

NEW MILFORD PUBLIC SCHOOLS

New Milford, Connecticut



Anatomy and Physiology II

June 2016

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New Milford Public Schools
Honors Anatomy & Physiology II Curriculum

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| <p>Committee Member(s): Karen Terhaar Robin Barboza-Josephson</p> <p>Unit Title: Unit 1 - Integration & Coordination</p> | <p>Course/Subject: Honors Anatomy & Physiology II</p> <p>Grade Level: 11 - 12 # of Weeks: 5</p> |
| Identify Desired Results | |
| Common Core Standards | |
| <ul style="list-style-type: none"> ● HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. [Clarification Statement: Emphasis is on functions at the organism system level such as nutrient uptake, water delivery, and organism movement in response to neural stimuli. An example of an interacting system could be an artery depending on the proper function of elastic tissue and smooth muscle to regulate and deliver the proper amount of blood within the circulatory system.] [Assessment Boundary: Assessment does not include interactions and functions at the molecular or chemical reaction level.] ● HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. [Clarification Statement: Examples of investigations could include heart rate response to exercise.] [Assessment Boundary: Assessment does not include the cellular processes involved in the feedback mechanism.] ● 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.WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research. | |
| Enduring Understandings | Essential Questions |
| Generalizations of desired understanding via essential questions (Students will understand that ...) | Inquiry used to explore generalizations |
| <ul style="list-style-type: none"> ● 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 | <ul style="list-style-type: none"> ● How do the structures of organisms enable life's function? ● How do organisms detect, process, and use information about the environment? ● What are the physiological mechanisms that allow organ |

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| <p>mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3)</p> <ul style="list-style-type: none"> • | <p>systems to function?</p> |
| <p>Expected Performances What students should know and be able to do</p> | |
| <p>Students will know the following:</p> <ul style="list-style-type: none"> • How interactions among hormones, senses, and nerves make possible the coordination of functions of the body • The physiology of electrochemical impulses and neural integration and be able to trace the pathway of an impulse and relate biochemical changes involved in the conduction of the impulse • How the body perceives internal and external stimuli and responds to maintain a stable internal environment, as it related to biofeedback <p>Students will be able to do the following:</p> <ul style="list-style-type: none"> • Analyze how the nervous system is organized at the cellular level to coordinate and integrate the functions of the other body systems. • Analyze how the nervous system receives internal and external cues, processes incoming information, and decides what action to take. • Connect how your somatic and special senses function to process and act on sensory information. • Analyze how the functions of the nervous system and the endocrine system differ and how do they complement one another. | |
| <p>Character Attributes</p> | |
| <ul style="list-style-type: none"> • Citizenship • Respect • Responsibility • Compassion | |
| <p>Technology Competencies</p> | |
| <ul style="list-style-type: none"> • Students use technology to research, communicate, collaborate and solve an authentic problem. | |
| <p>Develop Teaching and Learning Plan</p> | |
| <p>Teaching Strategies:</p> <ul style="list-style-type: none"> • Use gradual release model • PowerPoint presentations and notes • Laboratory investigations | <p>Learning Activities:</p> <ul style="list-style-type: none"> • Neuron Model Analysis • POGIL activities (using models) • Examining Reflexes • Mapping Taste Receptors |

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| <ul style="list-style-type: none"> ● Case Study Investigations ● Cooperative grouping ● Audio Visual presentations ● Research ● Nonlinguistic representations | <ul style="list-style-type: none"> ● Testing Equilibrium Station Activity ● Evaluating Visual Acuity ● Case Study Analysis ● Cat Dissection |
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Assessments

| Performance Task(s) | Other Evidence |
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| Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period) | Application that is functional in a classroom context to evaluate student achievement of desired results |
| <p>Goal: To construct a brain cap with all regions and functions of the brain researched and labeled</p> <p>Role: Brains</p> <p>Audience: Students</p> <p>Situation: A room full of naked brains</p> <p>Product or Performance: An illustrated paper skull cap with all the regions and functions of the brain labeled</p> <p>Standards for Success: Complete and accurate based on rubric</p> | <ul style="list-style-type: none"> ● Formative quizzes ● Summative unit assessments ● Lab Reports ● Case Study notes ● Poster and Presentation of case study results |

Suggested Resources

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| <ul style="list-style-type: none"> ● Hole, John W, David Shier, Jackie Butler, and Ricki Lewis. <i>Hole's Essentials of Human Anatomy & Physiology</i>. Boston. Mass: WCB/McGraw-Hill, 2003. Print. |
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| <p>Committee Member(s): Karen Terhaar Robin Barboza-Josephson</p> <p>Unit Title: Unit 2 - Transport</p> | <p>Course/Subject: Honors Anatomy & Physiology II</p> <p>Grade Level: 11 - 12 # of Weeks: 5</p> |
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Identify Desired Results

Common Core Standards

- HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. [Clarification Statement: Emphasis is on functions at the organism system level such as nutrient uptake, water delivery, and organism movement in response to neural stimuli. An example of an interacting system could be an artery depending on the proper function of elastic tissue and smooth muscle to regulate and deliver the proper amount of blood within the circulatory system.] [Assessment Boundary: Assessment does not include interactions and functions at the molecular or chemical reaction level.]
- HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. [Clarification Statement: Examples of investigations could include heart rate response to exercise.] [Assessment Boundary: Assessment does not include the cellular processes involved in the feedback mechanism.]
- 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.WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

| Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that ...) | Essential Questions Inquiry used to explore generalizations |
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| <ul style="list-style-type: none"> ● 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. (HS-LS1-3) | <ul style="list-style-type: none"> ● How do the structures of organisms enable life's function? ● How do organisms obtain and use the matter and energy they need to live and grow? ● What are the physiological mechanisms that allow organ systems to function? |
| Expected Performances What students should know and be able to do | |
| Students will know the following: <ul style="list-style-type: none"> ● The relationships between the cardiovascular and respiratory systems as they obtain oxygen needed for the oxidation of nutrients and the removal of carbon dioxide ● The relationship between the lymphatic and cardiovascular systems in circulation and immune functions | |

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| <p>Students will be able to do the following:</p> <ul style="list-style-type: none"> Analyze how the cardiovascular system powers and transport oxygen, nutrients and waste to and from the cells. Analyze how blood functions in oxygen transportation and infection control. Apply concepts to explain how the lymphatic system function for transportation and immunity. | |
| Character Attributes | |
| <ul style="list-style-type: none"> Citizenship Respect Responsibility Compassion | |
| Technology Competencies | |
| <ul style="list-style-type: none"> Students use technology to research, communicate, collaborate and solve an authentic problem. | |
| Develop Teaching and Learning Plan | |
| <p>Teaching Strategies:</p> <ul style="list-style-type: none"> Use gradual release model PowerPoint presentations and notes Laboratory investigations Case Study Investigations Cooperative grouping Audio Visual presentations Research Nonlinguistic representations | <p>Learning Activities:</p> <ul style="list-style-type: none"> Pulse Rate and Blood Pressure Lab Structure of the Heart Labeling Lab POGIL activities (using models) Case Study Analysis Cat Dissection |

| Assessments | |
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| Performance Task(s) | Other Evidence |
| <p>Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)</p> | <p>Application that is functional in a classroom context to evaluate student achievement of desired results</p> |
| <p>Goal: to solve a case study investigation</p> <p>Role: volunteer at a first aid station</p> <p>Audience: the EMT who appears at the scene and is questioning you</p> <p>Situation: Road Race Fundraiser - 25 year old runner - tightness in chest - pain - dizzy - faint - short of breath at</p> | <ul style="list-style-type: none"> Formative quizzes Summative unit assessments Lab Reports Case Study notes Poster and Presentation of case study results |

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| <p>the 1-K mark - first race - no history of heart attacks or high blood pressure - low levels of cholesterol and fat in blood - well hydrated - good breakfast in am</p> <p>Product or Performance: poster and presentation with the possible cardiovascular system problems causing the illness</p> <p>Standards for Success: Presentation of data and fact based listing of possible problems based on student understanding of the cardiovascular system</p> | |
| Suggested Resources | |
| <ul style="list-style-type: none"> Hole, John W, David Shier, Jackie Butler, and Ricki Lewis. <i>Hole's Essentials of Human Anatomy & Physiology</i>. Boston. Mass: WCB/McGraw-Hill, 2003. Print. | |

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| <p>Committee Member(s): Karen Terhaar Robin Barboza-Josephson</p> <p>Unit Title: Unit 3 - Absorption & Excretion</p> | <p>Course/Subject: Honors Anatomy & Physiology II</p> <p>Grade Level: 11 - 12 # of Weeks: 5</p> |
| Identify Desired Results | |

Common Core Standards

- HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. [Clarification Statement: Emphasis is on functions at the organism system level such as nutrient uptake, water delivery, and organism movement in response to neural stimuli. An example of an interacting system could be an artery depending on the proper function of elastic tissue and smooth muscle to regulate and deliver the proper amount of blood within the circulatory system.] [Assessment Boundary: Assessment does not include interactions and functions at the molecular or chemical reaction level.]
- HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. [Clarification Statement: Examples of investigations could include heart rate response to exercise.] [Assessment Boundary: Assessment does not include the cellular processes involved in the feedback mechanism.]
- HS-LS1-6. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules. [Clarification Statement: Emphasis is on using evidence from models and simulations to support explanations.] [Assessment Boundary: Assessment does not include the details of the specific chemical reactions or identification of macromolecules.]
- HS-LS1-7. Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy. [Clarification Statement: Emphasis is on the conceptual understanding of the inputs and outputs of the process of cellular respiration.] [Assessment Boundary: Assessment should not include identification of the steps or specific processes involved in cellular respiration.]
- 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.WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

| <p align="center">Enduring Understandings</p> <p align="center">Generalizations of desired understanding via essential questions (Students will understand that ...)</p> | <p align="center">Essential Questions</p> <p align="center">Inquiry used to explore generalizations</p> |
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| <ul style="list-style-type: none"> ● 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 | <ul style="list-style-type: none"> ● How do the structures of organisms enable life’s function? ● How do organisms obtain and use the matter and energy they need to live and grow? ● What are the physiological mechanisms that allow organ systems to function? |

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| <p>(through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3)</p> <ul style="list-style-type: none"> ● As a result of these chemical reactions, energy is transferred from one system of interacting molecules to another. Cellular respiration is a chemical process in which the bonds of food molecules and oxygen molecules are broken and new compounds are formed that can transport energy to muscles. Cellular respiration also releases the energy needed to maintain body temperature despite ongoing energy transfer to the surrounding environment. (HS-LS1-7) | |
| <p>Expected Performances What students should know and be able to do</p> | |
| <p>Students will know the following:</p> <ul style="list-style-type: none"> ● The chemical and physical mechanisms of digestion, elimination, transportation and absorption within the body to change food and derive energy ● The relationship between the respiratory and cardiovascular systems as they obtain oxygen needed for the oxidation of nutrients and removal of carbon dioxide ● The role of the urinary system to regulate body wastes ● Conditions that change normal body functions and how the body responds <p>Students will be able to do the following:</p> <ul style="list-style-type: none"> ● Apply concepts to how the body makes the nutrients in food available for utilization by the cells. ● Analyze how the respiratory system extracts oxygen from the atmosphere and gives off waste gases from the body so that the body can adjust to different levels of activity. ● Analyze how the kidneys help maintain the internal environment under varied conditions. | |
| <p>Character Attributes</p> | |
| <ul style="list-style-type: none"> ● Citizenship ● Respect ● Responsibility ● Compassion | |

| Technology Competencies | |
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| <ul style="list-style-type: none"> Students use technology to research, communicate, collaborate and solve an authentic problem. | |
| Develop Teaching and Learning Plan | |
| Teaching Strategies: <ul style="list-style-type: none"> Use gradual release model PowerPoint presentations and notes Laboratory investigations Case Study Investigations Cooperative grouping Audio Visual presentations Research Nonlinguistic representations | Learning Activities: <ul style="list-style-type: none"> Identify the organs of digestive and respiratory systems. Measuring Respiratory Volumes POGIL activities (using models) Case Study Analysis Cat Dissection |

| Assessments | |
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| Performance Task(s) | Other Evidence |
| Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period) | Application that is functional in a classroom context to evaluate student achievement of desired results |
| <p>Goal: Create a digestion apron that illustrates the digestive process from mouth to anus</p> <p>Role: Wear the apron</p> <p>Audience: Students</p> <p>Situation: Follow food and label the digestive process from beginning to end</p> <p>Product or Performance: the hand drawn apron</p> <p>Standards for Success: complete and accurate</p> | <ul style="list-style-type: none"> Formative quizzes Summative unit assessments Lab Reports Case Study notes Poster and Presentation of case study results |

| Suggested Resources |
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| <ul style="list-style-type: none"> Hole, John W, David Shier, Jackie Butler, and Ricki Lewis. <i>Hole's Essentials of Human Anatomy & Physiology</i>. Boston. Mass: WCB/McGraw-Hill, 2003. Print. |

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| <p>Committee Member(s): Karen Terhaar Robin Barboza-Josephson</p> <p>Unit Title: Unit 4 - The Human Life Cycle</p> | <p>Course/Subject: Honors Anatomy & Physiology II</p> <p>Grade Level: 11 - 12 # of Weeks: 3</p> |
| Identify Desired Results | |
| Common Core Standards | |
| <ul style="list-style-type: none"> ● HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. [Assessment Boundary: Assessment does not include the phases of meiosis or the biochemical mechanism of specific steps in the process.] ● 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 <i>grades 11-12 texts and topics</i>. ● CCSS.ELA-LITERACY.WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research. | |
| <p>Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that ...)</p> | <p>Essential Questions Inquiry used to explore generalizations</p> |
| <ul style="list-style-type: none"> ● In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. (HS-LS3-2) ● 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. (HS-LS1-3) | <ul style="list-style-type: none"> ● How do the structures of organisms enable life's function? ● How do organisms grow and develop? ● What are the physiological mechanisms that allow organ systems to function? |

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| <ul style="list-style-type: none"> • | |
| Expected Performances | |
| What students should know and be able to do | |
| <p>Students will know the following:</p> <ul style="list-style-type: none"> • The how the functions of the reproductive organs are regulated by hormonal interactions • The stages of human embryology and gestation <p>Students will be able to do the following:</p> <ul style="list-style-type: none"> • Critique how the male and female reproductive systems differ and complement each other. | |
| Character Attributes | |
| <ul style="list-style-type: none"> • Citizenship • Respect • Responsibility • Compassion | |
| Technology Competencies | |
| <ul style="list-style-type: none"> • Students use technology to research, communicate, collaborate and solve an authentic problem. | |
| Develop Teaching and Learning Plan | |
| <p>Teaching Strategies:</p> <ul style="list-style-type: none"> • Use gradual release model • PowerPoint presentations and notes • Laboratory investigations • Case Study Investigations • Cooperative grouping • Audio Visual presentations • Research • Nonlinguistic representations | <p>Learning Activities:</p> <ul style="list-style-type: none"> • POGIL activity (using models) • Case study analysis • Labeling Diagrams • Cat dissection |

| Assessments | |
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| Performance Task(s) | Other Evidence |
| Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period) | Application that is functional in a classroom context to evaluate student achievement of desired results |
| <p>Goal: Create a visual display representing the major stages and</p> | <ul style="list-style-type: none"> • Formative quizzes • Summative unit assessments • Lab Reports • Case Study notes • Poster and Presentation of case |

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| <p>events of the human reproductive life cycle</p> <p>Role: Story told from perspective of sperm cell, hormone, or baby, etc.</p> <p>Audience: Students</p> <p>Situation: Presentation of the following stages/events - fertilization, mitosis/differentiation, development, puberty, meiosis</p> <p>Product or Performance: Storyboard</p> <p>Standards for Success: Rubric based on explanation of stages, use of vocabulary, sequence and flow of stages, appearance, creativity, effort</p> | <p>study results</p> |
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Suggested Resources

- Hole, John W, David Shier, Jackie Butler, and Ricki Lewis. *Hole's Essentials of Human Anatomy & Physiology*. Boston. Mass: WCB/McGraw-Hill, 2003. Print.