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

<table>
<thead>
<tr>
<th>ESSENTIAL QUESTIONS</th>
<th>BIG IDEAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is it more important for your lungs to breathe or your heart to beat?</td>
<td>● Students will be able to communicate how cardiac tissue contracts to move blood throughout the body.</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>What happens to the food you eat?</td>
<td>The student will communicate how the structures of the digestive system contribute to the breakdown and absorption of food through mechanical and chemical actions.</td>
</tr>
</tbody>
</table>

### GUIDING QUESTIONS

<table>
<thead>
<tr>
<th>Content</th>
<th>Process</th>
<th>Reflective</th>
</tr>
</thead>
<tbody>
<tr>
<td>● What are the structures and functions of the digestive system?</td>
<td>● How is food processed (mechanically and chemically) and absorbed?</td>
<td>● What kinds of problems arise if homeostasis is disrupted?</td>
</tr>
</tbody>
</table>
## 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

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<td>Why are third degree burns potentially life threatening?</td>
<td>• Students will communicate the role of the integument in regulating homeostasis and defense against microbes.</td>
</tr>
</tbody>
</table>

### 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

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<tr>
<td>Why do athletes and bodybuilders train differently?</td>
<td>• The student will communicate how muscle structure (micro and macro) contributes to power, strength and flexibility.</td>
</tr>
</tbody>
</table>

## 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**

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<tr>
<td>What happens to the oxygen we breathe in?</td>
<td>Students will explain how the structures of the respiratory system contribute to gas exchange between the body and the external environment.</td>
</tr>
</tbody>
</table>

**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

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<tr>
<td>What does it mean that bones are dynamic structures?</td>
<td>● Students will be able to communicate how bones change over time and the possible results of homeostatic imbalances.</td>
</tr>
</tbody>
</table>

### 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?