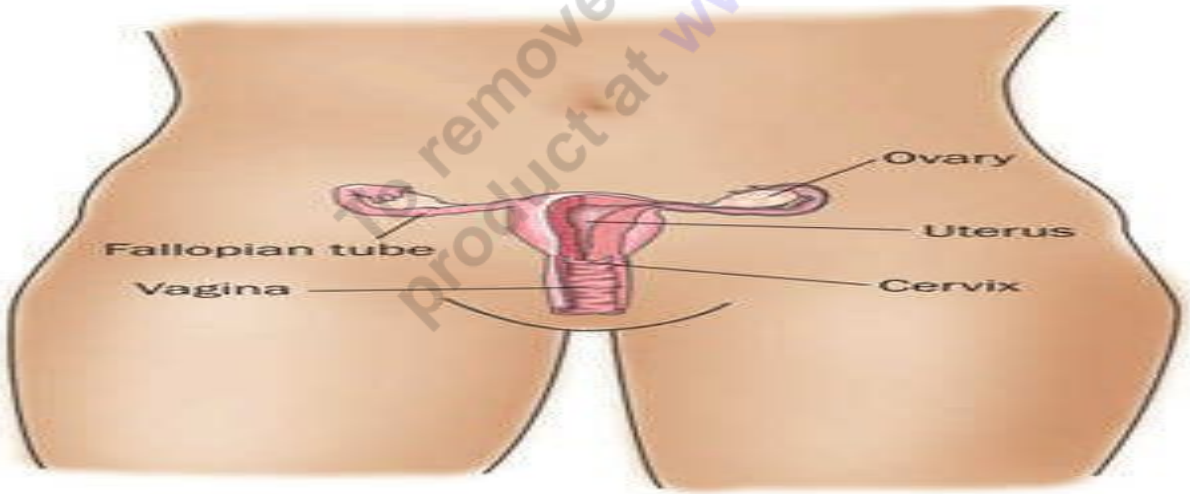
Urethra: This is the duct by which urine is conveyed out of the body from the bladder

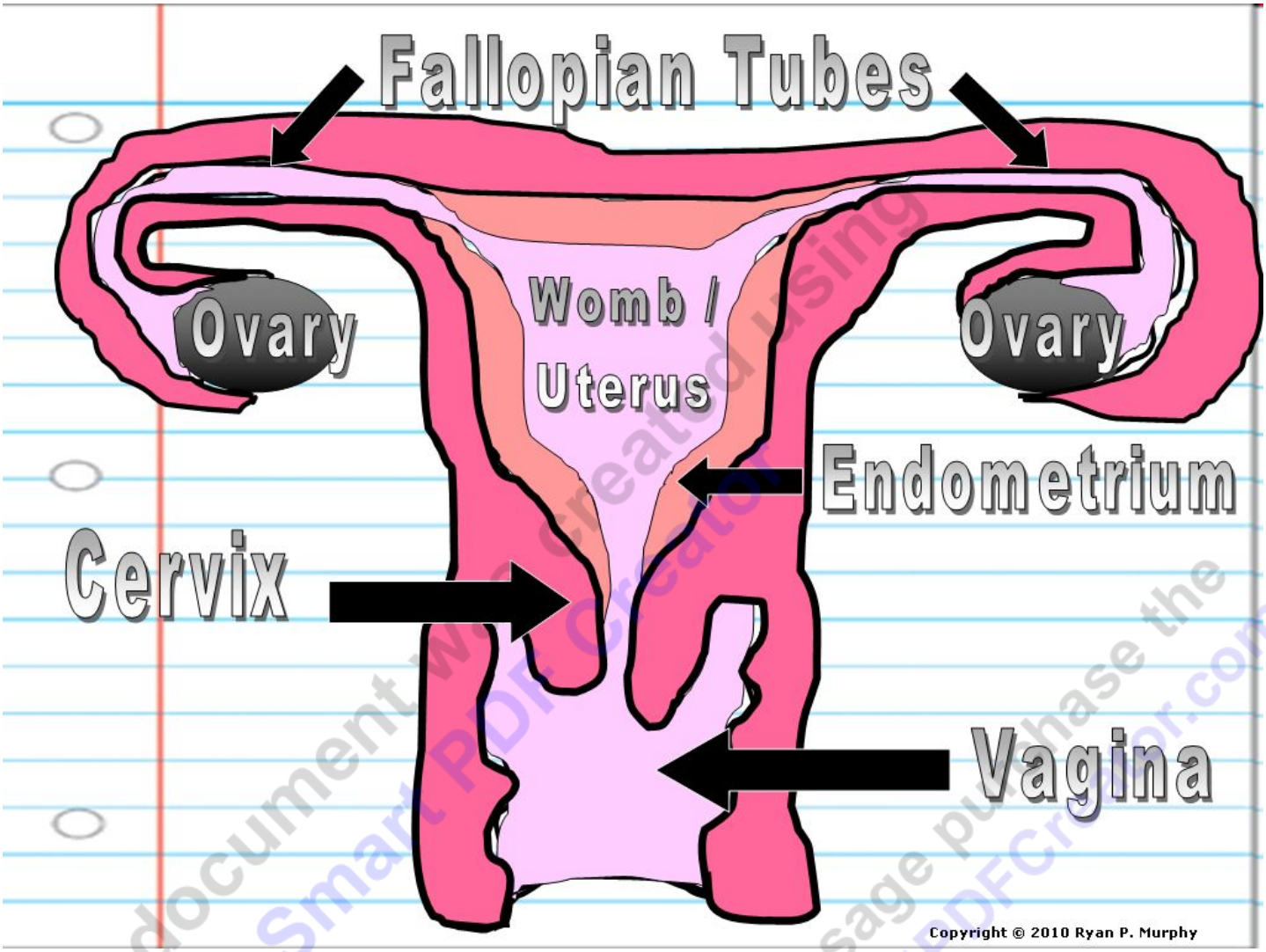
Prostate Gland: This is a firm partly muscular chestnut sized gland in males at the neck of the urethra; produces a viscid secretion that is the fluid part of semen.

Bladder: A membranous sac in humans and other animals, in which urine is collected for excretion.

Epididymus: This is a highly convoluted duct behind the testis, along which sperm passes to the vas deferens.

Female Reproductive System: The primary female reproductive organs are the ovaries.





Cervix: Located between the vagina and uterus, it serves as a passageway for menstrual blood on the way out, and semen on the way in. (During childbirth, the cervix slowly thins and opens, allowing the baby to move from the uterus and into the vaginal canal.)

Ovary: A female reproductive organ in which ova or eggs are produced.

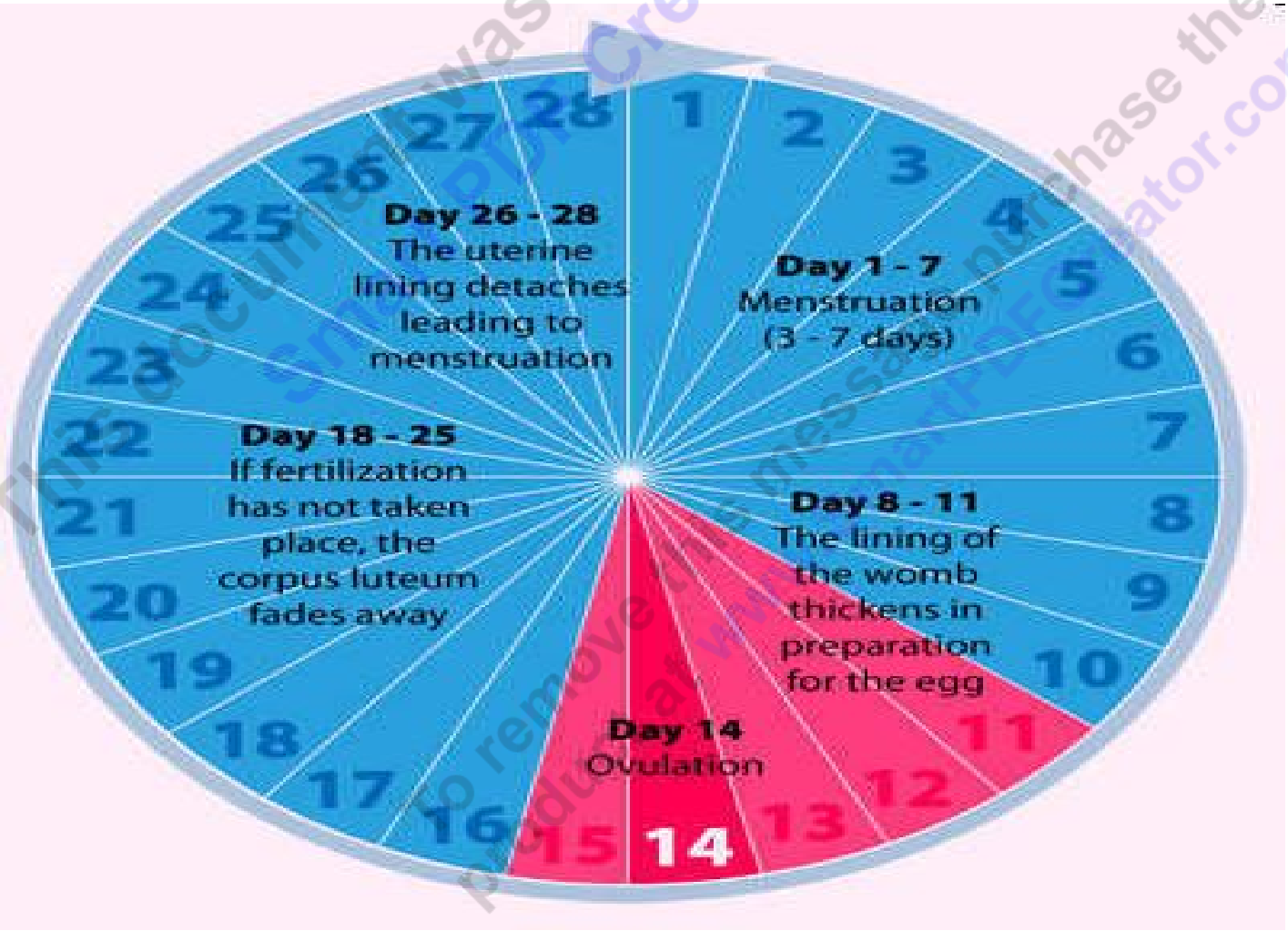
Uterus / Womb: This is a muscular organ, containing and nourishing the young prior to birth.

Fallopian Tube: These transport the egg from the ovary to the uterus (the womb).

Vagina: Muscular tube leading from the external genitals to the cervix of the uterus.

Endometrium: This is the mucous membrane lining the uterus, which thickens during the menstrual cycle in preparation for possible implantation of an embryo.

The Menstrual Cycle: A series of changes a woman's body goes through to prepare for a pregnancy.



The Placenta: Organ that connects the developing fetus to the uterine wall.

- Allows nutrient uptake

- Eliminates waste
- Gas exchange via the mother's blood supply.

The growing fetus gets all of its nutrients directly from it's mother blood supply.

- Smoking, drinking alcohol, and exposing the baby to any dangerous drugs can have severe consequences to the developing fetus.

Part XIII: The Immune System

Infectious Diseases will include

- Viruses
- Bacteria
- Parasites

A virus a nucleic acid (DNA or RNA) enclosed in a protein shell or coat.

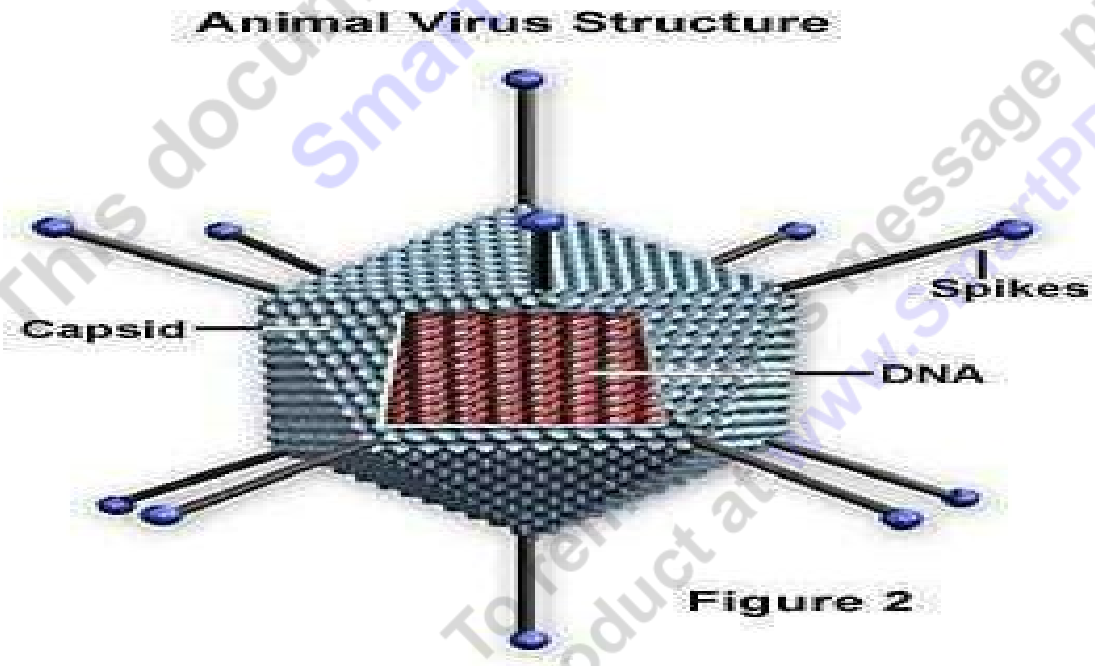
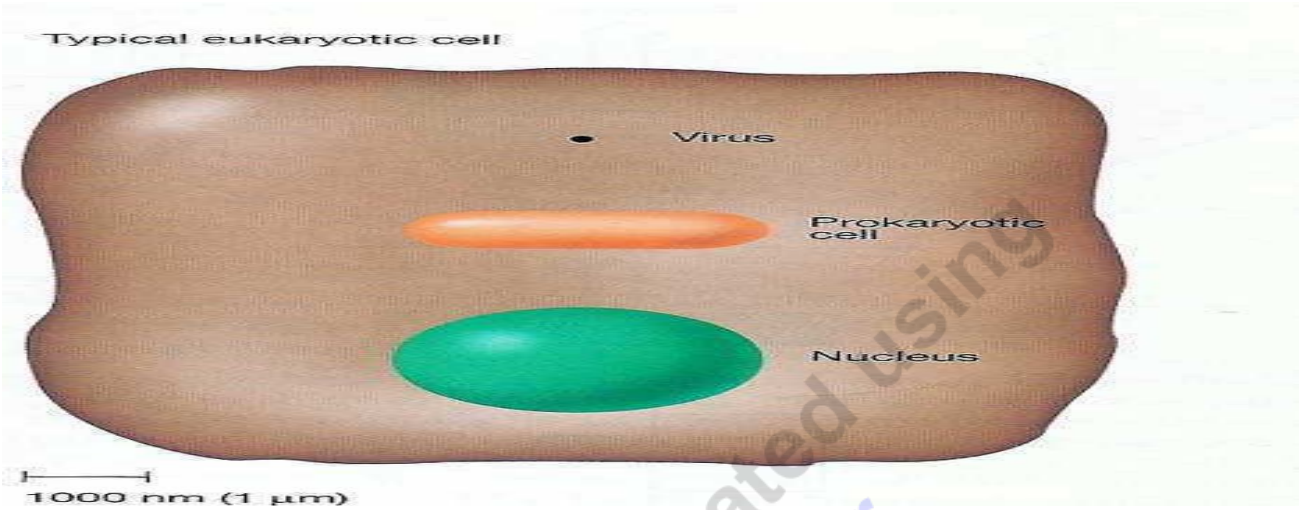


Figure 2

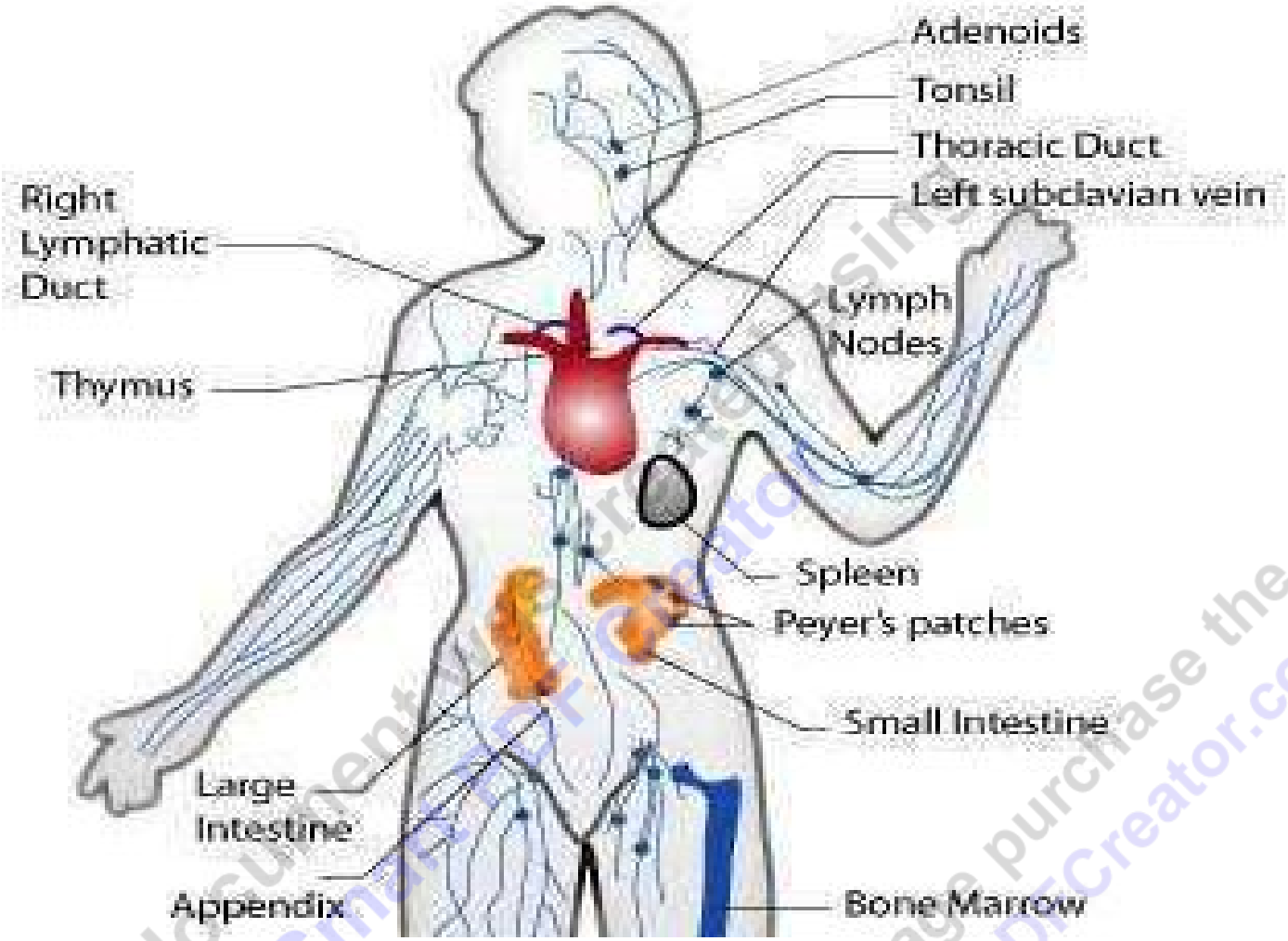
Viruses are extremely small, approximately 15 - 25 nanometers in diameter

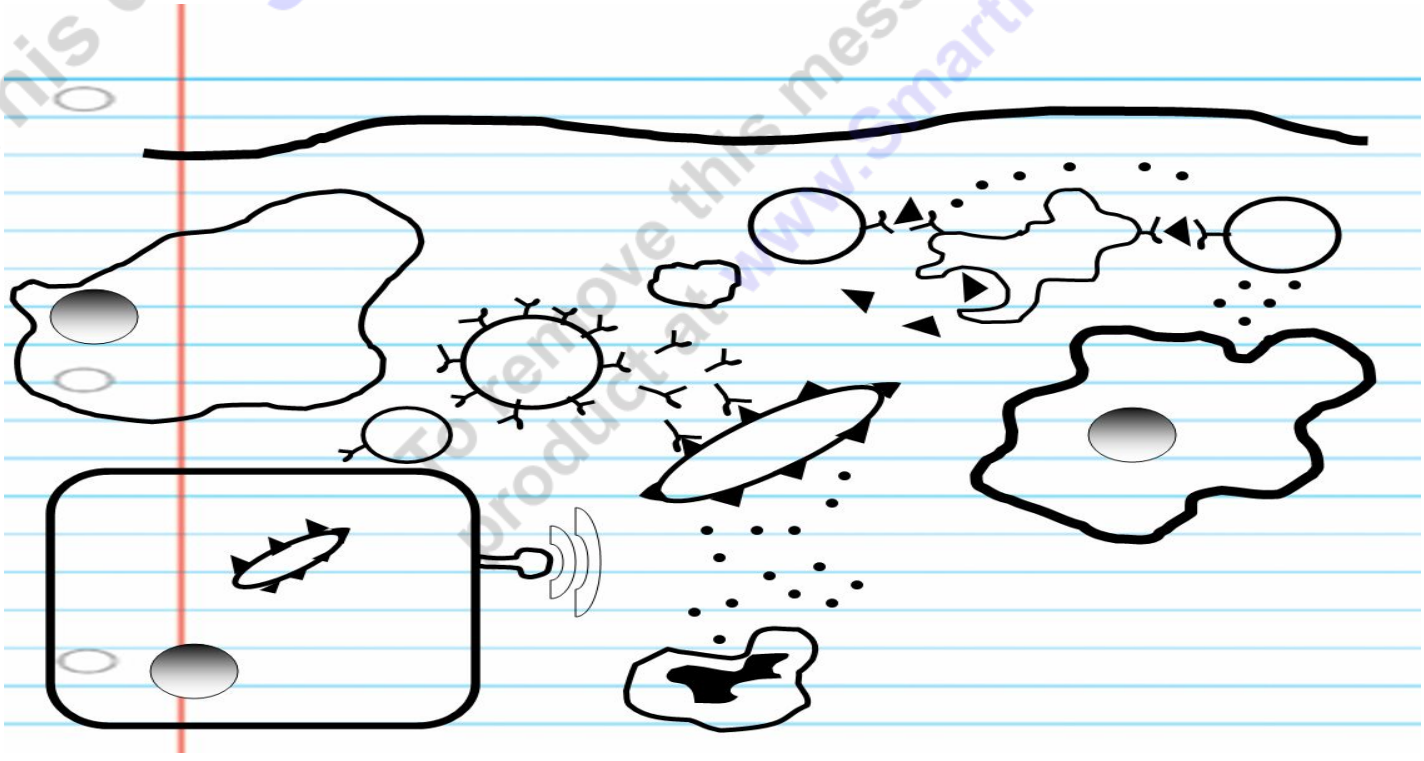


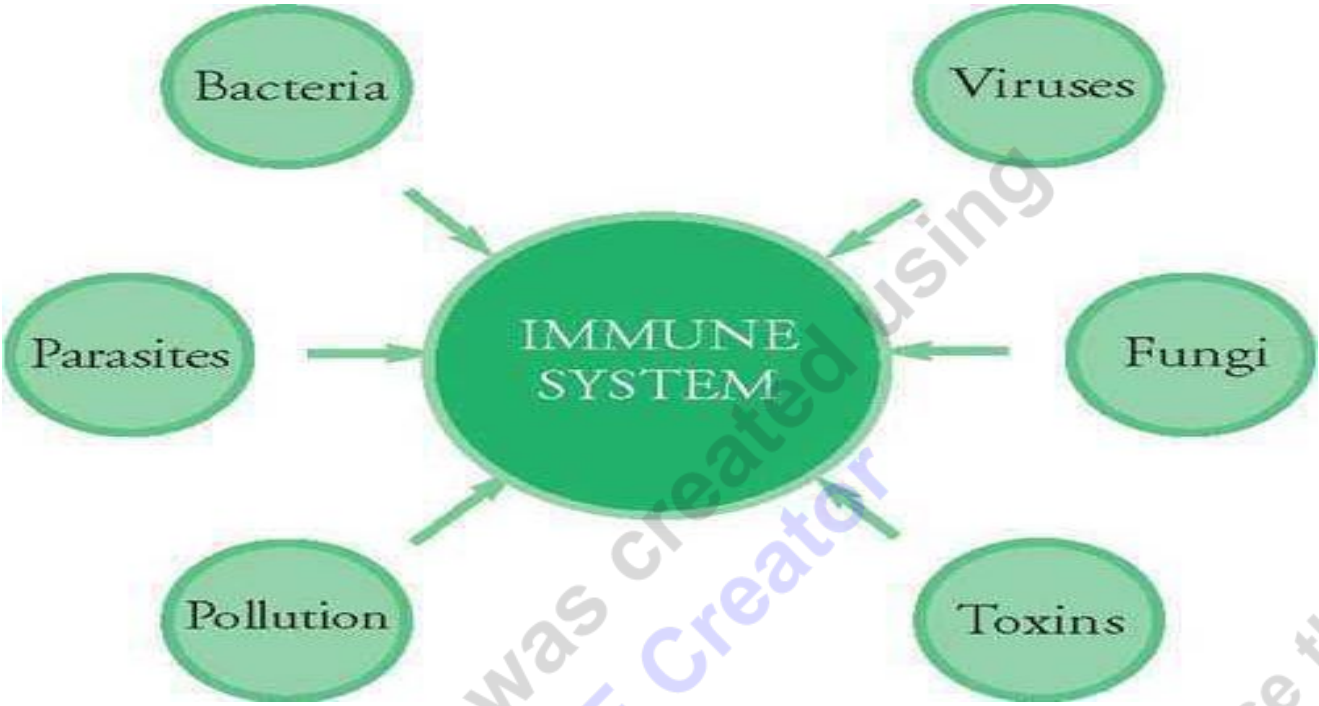
They can reproduce only by invading and taking over other cells as they lack the cellular machinery for self reproduction.

Diseases can be spread by…

- Insects
- Air
- Water
- Food
- Person to Person
- Animal to Person







1st Line of Defense

Skin prevents disease from entering body

Interleukins – Tell body it's under attack

2nd Line of Defense

The inflammatory response: Damaged cells release chemicals.

- These chemicals cause blood vessels to leak fluid into the tissues, causing swelling.
- This helps isolate the foreign substance from further contact with body tissues.

3rd Line of Defense

Interleukins: These tell the body it's under attack.

- These give you the aches and pains. "Time to rest!" (Warning System)

Leukocytes: White blood cells (made in bone marrow)

- - Phagocytes: Cells that engulf invaders.
- - Lymphocytes: Cells that remember the invaders and help the body destroy them if they come back.
  - B-Cells
  - T-Cells

Dendritic Cells: These cells function to obtain antigen in tissues, they then migrate to lymphoid organs and activate T cells.

- Antibodies cling to virus making it difficult to attach to cell.

Immunity: Your immune system is now familiar with the invaders and can summon antibodies quickly.

Vaccine: A suspension of weakened or dead pathogenic cells are injected in order to stimulate the production of antibodies and boost immunity.

Virus prevention

- Minimize contact with reservoir animal (birds, mice, etc.)
- Minimize person to person contact.

HIV=Human Immunodeficiency Virus

- The virus attacks the cells of our immune system.
- This makes the host susceptible to disease.

Please record the ways in which you can be infected with HIV as a class.

Unprotected sexual intercourse with an infected person.

- That is all types of sex, where bodily fluid is released for either gender.

- Contact with an infected person's blood

- From mother to child (Breastmilk)

-Use of infected blood-Most blood banks are tested but always a risk

- Injecting drugs (needles are often shared between users)

AIDS -Acquired Immune Deficiency Syndrome

The disease AIDS occurs when the immune system cells left in the body drop below a particular point.

STD's - The types of sexual activity that can transmit a disease are

- penetrative sex (vaginal, anal or oral)
- genital foreplay.

Some diseases are transmitted through -

- skin to skin contact
- Fluids such as sperm, blood or saliva
- some are passed from mother to baby

Review! Abstinence is best, (Means no contact!) if you can't abstain, than use a condom. Condom use doesn't prevent the skin to skin, and only helps against the others.

GREAT WORK!
HOLD ON TO THESE NOTES FOR THE BUNDLED HOMEWORK PACKAGE!
DO NOT LOSE!
PUT IN YOUR BINDER!