GenBio - 1ST GRADING Cheat Sheet

by April Magsino (4relmsn) via cheatography.com/166795/cs/34917/

CELL HISTORY

Cell	basic and smallest unit of life
Robert Hooke	discovered cell through a microscope in 1665
Matthias Jakob Schleiden & Theodor Schwann	developed the cell theory in 1839

CELL

Parts of a Cell	Function
nucleus	- control center of cell
cell membrane	- outer layer and protection of the cell
nucleolus	- in the nucleus and contains genetic info (RNA)
nucleoplasm	- liquid inside nucleus (DNA)
cytoplasm	- liquid that fills the inside of the cell
golgi bodies	- protein package
mitochondria	- powerhouse of the cell
ribosome	- RNA carrier
lysosome	- killing cells
chromosome	- DNA carrier
endoplasmic reticulum	- passageway

DNA - deocyribonucleic acid
RNA - ribonucleic acid
Necrosis - death of a cell or a body tissue

MITOSIS

PHASES	
1. Interphase	a complete cell
2. Prophase	chromosome pairing occurs
3. Metaphase	division of cell
4. Anaphase	in position of cleavage furrow
5. Telophase	two complete cells with identical genomes

Mitosis is the process, in the cell cycle, by which the chromosomes in the cell nucleus are separated into two identical sets of chromosomes, each in its own nucleus.

Cleavage furrow is the indentation of the cell's surface that begins the progression of cleavage, by which animal and some algal cells undergo cytokinesis, the final splitting of the membrane, in the process of cell division.

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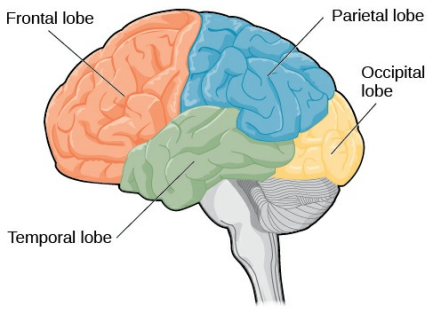
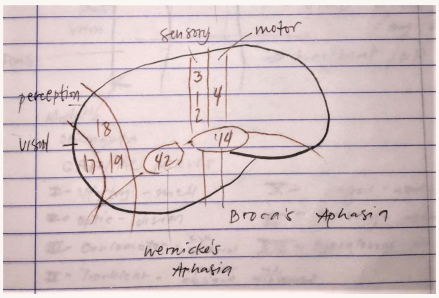
BRAIN



LOBES OF THE BRAIN

frontal lobe	is located in the forward part of the brain, extending back to a fissure known as the central sulcus. The frontal lobe is involved in reasoning, motor control, emotion, and language.
parietal sensory	is located immediately behind the frontal lobe, and is involved in processing information from the body's senses.
temporal lobe	is located on the side of the head, and is associated with hearing, memory, emotion, and some aspects of language.
occipital lobe	is located at the very back of the brain, and contains the primary visual cortex, which is responsible for interpreting incoming visual information.

BRODMANN's AREAs OF THE BRAIN



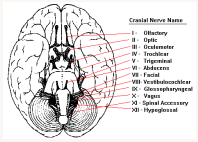
AREAS

Areas 3, 1 & 2	Primary Somatosensory Cortex (frequently referred to as Areas 3, 1, 2 by convention)
Area 4	Primary Motor Cortex
Area 17	Visual / Primary visual cortex (V1)
Area 18	Perception / Secondary visual cortex (V2)
Areas 41 and 42	Wernicke's Aphasia / Auditory cortex

AREAS (cont)

Area 44	Broca's Aphasia / Pars opercularis, part of the inferior frontal gyrus and part of Broca's area

CRANIAL NERVES



The cranial nerves are 12 pairs of nerves that can be seen on the ventral (bottom) surface of the brain. Some of these nerves bring information from the sense organs to the brain; other cranial nerves control muscles; other cranial nerves are connected to glands or internal organs such as the heart and lungs.

LAMINA

I - Olfactory Nerve	Smell
II - Optic Nerve	Vision
III - Oculomotor Nerve	Eye movement; pupil constriction
IV - Trochlear Nerve	Eye movement
V - Trigeminal Nerve	Somatosensory information (touch, pain) from the face and head; muscles for chewing.
VI - Abducens Nerve	Lateral Rectus
VII - Facial Nerve	Taste (anterior 2/3 of tongue); somatosensory information from ear; controls muscles used in facial expression.
VIII - Vestibulocochlear Nerve	Hearing; balance
IX - Glossopharyngeal Nerve	Taste (posterior 1/3 of tongue); Somatosensory information from tongue, tonsil, pharynx; controls some muscles used in swallowing.
X - Vagus Nerve	Sensory, motor and autonomic functions of viscera (glands, digestion, heart rate)
XI - Spinal Accessory Nerve	Controls muscles used in head movement.
XII - Hypoglossal Nerve	Controls muscles of tongue

BRAINSTEM

The brainstem (middle of brain) connects the cerebrum with the spinal cord. The brainstem includes the midbrain, the pons and the medulla.

PARTS OF A BRAINSTEM

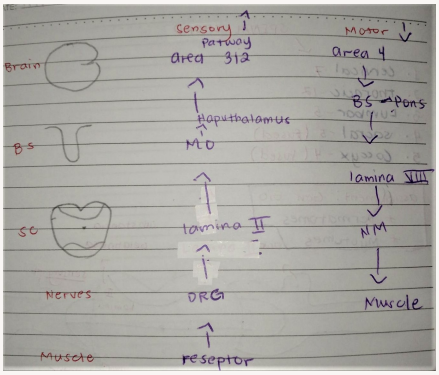
Midbrain	facilitate various functions, from hearing and movement to calculating responses and environmental changes.
Pons	enable a range of activities such as tear production, chewing, blinking, focusing vision, balance, hearing and facial expression.
Medulla Oblongata	the medulla regulate many bodily activities, including heart rhythm, breathing, blood flow, and oxygen and carbon dioxide levels. the medulla produces reflexive activities such as sneezing, vomiting, coughing and swallowing.

SPINAL CORD

Main Parts of Spine

Cervical Spine - Neck
Thoracic Spine - Mid Back
Lumbar Spine - Low Back
Sacral / Sacrum
Coccyx

SENSORY PATHWAY

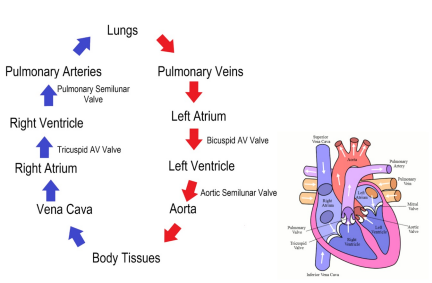


DIGESTIVE SYSTEM

Mouth	Mechanical is breaking foods into pieces such as chewing, squeezing, and mixing. Chemical is where digestive juices, such as stomach acid, bile, and enzymes are involved.
Esophagus	After you swallow, peristalsis pushes the food down your esophagus into your stomach.
Stomach	After food enters your stomach, the stomach muscles mix the food and liquid with digestive juices. The stomach slowly empties its contents, called chyme, into your small intestine.
Small intestine	The muscles of the small intestine mix food with digestive juices from the pancreas, liver, and intestine, and push the mixture forward for further digestion. The walls of the small intestine absorb water and the digested nutrients into your bloodstream.
Large Intestine	Waste products from the digestive process include undigested parts of food, fluid, and older cells from the lining of your GI tract. The large intestine absorbs water and changes the waste from liquid into stool.
Rectum and Anus	The lower end of your large intestine, the rectum, stores stool until it pushes stool out of your anus during a bowel movement.

Peristalsis is a series of wave-like muscle contractions that move food through the digestive tract. It starts in the esophagus where strong wave-like motions of the smooth muscle move balls of swallowed food to the stomach.

PULMONARY CIRCULATION



PLANT DEVELOPMENT

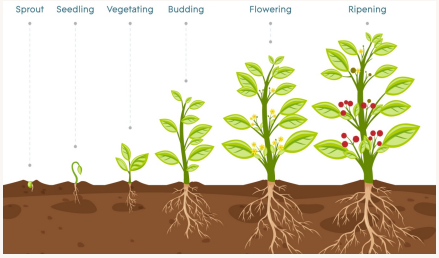
Is a continuous process starting with embryogenesis and the formation of the primary plant body (embryonic root and embryonic shoot) and continuing post germination with the regular production of new organs (roots, leaves, branches, and flowers).

Plant Growth - increasing of plant volume or mass without formation or new structures (e.g. organs, tissues, cells, etc.)

LIFE CYCLE OF A SUNFLOWER

PHASES	
Seeds	the seeds are planted in the ground or they fall from the seed head and settle
Germination	hard shell softens and splits, roots grow downwards and shoots grow upwards
Seedling	after about a week, leaves start to grow and then so on
Young Plant	buds form and unfolds into petals
Adult Plant	flower blooms
Seeds Fall	the dead plant's seeds dries up and the cycle repeats

LIFE CYCLE OF A TOMATO



PARTS OF A SEED

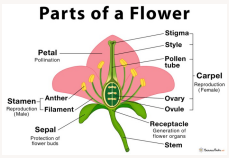
Epicotyl	region of an embryo or seedling stem
Radicle	develops into the primary root
Testa	the seed coat / protective layer
Cotyledon	an embryonic leaf in seed-bearing plants
Micropyle	a small opening in the surface of an ovule

PLANT REPRODUCTION

Sexual Reproduction	requires genetic material from two parents / combination of gametes for fertilization to produce offspring
	flowering plants reproduce through **pollination** / can either self-pollinate or cross-pollinate
Asexual Reproduction	requires DNA from one parent / identical offspring are called clones
	two methods are **vegetation propagation** and **fragmentation**

Cross-pollination happens when the wind or animals move pollen from one plant to fertilize the ovules on a different plant. The advantage of cross-pollination is that it promotes genetic diversity. Some plants have features that **prevent self-pollination**, such as pollen and ovules that develop at different times.

FLOWER STRUCTURE



The flowers contain male sex organs called **stamens** and female sex organs called **pistils**. The **anther** is the part of the stamen that contains pollen. This pollen needs to be moved to a part of the pistil called the **stigma**.

ANIMAL DEVELOPMENT

Cleaving	fertilized egg undergoes mitosis or cell multiplication / forms *Morula*, a ball consists of clustered cells / forms a *Blastula* — hollow cell sphere of blastomeres.
Gastrulation	an early multicellular embryo composed of germinal layers, that subsequently formed after the blastula
	Germinal Layers : Ectoderm, Endoderm, Mesoderm
Organo-genesis	starts at the end of the process of gastrulation / the formation of organs and organ systems that continues until birth
	Ectoderm: Nervous System - Eye Lenses - Mouth (Including Teeth) - Sense Organs - Skin
	Mesoderm: Circulatory System - Bone Marrow - Bone - Sex Organs - Body Cavity
	Endoderm: Respiratory System - Gastrointestinal Tract (Except mouth and anus) - Thyroid Glands - Parathyroid Glands - Pharynx

Sequence of Animal Development: Cleaving -> Gastrulation -> Organogenesis

REGULATION OF BODILY FLUIDS

Homeostasis	from greek word "Homoios" means like or similar, and from the latin word "stasis" means standing state
	any process of bodily regulation that maintains an internal stable state
	includes bodily temperature, blood calcium levels, and level of blood glucose
Osmoregulation	**Osmoconformers** - internal osmolarity is *the same* with it's external environment
	Osmoregulators - internal osmolarity is *constantly regulated* regardless of the osmolarity within the environment.

REGULATION OF BODILY FLUIDS (cont)

Osmoregulation on Homeostasis	**Osmosis** - movement of water to solute materials in the body through a semipermeable membrane
	Osmolarity - concentration of solutes into water.
Kidney	regulates the concentration of water and minerals in the body

Sequence: Homeostasis -> Osmuregulation

ANIMAL REPRODUCTION

Sexual Reproduction	requires genetic material from two parents / combination of gametes for fertilization to produce offspring
	Internal Fertilization occurs inside the female organism's body / oviparity - eggs / ovoviviparity - eggs laid before hatch / viviparity - like mammals
	External Fertilization occurs apart from the female organism's body
Asexual Reproduction	requires one living organism to reproduce / offspring genetically identical
	Bianary Fission - organism duplicates its genetic material nd then divides into two parts (cytokinesis), with each new organism receiving one copy of DNA
	Budding - producing an individual through the buds that develop on the parent body
	Fragmentation - parent body divides into several fragments and each fragment develops into a new organism
	Regeneration - growing a new organism from the lost body part

RESPIRATORY SYSTEM

The Respiration begins when oxygen enters into our body through the nose and the mouth. The oxygen then travels through the trachea and pharynx where the trachea divides into two bronchi. Here, the bronchi are divided into bronchial tubes, in the chest cavity, so air can be directly moved into the lungs.

RESPIRATORY SYSTEM

Alveoli: They are like tiny grape-like sacs at the end of the tree of respiratory system and average adult has about 600 million alveoli. The exchange of oxygen and carbon dioxide gases occurs at the alveolar level.

Diaphragm: This is a primary muscle used in the process of inhalation, and exhalation. It is a dome shaped piece of muscle located in the lower ribs. Flattens when inhale, stretches and relaxes during exhale.

Adults breathe 12 to 20 times per minute. Average of 45 when exercising or doing an strenuous activity.

IMMUNE SYSTEM

- protects body from germs; bacteria, viruses, fungi, and toxins.

White Blood Cells known as *leukocytes* that protects the body from infections, injury, and illness.

Antibodies known as *immunogoblin* are proteins that protects your body from unwanted substances.

COMPLEMENT SYSTEM

- made up of a large number of distinct plasma proteins that react with one another to opsonize pathogens and induce a series of inflammatory responses that help to fight infection.

- interacting proteins are produced by the liver and activates when the system receives a signal

Carbohydrates turns into sugars that goes into the blood

Pancreas releases insulin that acts as a bridge for the sugar to go into the cell and use it for energy.

Type 1 Diabetes - body stops making insulin

Type 2 Diabetes - both body not making insulin and cells having insulin resistance

Prediabetes - blood sugar abaove typical but not enough to be diagnosed as diabetes

Gestational Diabetes - develops in second or third trimester of pregnancy

With diabetes, your body doesn't make enough insulin or can't use it as well as it should. When there isn't enough insulin or cells stop responding to insulin, too much blood sugar stays in your bloodstream. Over time, that can cause serious health problems, such as heart disease, vision loss, and kidney disease.

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