

Animal and Plant Systems

Primary TEKS Supported

10A – [Reporting Category 4] – describe the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals

10B – [Reporting Category 4] – describe the interactions that occur among systems that perform the functions of transport, reproduction, and response in plants
10C analyze the levels of organization in biological systems and relate the levels to each other and to the whole system

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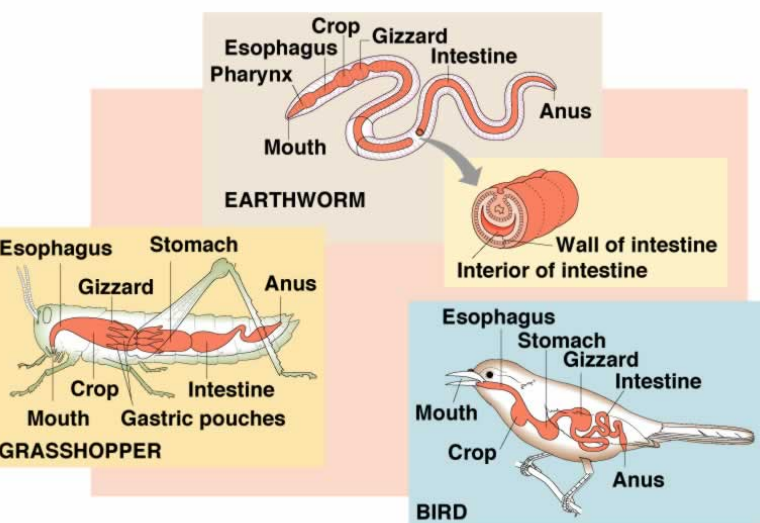
11A – [Reporting Category 4] – describe the role of internal feedback mechanisms in the maintenance of homeostasis

TEKS Also Supported

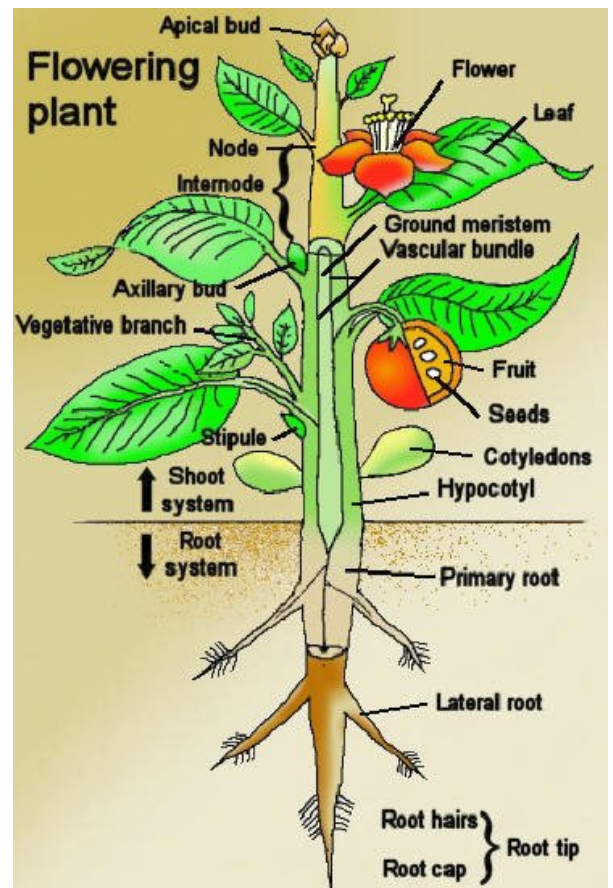
11C – [Reporting Category 5] – summarize the role of microorganisms in both maintaining and disrupting the health of both organisms and ecosystems

Contents of This Packet:

- I. Review and Practice
- II. Vocabulary Cards
- III. Practice Items
- IV. Sapling Instructions

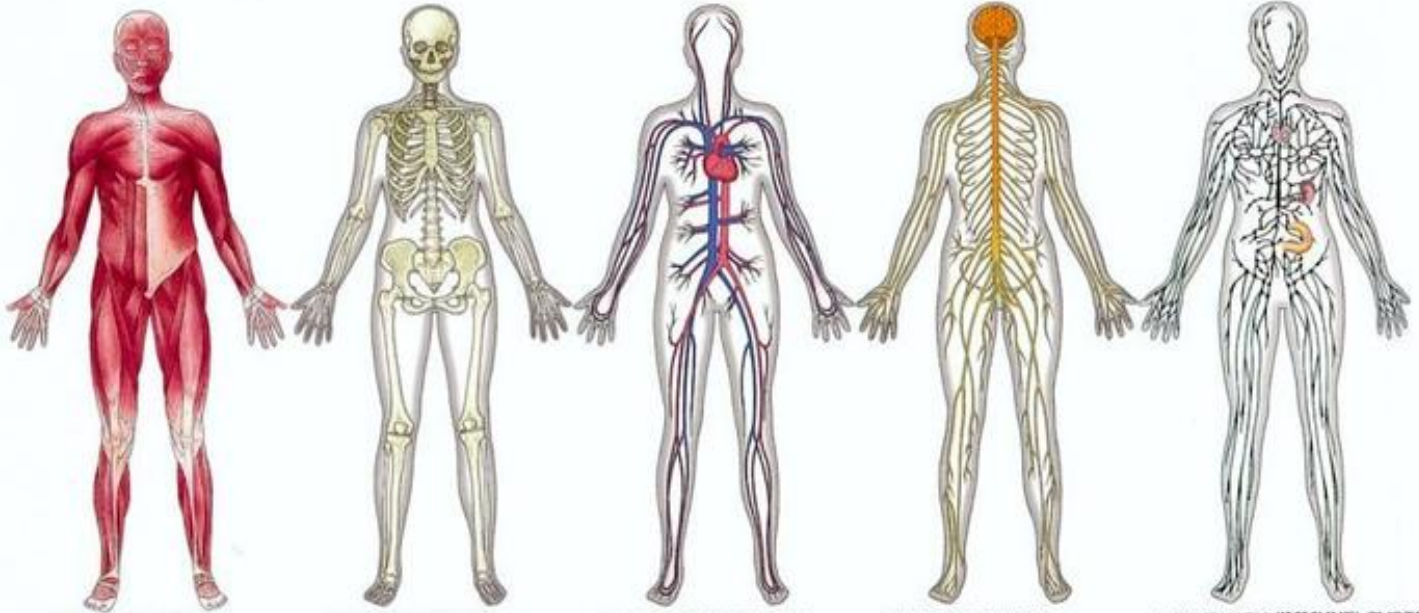


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Animal Body Systems:

Body systems must work together to keep an organism alive. No one individual body system can keep someone alive on its own.



▲ MUSCULAR SYSTEM

The muscular system consists of layers of muscles that cover the bones of the skeleton, extend across joints, and can contract and relax to produce movement.

▲ SKELETAL SYSTEM

The skeleton is a strong yet flexible framework of bones and connective tissue. It provides support for the body and protection for many of its internal parts.

▲ CIRCULATORY SYSTEM

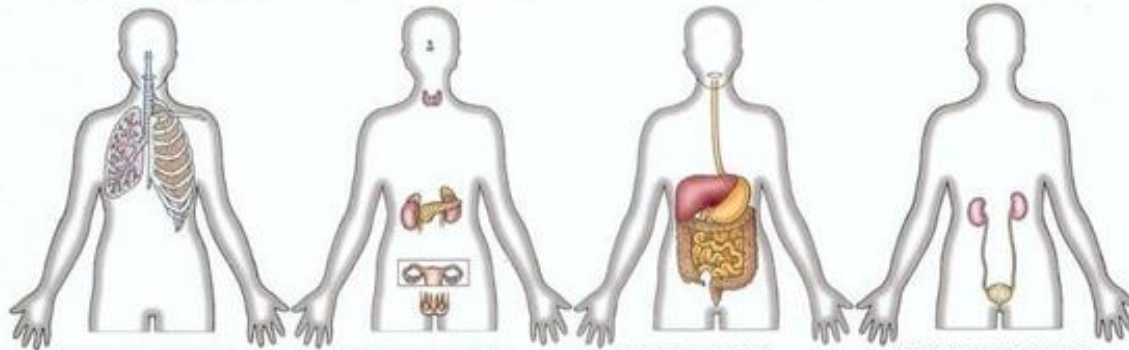
This system consists of the heart and a network of vessels that carry blood. It supplies oxygen and nutrients to the body's cells and removes waste products.

▲ NERVOUS SYSTEM

The nervous system is the body's main control system. It consists of the brain, the spinal cord, and a network of nerves that extend out to the rest of the body.

▲ LYMPHATIC (IMMUNE) SYSTEM

This system is a network of vessels that collects fluid from tissues and returns it to the blood. It also contains groups of cells that protect the body against infection.



▲ RESPIRATORY SYSTEM

The respiratory system is centered on the lungs, which work to get life-giving oxygen into the blood. They also rid the body of a waste product, carbon dioxide.

▲ ENDOCRINE SYSTEM

Many body processes, such as growth and energy production, are directed by hormones. These chemicals are released by the glands of the endocrine system.

▲ DIGESTIVE SYSTEM

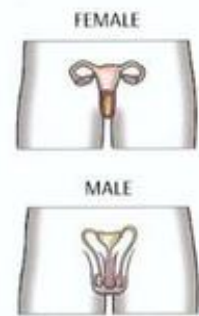
The digestive system takes in the food the body needs to fuel its activities. It breaks the food down into units called nutrients and absorbs the nutrients into the blood.

▲ EXCRETORY SYSTEM

The body's cells produce waste products, many of which are eliminated in urine. The job of the urinary system is to make urine and expel it from the body.

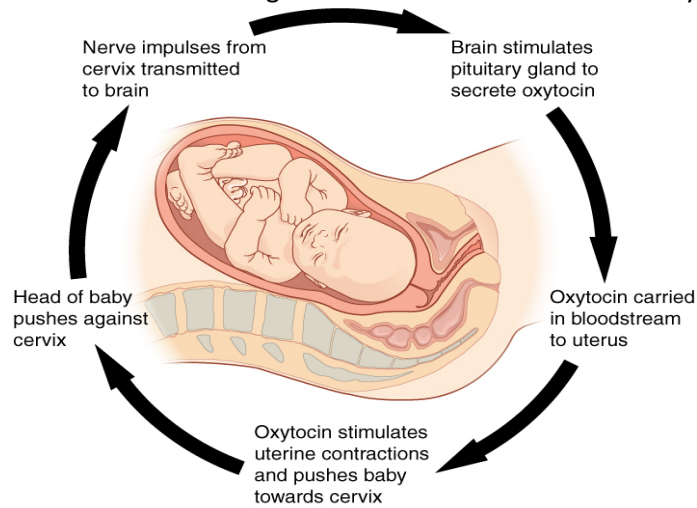
▲ REPRODUCTIVE SYSTEM

The male and female parts of the reproductive system produce the sperm and eggs needed to create a new person. They also bring these tiny cells together.



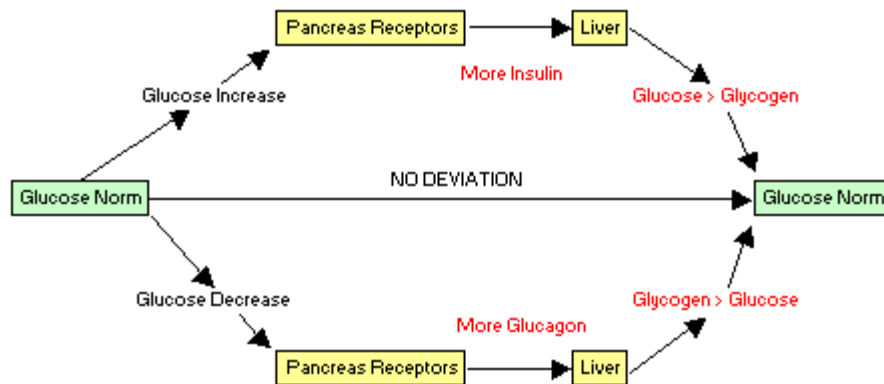
1. Feedback Mechanisms: Your body is able to regulate itself and maintain homeostasis through Feedback mechanisms.

- a. Positive Feedback: Keep increasing a response until the disturbance is over
 - i. Fever: Increasing body temperature until the virus/pathogen is “dead”
 - ii. Child Labor: Increasing muscle contractions until the baby is born



b. Negative Feedback: A check and balance system that will reverse the disruption or disturbance.

- i. Temperature
 - 1. Too Hot: the body releases sweat to cool down body temperature
 - 2. Too Cold: the body will begin to shiver, which means the muscles move creating heat, to warm the body up
- ii. Blood Glucose Levels
 - 1. The pancreas secretes insulin and glucagon in order to regulate blood glucose levels. Too high or too low glucose levels can cause the body to go into shock

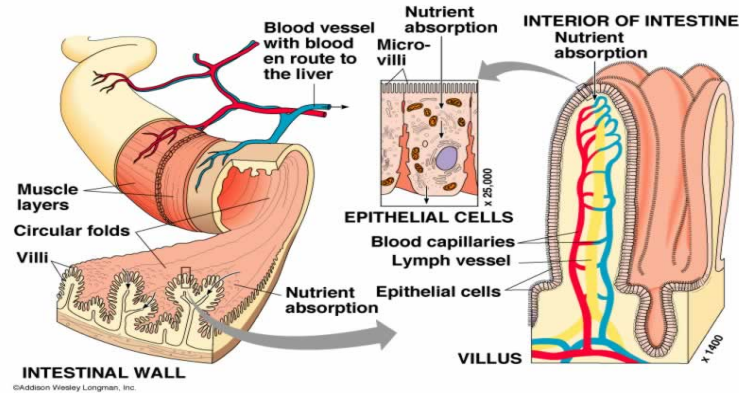


- iii. Heart Rate/Pulse: The heart pumps blood carrying oxygen to the rest of the body.
 - 1. Exercise can cause the heart to pump quicker in order to deliver enough oxygen to the muscles to maintain the level of activity

2. Body systems work together to maintain homeostasis (which is a balance). The following below are ways systems work together in order to regulate, absorb nutrients, reproduce, and protect for injury or illness.

- a. Regulation: the following are examples of how the body regulates --
 - i. Temperature: see above
 - ii. Heart Rate/Pulse: see above
 - iii. Breathing Rate: You can breathe faster or slower depending on the amount of oxygen you need and the amount of carbon dioxide you make as a waste and breathe out.
 - iv. Blood Glucose Sugar Levels: see above

- b. Nutrient Absorption: the body breaking down and absorbing nutrients from food
 - i. Digestive System and Circulatory System works together
 - 1. The Digestive system physically (chewing food, churning food in stomach) and chemically (saliva, enzymes, stomach acid) breaks down food polymers into monomers
 - 2. Once food has been broken down and reaches the small intestines, all the broken food (glucose) is absorbed into the blood stream.
 - a. The small intestines have microvilli which are finger-like projections that increase surface area in order to efficiently absorb digested food into the circulatory system.



- 3. Once the digested food gets absorbed into the circulatory system, the food travels in the blood streams to the muscles where the glucose (broken down food) gets converted into energy through Cellular Respiration in the muscle cell's mitochondria.
 - a. Cellular Respiration: $\text{Glucose} + \text{Oxygen} \rightarrow \text{Water} + \text{Carbon Dioxide} + \text{ATP (energy)}$

c. Reproduction

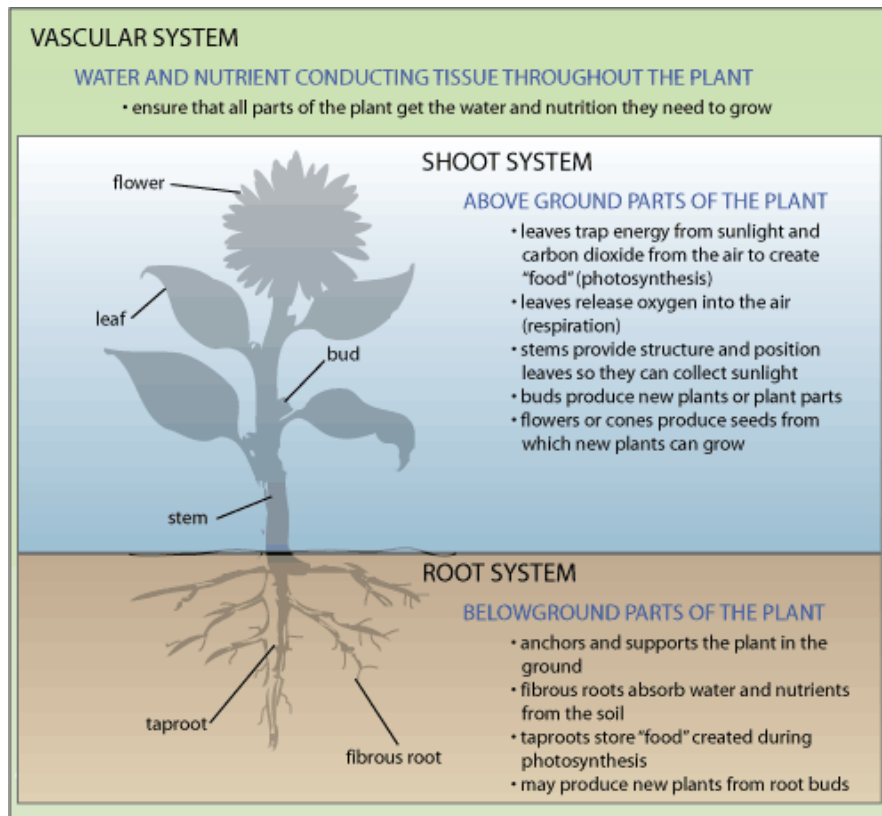
- i. Endocrine System and Reproductive System works together
 - 1. Endocrine System creates hormones, like Estrogen and Testosterone.
 - 2. Female Reproductive System creates egg game and the Male Reproductive System creates sperm gamete cells needed in order to create new life.

d. Defense from injury or illness

- i. Many organ systems work to help protect the body
 - 1. Integumentary System: Skin is the main barrier between the body and outside environment
 - 2. Immune System: White blood cells seek out and destroy foreign pathogens
 - 3. Respiratory System: hairs in the nose and mucus helps to trap and stop particles, like pollen and dust from entering the body.

Plant Systems:

Just like animal systems, plants have systems that work together to keep the plants alive.



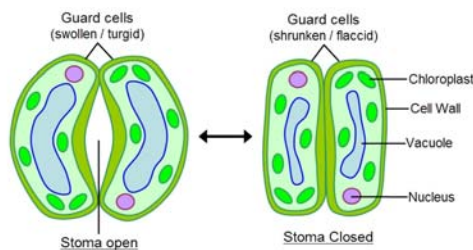
1. Plant Structures:

a. Leaf: Capture sunlight for photosynthesis

- i. Stomata: Small openings/pores in the leaf where water (transpiration) and respiratory gases (carbon dioxide and oxygen) can move in/out of the leaf
- ii. Guard Cells: Controls and regulates when stomata opens and closes

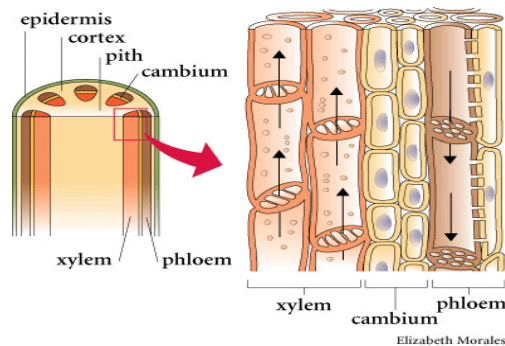
Stomata

- **Stomata** (sing. **stoma**) = pores in a leaf, mostly on the undersurface
- Each pore is surrounded by a pair of **guard cells**
- Guard cells can change shape to open or close the stoma

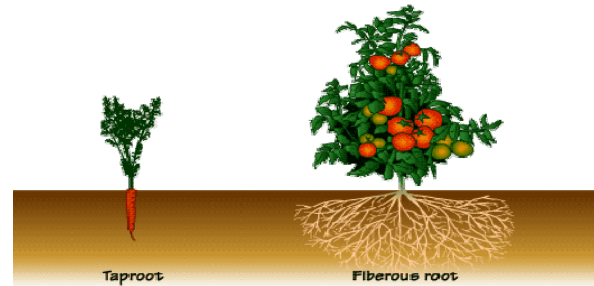
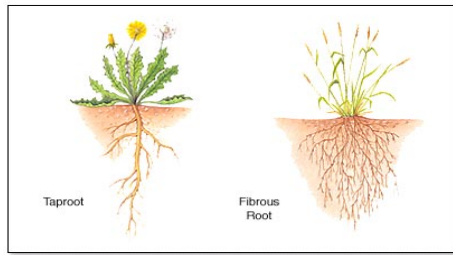


b. Stem/Trunk: Helps support leaves; has tubes that carry water, nutrients, and food throughout the plant

- i. Xylem: tube that carries water throughout the plant, from root to leaves
- ii. Phloem: tube that carries nutrients and food-> glucose throughout the plant



- c. Root : Helps to anchor the plant to the ground and absorb water for the plant to use in photosynthesis
- i. Fibrous Roots: small thick roots that are able to spread horizontally in search for water
 1. Grass
 - ii. Tap Roots: a single thick root that is good at anchoring plants to the ground
 1. Ex: Carrots



2. Each plant organ helps support the plant in the following systems:

Plant Systems	Organs/Structures	Description
Transport	Stem and Trunk -Phloem -Xylem Roots -Taproot -Fibrous Roots Leaves -Stomata -Guard Cells	Responsible for the movement of water, minerals, and food to travel to all parts of the plant
Reproduction	Flower -Male Portion -Stamen -Female Portion -Pistal	Responsible for the continuation of plant species by sexual or asexual means Asexual Reproduction in Plants – Plants can reproduce by asexual (vegetative) means. Asexual plants are able to reproduce through structures such as rhizomes, plantlets, or runners. The new plants are genetically identical to the parent plant unlike sexual reproduction. Sexual Reproduction in Plants – Plants can reproduce sexually using structures found in the plant flower . The male reproductive structure produces sperm cells (pollen) . The female reproductive structures include the ovule that produces the egg cells (ova) . Pollination - The transfer of pollen from the anthers of a flower to the stigma of the same flower or of another flower. Flowers are bright and colorful to attract pollinators like bee. Pollination is a prerequisite for fertilization : the fusion of nuclei from the pollen grain with nuclei in the ovule. Fertilization allows the flower to develop seeds which then goes through germination - the process in which a plant emerges from a seed and begins growth.
Response		Allows plant to receive information from their surrounds and translate it into some type of action Hormones : can control when a plant's reproduction process (flower) Tropisms : process where plants receive information from the environment and translate it into a response: <ul style="list-style-type: none"> -Thigmotropism: responds to touch (vines) -Phototropism: responds to light -Hydrotropism: responds to water -Gravitropism: responds to gravity