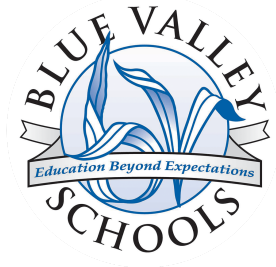


BLUE VALLEY DISTRICT CURRICULUM OVERVIEW

Human Anatomy and Physiology



UNIT: Blood

ESSENTIAL QUESTIONS

Why is blood an important diagnostic tool?

BIG IDEAS

- 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

Is it more important for your lungs to breathe or your heart to beat?

BIG IDEAS

- 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?

Reflective

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

UNIT: Digestive

ESSENTIAL QUESTIONS

What happens to the food you eat?

BIG IDEAS

- 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

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

BIG IDEAS

- 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?

Reflective

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

UNIT: Immune

ESSENTIAL QUESTIONS

Why are we healthy most of the time?

BIG IDEAS

- 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?

Reflective

- 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

ESSENTIAL QUESTIONS

Why are third degree burns potentially life threatening?

BIG IDEAS

- 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?

Reflective

- 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

Why do athletes and bodybuilders train differently?

BIG IDEAS

- 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?

Reflective

- 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

How do humans survive in a changing environment?

BIG IDEAS

- 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?

Reflective

- 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

What happens to the oxygen we breathe in?.

BIG IDEAS

- 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?

Reflective

- 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

What does it mean that bones are dynamic structures?

BIG IDEAS

- 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?

Reflective

- 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?