## Unit 3
### Disease & Survival

**Timeline:** Quarter 3

## Course Description:
The purpose of this course is to help students gain a better understanding of their own bodies and the constant need to maintain balance in living things. Investigations and assessments will require students to apply their knowledge to real-world situations. Students will develop laboratory techniques, study skills, and presentation abilities that will help them in college and beyond.

**Length of Course:** One Year / Two Semesters

## Essential Questions

- How are oxygen and nutrients delivered to all the cells of the body?
- How are respiratory and cardiovascular health assessed?

## Standards

8.13 (Health Standard) Explain how the immune system functions to prevent and combat disease.

4.2 Explain how the circulatory system (heart, arteries, veins, capillaries, red blood cells) transports nutrients and oxygen to cells and removes cell wastes.

4.3 Explain how the respiratory system (nose, pharynx, larynx, trachea, lungs, alveoli) provides exchange of oxygen and carbon dioxide.

## Skills

**CCSS.ELA-LITERACY.SL.11-12.1A**
Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.

**CCSS.ELA-LITERACY.SL.11-12.4**
Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

**CCSS.ELA-LITERACY.SL.11-12.5**
Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

**CCSS.ELA-LITERACY.W.11-12.7**
Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

**CCSS.ELA-LITERACY.RST.11-12.2**
Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

**CCSS.ELA-LITERACY.RST.11-12.3**
Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

**CCSS.ELA-LITERACY.RST.11-12.4**
Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.

**CCSS.ELA-LITERACY.RST.11-12.9**
Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

**CCSS.ELA-LITERACY.W.11-12.2.E**
Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

**CCSS.ELA-LITERACY.W.11-12.2.F**
Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).

**NGSS Science Practice 1**: Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.

**NGSS Science Practice 2**: Develop a complex model that allows for manipulation and testing of a proposed process or system.

**NGSS Science Practice 4**: Consider limitations of data analysis (e.g., measurement error, sample selection) when analyzing and interpreting data.

**NGSS Science Practice 7**: Respectfully provide and/or receive critiques on scientific arguments by probing reasoning and evidence, challenging ideas and conclusions, responding thoughtfully to diverse perspectives, and determining additional information required to resolve contradictions.

### Assessments/Products

- Students will demonstrate understanding of facts and concepts through tests and quizzes that ask them to apply their knowledge of the body to real-life situations.
- Students will demonstrate their ability to use vocabulary correctly through laboratory reports, writing assignments, and class discussions.
- Students will demonstrate their ability to use microscopes and dissection tools through extended laboratory investigations.
- Students will demonstrate their ability to perform research and present it using technology through a case study of a patient.
Notebooks:

- **Content Notes (every day or close to it):** Students will identify topics; identify the main ideas and most important details and examples associated with each topic; include summaries as well as student-generated follow-up questions and answers, reflections, visualizations, and responses to the content, using higher order thinking skills (e.g., predict, connect, infer, analyze, evaluate, categorize, synthesize).

- **Vocabulary:** Students will highlight additional, key vocabulary in their notebooks; they will build an understanding of the vocabulary using vocabulary-development exercises (e.g., word webs, Frayer Model), as well as use the vocabulary in their daily work and conversations.

- **Narrative and Explanatory Essay (in response to one or more Essential and Guiding Questions)/Investigation Reports:** Student work will include evidence of planning: graphic organizers, brainstorming lists; editing of language, vocabulary, grammar, structure; organized and developed ideas utilizing precise and domain specific language; student sharing, student and teacher feedback, and revisions based on these conversations. Argumentative essays/investigation reports will include an explicit claim, scientific evidence in support of the claim (from reports, data, observations, etc.), and an explanation of how the evidence connects to and verifies the claim.
Texts, Materials, and Resources

**Laboratory Investigations:**
- Virtual [bacteriology laboratory](#).
- Virtual [microbiology lab](#).
- Virtual [sheep heart dissection](#).

**Websites:**
- [Microbiology animations](#) (techniques, viruses, antibiotics)
- Animations of bacterial motility, division, etc.
- The [Immune System Game](#).
- Animated video of the [Immune Response](#).
- [Blood Groups](#) Interactive.
- The [Blood Typing Game](#).
- Review the [respiratory organs](#).
- [Respiratory system](#) labeling interactive.
- [Heart](#) labeling interactive.
- Interactive “Map” of the [Human Heart](#).
- Interactive Cardiovascular Library.

**Videos:**
- [Blood](#) (20:22) – older video but the information is accurate – comes with resources and handouts.
- [The Circulatory System](#) (23:00) with resources.
- [The Circulatory System](#) (24:41) – detailed, with lots of captions for note-taking.
- [The Respiratory System](#) (23:00) with resources.
- [Investigation Human Biology](#): especially segments on Flu Virus (7:40), Circulatory System (9:30) and Respiration (7:49).
- [The Human Condition/Heart Health](#) (29:18)
- [Bleeding and Soft Tissue Injuries](#) (26:16) with discussion guide.
- [First Aid](#) and Disease Transmission (5:10), Respiratory Diseases (4:43) with discussion guide.
- [Health: When Sex, Race, and Location Matter](#) – segments on Asthma (8:08), Heart Disease (5:47) and HIV (7:15)

**Vocabulary**

Tier II: appetite, artificial, carry out, component, concentration, develop, discuss, exchange, hyperactivity, inflammation, moisten, particles, primary, provide, transfer, transport

Tier III: alveoli, aorta, artery, atrium, blood stream, bronchi, capillary, clot, diaphragm, hemoglobin, immune system, iron, larynx, lung, mucous membrane, nutrient, oxygen, pacemaker, pharynx, plasma, platelet, pulmonary artery, pulmonary vein, red blood cell, septum, spleen, trachea, vein, vena cava, ventricle, white blood cell
<table>
<thead>
<tr>
<th>Anatomy &amp; Physiology Curriculum Map</th>
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<tbody>
<tr>
<td><strong>Unit 4</strong></td>
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<tr>
<td>Digestion &amp; Reproduction</td>
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<td><strong>Timeline: Quarter 4</strong></td>
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<td><strong>Essential Questions</strong></td>
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<td>Why food is so essential for life?</td>
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<td>How is our body so able to select nutrients from food and get rid of the waste?</td>
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<td>What would happen if your blood did not pass through the kidneys?</td>
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<tr>
<td>Why is dialysis necessary for some people?</td>
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<td>How is the human body designed for reproduction?</td>
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<td><strong>Standards</strong></td>
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<td>4.1 Explain generally how the digestive system (mouth, pharynx, esophagus, stomach, small and large intestines, rectum) converts macromolecules from food into smaller molecules that can be used by cells for energy and for repair and growth</td>
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<td>4.2. Describe how the kidneys and the liver are closely associated with the circulatory system as they perform the excretory function of removing waste from the blood. Recognize that kidneys remove nitrogenous wastes, and the liver removes many toxic compounds from blood</td>
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<td>4.11(Health Standard) Identify the stages of the male and female reproductive systems over the life cycle</td>
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### Assessments/Products
- Inquiry Lab: Let’s Diagnose Them – Digestive By-Products and Body Mass Index Analysis
- Inquiry Lab: Yeast Cells and Digestion of Nutrients
- Inquiry Lab: Modeling the Digestive System
- A Sweet Indigestion: A Directed Case Study on Carbohydrates – Activity
- Quick Lab: Kidney Filtration Model
- Inquiry Lab: Let’s Diagnose Them – Urinalysis
- Stolen Kidneys Activity

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**Other Sample Products:** KWL Charts. Venn Diagrams, Concept Maps, H.O.T. Boxes.

### Texts, Materials, and Resources
- *Holt Biology*
- *Anatomy and Physiology for Health Professional Textbook*
- *Laying the Foundation – NMS Initiative*
- [www.anatomycorner.com](http://www.anatomycorner.com)
- *Diagnosis for Classroom Success – Making Anatomy and Physiology Come Alive*
- [www.biologycorner.com](http://www.biologycorner.com)

### Vocabulary
- **Tier II:** absorb, convert, crush, grind, liquefy, reabsorb, swallow
- **Tier III:** amino acids, chemical digestion, complex carbohydrates, digestive tract, egg, enzymes, esophagus, fatty acid, fiber, gall bladder, gamete, gastric juice, kidney, large intestine, lipids, liver, macromolecules, monosaccharides, mouth, nutrient, offspring, ovary, oviduct, pancreas, pharynx, physical digestion, polypeptides, polysaccharides, proteins, rectum, small intestine, sperm, stomach, testes, urethra, uterus, vas deferens