Madison Public Schools

Anatomy and Physiology - Unit 4 - Respiratory System or Digestive System

Unit Focus

After performing experiments focused on the respiratory and digestive systems, the students will have the choice of which system they would like to investigate in depth. Throughout the unit, students will work to uncover the details of their chosen system and develop a model and website to explain the structures and functions of the body system. The website, which will include the student-developed model, will be used for the summative assessment in which students will analyze a case study and determine the physiological cause of the symptoms.

Stage 1: Desired Results - Key Understandings

Standard(s)

Next Generation Science
High School Life Sciences: 9 - 12

- Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. *HS-LS1-2*

Next Generation Science Standards (DCI)
Science: 10

- Systems of specialized cells within organisms help them perform the essential functions of life. *LS1.9.A1*
- Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. *LS1.9.A4*

Student Growth and Development 21st Century Capacities Matrix
Critical Thinking

- Analyzing: Students will be able to examine

Transfer

T1 Create models to explore complex systems, show mastery of key science concepts, and/or develop solutions through creation of a product open to testing and redesign.
T2 Communicate effectively based on purpose, task, and audience to promote collective understanding and/or recommend actions.

Meaning

Understanding(s)

U1 The structure of a given organ or organ system is related to its function.
U2 Individual components of a body system all work together to create a functioning system.
U3 When the natural feedback loops or structures and functions of a system fail, typical symptoms will manifest that can be used to analyze the underlying causes of the issue.

Essential Question(s)

Q1 How does structure relate to function?
Q2 How does the body regulate input and output?
Q3 How do the components of a body systems function together to allow organisms to complete a specified task, either voluntarily or involuntarily?
Q4 How can I apply my understanding of how body system work to analyze a medical issue?

Acquisition of Knowledge and Skill

Knowledge

K1 The respiratory system and digestive systems both eliminate the waste created from cellular respiration and digestion from the body.
K2 The digestive system relies on the oxygen obtained from the respiratory system in order to break down food into the nutrients that an organism needs to survive.

Skill(s)

S1 Conducting research to investigate, model, and communicate detailed information about a body system.
S2 Developing a visual model that explains how the individual parts of a body system work together to make a functioning system.
S3 Creating a website that correctly uses medical

Stage 1: Desired Results - Key Understandings		
information/data/evidence to make inferences and identify possible underlying assumptions, patterns, and relationships. *MM.1.2* *Creative Thinking* • Design: Students will be able to engage in an appropriate process to refine their product. *MM.2.3* *Collaboration/Communication* • Product Creation: Students will be able to effectively use a medium to communicate important information (findings, ideas, feelings, issues, etc.) for a given purpose. *MM.3.2*	**K3** The major structures of the respiratory system are: the diaphragm, trachea, bronchi, bronchioles, alveoli, and capillaries. All of which work together and have specific structures that allow them to function in support of the respiratory system. **K4** Air pressure (both atmospheric and internal) and volume play a role in our ability to inhale and exhale. **K5** Students will know the difference between the following volumes: tidal, inspiratory reserve, expiratory reserve, and residual. The will also know the meanings of vital capacity and total lung capacity. **K6** The major components of the digestive systems are: teeth, saliva, esophagus, stomach, small intestine, large intestine, liver/gallbladder, and rectum. All of which work together and have specific structures that allow them to function in support of the digestive system. **K7** Villi play a prominent role in the small intestine and the overall function of the digestive system. **K8** Students will know where in the digestive system different components of food (proteins, carbohydrates, lipids, and fiber) are broken down what is used to break down these various components (chemicals, enzymes, etc.).	terminology and that can be used as a reference for others to learn about a chosen body system. **S4** Analyzing case studies and applying content to determine the physiological cause of the condition.