BLUE VALLEY DISTRICT CURRICULUM OVERVIEW

Human Anatomy and Physiology



UNIT: Blood

ESSENTIAL QUESTIONS	BIG IDEAS
Why is blood an important diagnostic tool?	 Student will communicate the roles blood plays in health.

GUIDING QUESTIONS

Content

- What are the components and functions of whole blood?
- How do antigens and antibodies translate into a blood type?
- How are different substances transported in blood?

Process

- How does the structure of the RBC make it the ideal transporter of oxygen and carbon dioxide?
- How can we use Anti-sera (antibodies) to identify blood types?
- How is blood production stimulated?
- How does blood doping work to enhance athletic performance?
- How does the quantity of water in the body affect blood flow?

Reflective (Why)

- Why do we blood type patients before surgery?
- What kinds of problems arise if homeostasis is disrupted?

UNIT: Cardiovascular

ESSENTIAL QUESTIONS	BIG IDEAS
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Is it more important for your lungs to breathe or your heart to beat?

• Students will be able to communicate how cardiac tissue contracts to move blood throughout the body.

GUIDING QUESTIONS

Content

- What are the chambers, valves, and great vessels of the heart?
- What is the route of an RBC through the body?
- What are the three categories of blood vessels and how does their structure contribute to blood flow?

Process

- How does cardiac tissue receive nutrients?
- How is blood pressure maintained?
- How does the heart's conduction system function to control the heart and how is this represented on a normal electrocardiogram?

- Why are cholesterol levels used to determine and predict cardiovascular health?
- What happens when the cardiovascular system cannot maintain homeostasis?

UNIT: Digestive

ESSENTIAL QUESTIONS	BIG IDEAS
What happens to the food you eat?	 The student will communicate how the structures of the digestive system contribute to the breakdown and absorption of food through mechanical and chemical actions.

GUIDING QUESTIONS

Content

- What are the structures and functions of the digestive system?
- What happens to substances that are not digested?

Process

• How is food processed (mechanically and chemically) and absorbed?

Reflective

• What kinds of problems arise if homeostasis is disrupted?

UNIT: Histology

ESSENTIAL QUESTIONS	BIG IDEAS

How can healthcare professionals use their understanding of tissues to predict organ function and diagnose disease?

 The student will communicate how the tissues of the body are categorized and work together to maintain homeostasis of our organ systems.

GUIDING QUESTIONS

Content

- What are the four major tissue types and subcategories of each?
- What are the characteristics of each of the four major tissue types?
- What are endocrine and exocrine glands?
- What kinds of problems arise if homeostasis is disrupted?

Process

- How are tissues interconnected in organs?
- How do you differentiate between different tissue types using a microscope?

- How does cell structure determine a tissue's function?
- Why do most cancers arise in epithelial tissues?

UNIT: Immune

ESSENTIAL QUESTIONS BIG IDEAS

Why are we healthy most of the time?

• The student will communicate how the body defends itself from pathogens and symptoms that indicate signs of an infection.

GUIDING QUESTIONS

Content

- What are the body's innate (non-specific) defenses?
- What are the body's adaptive (specific) defenses?

Process

- What are the series of events that take place as the body defends itself against an invader?
- How do antibodies and vaccines aid the immune system?

- Why are vaccinations important for public health?
- Why are viral infections treated differently than bacterial infections?
- What are the implications of misuse of antibiotics?
- What happens when our immune system is compromised?
- What kinds of problems arise if homeostasis is disrupted?

UNIT: Integumentary

BIG IDEAS

Why are third degree burns potentially life threatening?

• Students will communicate the role of the integument in regulating homeostasis and defense against microbes.

GUIDING QUESTIONS

Content

- How does skin contribute to the body's homeostasis?
- What are the major structures of skin in each layer and what are the functions of each?
- What are the accessory organs of the skin and what is the role of each?
- What are the differences between first, second and third degree burns?

Process

- How does skin cancer arise?
- How does our skin protect us from pathogens?
- What determines whether an injury of the integument will regenerate or undergo fibrosis?

- Why are the tissues of the integument (stratified squamous, dense irregular, adipose, areolar) best suited to their location?
- Why and how does our skin change as we age?

UNIT: Muscular

ESSENTIAL QUESTIONS BIG IDEAS

Why do athletes and bodybuilders train differently?

• The student will communicate how muscle structure (micro and macro) contributes to power, strength and flexibility.

GUIDING QUESTIONS

Content

- What are the functions of the muscular system?
- How do muscles attach to bones?
- What are the principal axial and appendicular muscles of the body and their actions?
- How do the 3 different types of muscle tissues compare to one another?

Process

• How does a muscle cell contract?

- Why are skeletal muscle cells multinucleated?
- Why is stretching important for muscle function?
- Why do steroids lead to muscle growth?
- What kinds of problems arise if homeostasis is disrupted?

UNIT: Nervous

ESSENTIAL QUESTIONS	BIG IDEAS
How do humans survive in a changing environment?	 Student will communicate how our body receives and responds to stimuli.

GUIDING QUESTIONS

Content

- How does the structure of the neuron contribute to conduction of the impulse?
- How are neural pathways organized within the CNS and PNS to insure communication?
- How are the brain and spinal cord protected?
- How does the brain function as an integration center?

Process

• How do neuroglia and neurons work together to send and receive messages?

- Why do neurons have cytoplasmic extensions?
- Why do spinal cord injuries lead to paralysis?
- Why are some types of brain tumors more common than others?
- What kinds of problems arise in the nervous system if homeostasis is disrupted?

UNIT: Respiratory

ESSENTIAL QUESTIONS	BIG IDEAS
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What happens to the oxygen we breathe in?.

 Students will explain how the structures of the respiratory system contribute to gas exchange between the body and the external environment.

GUIDING QUESTIONS

Content

- What are the structures of the upper and lower respiratory tract?
- What are the various respiratory volumes and capacity and how are they measured?

Process

- What are the processes of external respiration and internal respiration?
- How does the body move air in and out of the lungs?

- Why are inhalants (pollution, vaping/smoking, etc.) so harmful to your lungs?
- How does asthma affect airflow?
- Why are the lungs a typical location for secondary tumors?

UNIT: Skeletal

ESSENTIAL QUESTIONS	Bl	G IDEAS
What does it mean that bones are dynamic structures?	•	Students will be able to communicate how bones change over time and the possible results of homeostatic imbalances.

GUIDING QUESTIONS

Content

- What are the functions of the skeletal system?
- What are the components of bone tissue?
- What are the bones of the axial and appendicular skeleton?

Process

- How do compact and spongy bone tissue differ structurally?
- How are the bones of the skeleton classified?
- How do bones change over time?
- How do our bones connect?

- Why is compact bone tissue found in the diaphysis (shaft) of long bones rather than spongy bone tissue?
- What kinds of problems arise if homeostasis is disrupted?