

Main Criteria: Cogent Education's Interactive Cases
Secondary Criteria: Indiana Academic Standards
Subject: Science
Grades: 9, 10, 11, 12



Title	Common Among States	Indiana Academic Standards	Indiana Academic Standards	Indiana Academic Standards	Indiana Academic Standards
Action Potential -	IN	<p>IN.B. - Biology I - Process Standards PS.1. - The Nature of Science: Scientific knowledge is scientists' best explanations for the data from many investigations. Ideas about objects in the microscopic world that we cannot directly sense are often understood in terms of concepts developed to understand objects in the macroscopic world that we can see and touch. Student work should align with this process of science and should be guided by those principles. Students should also understand that scientific knowledge is gained from observation of natural phenomena and experimentation by designing and conducting investigations guided by theory and by evaluating and communicating the results of those investigations according to accepted procedures. These concepts should be woven throughout daily work. PS.1.1. - Develop explanations based on reproducible data and observations gathered during laboratory investigations. PS.1.2. - Recognize that their explanations must be based both on their data and other known information from investigations of others. PS.1.6. - Use analogies and models (mathematical and physical) to simplify and represent systems that are difficult to understand or directly experience due to their size, time scale or complexity. Recognize the limitations of analogies and models. PS.1.7. - Focus on the development of explanatory models based on their observations during laboratory investigations. B.1. - Cellular Chemistry B.1.2. - Understand that the shape of a molecule determines its role in the many different types of cellular processes (e.g., metabolism, homeostasis, growth and development, and heredity) and understand that the majority of these processes involve proteins that act as enzymes. B.2. - Cellular Structure B.2.1. - Describe features common to all cells that are essential for growth and survival. Explain their functions. B.2.2. - Describe the structure of a cell membrane and explain how it regulates the transport of materials into and out of the cell and prevents harmful materials from entering the cell. B.2.6. - Investigate a variety of different cell types and relate the proportion of different organelles within these cells to their functions. IN.9-10.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences 9-10.LST.1.1. - Read and comprehend science and technical texts within a range of complexity appropriate for grades 9-10 independently and proficiently by the end of grade 10. IN.9-10.LST.2. - KEY IDEAS AND TEXTUAL SUPPORT (READING): Extract and construct meaning from science and technical texts using a variety of comprehension skills</p>	<p>IN.B. - Biology I - Process Standards PS.1. - The Nature of Science: Scientific knowledge is scientists' best explanations for the data from many investigations. Ideas about objects in the microscopic world that we cannot directly sense are often understood in terms of concepts developed to understand objects in the macroscopic world that we can see and touch. Student work should align with this process of science and should be guided by those principles. Students should also understand that scientific knowledge is gained from observation of natural phenomena and experimentation by designing and conducting investigations guided by theory and by evaluating and communicating the results of those investigations according to accepted procedures. These concepts should be woven throughout daily work. 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AP.2. - Levels of Organization in the Human Body: Tissue and Organs AP.2.1. - Explain the interactions that exist among cells within multicellular organisms to produce tissues and organs with distinct functions. AP.2.2. - Compare and contrast the structure, function and location of cells that make up the various types of muscle tissue, nerve tissue and connective tissue. AP.2.3. - Describe the general cellular structure of an epithelium, including the basement membrane. Describe the different types and locations of epithelia. AP.2.5. - Describe the body cavities, their membranes, and the organs within each cavity and their role in the functioning of the body. Describe the major organ systems and their role in the functioning of the body. AP.6. - Integration and Coordination in the Human Body: The Nervous System AP.6.1. - Distinguish the structures of the various types of neurons. Diagram the structure of a motor neuron and explain the function of each of its parts.</p>	<p>IN.AP. - Anatomy and Physiology - Process Standards PS.1. - The Nature of Science: Scientific knowledge is scientists' best explanations for the data from many investigations. Ideas about objects in the microscopic world that we cannot directly sense are often understood in terms of concepts developed to understand objects in the macroscopic world that we can see and touch. Student work should align with this process of science and should be guided by those principles. Students should also understand that scientific knowledge is gained from observation of natural phenomena and experimentation by designing and conducting investigations guided by theory and by evaluating and communicating the results of those investigations according to accepted procedures. These concepts should be woven throughout daily work. 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		<p>9-10.LST.2.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>9-10.LST.2.2. - Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate, objective summary of the text.</p> <p>IN.9-10.LST.3. - STRUCTURAL ELEMENTS AND ORGANIZATION (READING): Build understanding of science and technical texts, using knowledge of structural organization and author's purpose and message</p> <p>9-10.LST.3.2. - Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).</p> <p>IN.9-10.LST.4. - SYNTHESIS AND CONNECTION OF IDEAS (READING): Build understanding of science and technical texts by synthesizing and connecting ideas and evaluating specific claims</p> <p>9-10.LST.4.3. - Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.</p> <p>IN.9-10.LST.5. - WRITING GENRES (WRITING): Write for different purposes and to specific audiences or people</p> <p>9-10.LST.5.1. - Write arguments focused on discipline-specific content.</p> <p>9-10.LST.5.2. - Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.</p>	<p>9-10.LST.2.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>9-10.LST.2.2. - Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate, objective summary of the text.</p> <p>IN.9-10.LST.3. - STRUCTURAL ELEMENTS AND ORGANIZATION (READING): Build understanding of science and technical texts, using knowledge of structural organization and author's purpose and message</p> <p>9-10.LST.3.2. - Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).</p> <p>IN.9-10.LST.4. - SYNTHESIS AND CONNECTION OF IDEAS (READING): Build understanding of science and technical texts by synthesizing and connecting ideas and evaluating specific claims</p> <p>9-10.LST.4.3. - Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.</p> <p>IN.9-10.LST.5. - WRITING GENRES (WRITING): Write for different purposes and to specific audiences or people</p> <p>9-10.LST.5.1. - Write arguments focused on discipline-specific content.</p> <p>9-10.LST.5.2. - Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.</p>	<p>AP.6.2. - Describe the different types of neuroglia. Describe the function of oligodendrocytes and Schwann cells. Describe the structure and function of the myelin sheath and the role that Schwann cells play in myelin and in regeneration of a severed axon.</p> <p>AP.6.3. - Discuss mathematically the origin of the resting potential. Refer to transcellular gradients of sodium and potassium ions, the "permeability" of the plasma membrane to these ions, and the intracellular concentration of negatively-charged proteins.</p> <p>AP.6.4. - Explain the changes in membrane potential during the action potential and their relationship to the number of open channels for sodium and potassium ions.</p> <p>IN.11-12.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p> <p>11-12.LST.1.1. - Read and comprehend science and technical texts within a range of complexity appropriate for grades 11-CCR independently and proficiently by the end of grade 12.</p> <p>IN.11-12.LST.2. - KEY IDEAS AND TEXTUAL SUPPORT (READING): Extract and construct meaning from science and technical texts using a variety of comprehension skills</p> <p>11-12.LST.2.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p>11-12.LST.2.2. - 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.</p> <p>IN.11-12.LST.3. - STRUCTURAL ELEMENTS AND ORGANIZATION (READING): Build understanding of science and technical texts, using knowledge of structural organization and author's purpose and message</p> <p>11-12.LST.3.2. - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p>IN.11-12.LST.4. - SYNTHESIS AND CONNECTION OF IDEAS (READING): Build understanding of science and technical texts by synthesizing and connecting ideas and evaluating specific claims</p> <p>11-12.LST.4.3. - 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.</p> <p>IN.11-12.LST.5. - WRITING GENRES (WRITING): Write for different purposes and to specific audiences or people</p> <p>11-12.LST.5.1. - Write arguments focused on discipline-specific content.</p> <p>11-12.LST.5.2. - Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.</p>	<p>AP.6.2. - Describe the different types of neuroglia. 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Refer to transcellular gradients of sodium and potassium ions, the "permeability" of the plasma membrane to these ions, and the intracellular concentration of negatively-charged proteins.</p> <p>AP.6.4. - Explain the changes in membrane potential during the action potential and their relationship to the number of open channels for sodium and potassium ions.</p> <p>IN.11-12.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p> <p>11-12.LST.1.1. - Read and comprehend science and technical texts within a range of complexity appropriate for grades 11-CCR independently and proficiently by the end of grade 12.</p> <p>IN.11-12.LST.2. - KEY IDEAS AND TEXTUAL SUPPORT (READING): Extract and construct meaning from science and technical texts using a variety of comprehension skills</p> <p>11-12.LST.2.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p>11-12.LST.2.2. - 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.</p> <p>IN.11-12.LST.3. - STRUCTURAL ELEMENTS AND ORGANIZATION (READING): Build understanding of science and technical texts, using knowledge of structural organization and author's purpose and message</p> <p>11-12.LST.3.2. - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p>IN.11-12.LST.4. - SYNTHESIS AND CONNECTION OF IDEAS (READING): Build understanding of science and technical texts by synthesizing and connecting ideas and evaluating specific claims</p> <p>11-12.LST.4.3. - 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.</p> <p>IN.11-12.LST.5. - WRITING GENRES (WRITING): Write for different purposes and to specific audiences or people</p> <p>11-12.LST.5.1. - Write arguments focused on discipline-specific content.</p> <p>11-12.LST.5.2. - Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.</p>
Cellular Respiration -	IN	IN.B. - Biology I - Process Standards	IN.B. - Biology I - Process Standards	IN.AP. - Anatomy and Physiology - Process Standards	IN.AP. - Anatomy and Physiology - Process Standards

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Recognize the limitations of analogies and models.</p> <p>PS.1.7. - Focus on the development of explanatory models based on their observations during laboratory investigations.</p> <p>B.1. - Cellular Chemistry</p> <p>B.1.1. - Describe the structure of the major categories of organic compounds that make up living organisms in terms of their building blocks and the small number of chemical elements (i.e., carbon, hydrogen, nitrogen, oxygen, phosphorous and sulfur) from which they are composed.</p> <p>B.1.2. - Understand that the shape of a molecule determines its role in the many different types of cellular processes (e.g., metabolism, homeostasis, growth and development, and heredity) and understand that the majority of these processes involve proteins that act as enzymes.</p> <p>B.2. - Cellular Structure</p> <p>B.2.2. - Describe the structure of a cell membrane and explain how it regulates the transport of materials into and out of the cell and prevents harmful materials from entering the cell.</p> <p>B.2.3. - Explain that most cells contain mitochondria (the key sites of cellular respiration), where stored chemical energy is converted into useable energy for the cell. Explain that some cells, including many plant cells, contain chloroplasts (the key sites of photosynthesis) where the energy of light is captured for use in chemical work.</p> <p>B.3. - Matter Cycles and Energy Transfer</p> <p>B.3.2. - Describe how most organisms can combine and recombine the elements contained in sugar molecules into a variety of biologically essential compounds by utilizing the energy from cellular respiration.</p> <p>B.3.4. - Describe how matter cycles through an ecosystem by way of food chains and food webs and how organisms convert that matter into a variety of organic molecules to be used in part in their own cellular structures.</p>	<p>PS.1. - The Nature of Science: Scientific knowledge is scientists' best explanations for the data from many investigations. Ideas about objects in the microscopic world that we cannot directly sense are often understood in terms of concepts developed to understand objects in the macroscopic world that we can see and touch. 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Describe the different types and locations of epithelia.</p> <p>AP.2.5. - Describe the body cavities, their membranes, and the organs within each cavity and their role in the functioning of the body. Describe the major organ systems and their role in the functioning of the body.</p> <p>AP.12. - Absorption and Excretion in the Human Body: The Digestive System</p> <p>AP.12.1. - Describe the functions of all the structural components and enzymes of the gastrointestinal tract and accessory organs in relation to the processing, digesting, and absorbing of the three major food classes.</p>	<p>PS.1. - The Nature of Science: Scientific knowledge is scientists' best explanations for the data from many investigations. Ideas about objects in the microscopic world that we cannot directly sense are often understood in terms of concepts developed to understand objects in the macroscopic world that we can see and touch. 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summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p>IN.11-12.LST.3. - STRUCTURAL ELEMENTS AND ORGANIZATION (READING): Build understanding of science and technical texts, using knowledge of structural organization and author's purpose and message</p> <p>11-12.LST.3.2. - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p>IN.11-12.LST.4. - SYNTHESIS AND CONNECTION OF IDEAS (READING): Build understanding of science and technical texts by synthesizing and connecting ideas and evaluating specific claims</p> <p>11-12.LST.4.3. - 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.</p> <p>IN.11-12.LST.5. - WRITING GENRES (WRITING): Write for different purposes and to specific audiences or people</p> <p>11-12.LST.5.1. - Write arguments focused on discipline-specific content.</p> <p>11-12.LST.5.2. - Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.</p>	<p>IN.11-12.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p> <p>11-12.LST.1.1. - Read and comprehend science and technical texts within a range of complexity appropriate for grades 11-CCR independently and proficiently by the end of grade 12.</p> <p>IN.11-12.LST.2. - KEY IDEAS AND TEXTUAL SUPPORT (READING): Extract and construct meaning from science and technical texts using a variety of comprehension skills</p> <p>11-12.LST.2.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p>11-12.LST.2.2. - Determine the central ideas or conclusions of a text; 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Recognize the limitations of analogies and models.</p> <p>PS.1.7. - Focus on the development of explanatory models based on their observations during laboratory investigations.</p> <p>B.1. - Cellular Chemistry</p> <p>B.1.1. - Describe the structure of the major categories of organic compounds that make up living organisms in terms of their building blocks and the small number of chemical elements (i.e., carbon, hydrogen, nitrogen, oxygen, phosphorous and sulfur) from which they are composed.</p> <p>B.1.2. - Understand that the shape of a molecule determines its role in the many different types of cellular processes (e.g., metabolism, homeostasis, growth and development, and heredity) and understand that the majority of these processes involve proteins that act as enzymes.</p> <p>B.1.3. - Explain and give examples of how the function and differentiation of cells is influenced by their external environment (e.g., temperature, acidity and the concentration of certain molecules) and changes in these conditions may affect how a cell functions.</p> <p>B.2. - Cellular Structure</p> <p>B.2.1. - Describe features common to all cells that are essential for growth and survival. Explain their functions.</p> <p>B.2.2. - Describe the structure of a cell membrane and explain how it regulates the transport of materials into and out of the cell and prevents harmful materials from entering the cell.</p> <p>B.2.5. - Explain that cells use proteins to form structures (e.g., cilia, flagella), which allow them to carry out specific functions (e.g., movement, adhesion and absorption).</p> <p>IN.9-10.LST.2. - KEY IDEAS AND TEXTUAL SUPPORT (READING): Extract and construct meaning from science and technical texts using a variety of comprehension skills</p> <p>9-10.LST.2.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>IN.9-10.LST.5. - WRITING GENRES (WRITING): Write for different purposes and to specific audiences or people</p> <p>9-10.LST.5.1. - Write arguments focused on discipline-specific content.</p> <p>9-10.LST.5.2. - Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.</p>	<p>PS.1.6. - Use analogies and models (mathematical and physical) to simplify and represent systems that are difficult to understand or directly experience due to their size, time scale or complexity. 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Describe the different types and locations of epithelia.</p> <p>AP.2.5. - Describe the body cavities, their membranes, and the organs within each cavity and their role in the functioning of the body. Describe the major organ systems and their role in the functioning of the body.</p> <p>AP.12. - Absorption and Excretion in the Human Body: The Digestive System</p> <p>AP.12.1. - Describe the functions of all the structural components and enzymes of the gastrointestinal tract and accessory organs in relation to the processing, digesting, and absorbing of the three major food classes.</p> <p>AP.14. - Absorption and Excretion in the Human Body: The Urinary System</p> <p>AP.14.2. - Explain the importance of the juxtaglomerular cells in the secretion of renin and how it plays a central role in controlling blood pressure by controlling blood levels of angiotensin and aldosterone.</p>	<p>PS.1. - The Nature of Science: Scientific knowledge is scientists' best explanations for the data from many investigations. 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These concepts should be woven throughout daily work.</p> <p>PS.1.1. - Develop explanations based on reproducible data and observations gathered during laboratory investigations.</p> <p>PS.1.2. - Recognize that their explanations must be based both on their data and other known information from investigations of others.</p> <p>PS.1.3. - Clearly communicate their ideas and results of investigations verbally and in written form using tables, graphs, diagrams and photographs.</p> <p>PS.1.6. - Use analogies and models (mathematical and physical) to simplify and represent systems that are difficult to understand or directly experience due to their size, time scale or complexity. Recognize the limitations of analogies and models.</p> <p>PS.1.7. - Focus on the development of explanatory models based on their observations during laboratory investigations.</p> <p>AP.1. - Levels of Organization in the Human Body: Cellular</p> <p>AP.1.1. - Compare and contrast diffusion and osmosis, facilitated diffusion, active transport, endocytosis, and exocytosis.</p> <p>AP.1.2. - Define homeostasis, its principal mechanisms at the cellular level and the consequences of failure to maintain homeostasis.</p> <p>AP.2. - Levels of Organization in the Human Body: Tissue and Organs</p> <p>AP.2.1. - Explain the interactions that exist among cells within multicellular organisms to produce tissues and organs with distinct functions.</p> <p>AP.2.3. - Describe the general cellular structure of an epithelium, including the basement membrane. Describe the different types and locations of epithelia.</p> <p>AP.2.5. - Describe the body cavities, their membranes, and the organs within each cavity and their role in the functioning of the body. Describe the major organ systems and their role in the functioning of the body.</p> <p>AP.12. - Absorption and Excretion in the Human Body: The Digestive System</p> <p>AP.12.1. - Describe the functions of all the structural components and enzymes of the gastrointestinal tract and accessory organs in relation to the processing, digesting, and absorbing of the three major food classes.</p> <p>AP.14. - Absorption and Excretion in the Human Body: The Urinary System</p> <p>AP.14.2. - Explain the importance of the juxtaglomerular cells in the secretion of renin and how it plays a central role in controlling blood pressure by controlling blood levels of angiotensin and aldosterone.</p>
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IN.9-10.LST.5. - WRITING GENRES (WRITING): Write for different purposes and to specific audiences or people</p> <p>9-10.LST.5.1. - Write arguments focused on discipline-specific content.</p> <p>9-10.LST.5.2. - Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.</p>	<p>AP.14.3. - Explain the neural basis of micturition including the function of the sphincters associated with the male and female urethra.</p> <p>AP.14.4. - Discuss how the volume of body fluid is determined by the balance between ingested and metabolic water on the one hand and water lost in the urine, respiration, feces and sweating on the other hand.</p> <p>AP.14.6. - Describe how food and metabolic processes add acid to the body fluids. Recognize how chemical buffers, the lungs and the kidneys interact in protecting the body against lethal changes of pH.</p> <p>IN.11-12.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p> <p>11-12.LST.1.1. - Read and comprehend science and technical texts within a range of complexity appropriate for grades 11-CCR independently and proficiently by the end of grade 12.</p> <p>IN.11-12.LST.2. - KEY IDEAS AND TEXTUAL SUPPORT (READING): Extract and construct meaning from science and technical texts using a variety of comprehension skills</p> <p>11-12.LST.2.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p>11-12.LST.2.2. - 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.</p> <p>IN.11-12.LST.3. - STRUCTURAL ELEMENTS AND ORGANIZATION (READING): Build understanding of science and technical texts, using knowledge of structural organization and author's purpose and message</p> <p>11-12.LST.3.2. - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p>IN.11-12.LST.4. - SYNTHESIS AND CONNECTION OF IDEAS (READING): Build understanding of science and technical texts by synthesizing and connecting ideas and evaluating specific claims</p> <p>11-12.LST.4.3. - 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.</p> <p>IN.11-12.LST.5. - WRITING GENRES (WRITING): Write for different purposes and to specific audiences or people</p> <p>11-12.LST.5.1. - Write arguments focused on discipline-specific content.</p> <p>11-12.LST.5.2. - Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.</p>	<p>AP.14.3. - Explain the neural basis of micturition including the function of the sphincters associated with the male and female urethra.</p> <p>AP.14.4. - Discuss how the volume of body fluid is determined by the balance between ingested and metabolic water on the one hand and water lost in the urine, respiration, feces and sweating on the other hand.</p> <p>AP.14.6. - Describe how food and metabolic processes add acid to the body fluids. 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Membrane Potential -	IN	IN.B. - Biology I - Process Standards	IN.B. - Biology I - Process Standards	IN.AP. - Anatomy and Physiology - Process Standards	IN.AP. - Anatomy and Physiology - Process Standards

<p>PS.1. - The Nature of Science: Scientific knowledge is scientists' best explanations for the data from many investigations. Ideas about objects in the microscopic world that we cannot directly sense are often understood in terms of concepts developed to understand objects in the macroscopic world that we can see and touch. Student work should align with this process of science and should be guided by those principles. Students should also understand that scientific knowledge is gained from observation of natural phenomena and experimentation by designing and conducting investigations guided by theory and by evaluating and communicating the results of those investigations according to accepted procedures. These concepts should be woven throughout daily work.</p> <p>PS.1.1. - Develop explanations based on reproducible data and observations gathered during laboratory investigations.</p> <p>PS.1.2. - Recognize that their explanations must be based both on their data and other known information from investigations of others.</p> <p>PS.1.6. - Use analogies and models (mathematical and physical) to simplify and represent systems that are difficult to understand or directly experience due to their size, time scale or complexity. Recognize the limitations of analogies and models.</p> <p>PS.1.7. - Focus on the development of explanatory models based on their observations during laboratory investigations.</p> <p>B.1. - Cellular Chemistry</p> <p>B.1.2. - Understand that the shape of a molecule determines its role in the many different types of cellular processes (e.g., metabolism, homeostasis, growth and development, and heredity) and understand that the majority of these processes involve proteins that act as enzymes.</p> <p>B.2. - Cellular Structure</p> <p>B.2.2. - Describe the structure of a cell membrane and explain how it regulates the transport of materials into and out of the cell and prevents harmful materials from entering the cell.</p> <p>B.2.6. - Investigate a variety of different cell types and relate the proportion of different organelles within these cells to their functions.</p> <p>IN.9-10.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p> <p>9-10.LST.1.1. - Read and comprehend science and technical texts within a range of complexity appropriate for grades 9-10 independently and proficiently by the end of grade 10.</p> <p>IN.9-10.LST.2. - KEY IDEAS AND TEXTUAL SUPPORT (READING): Extract and construct meaning from science and technical texts using a variety of comprehension skills</p> <p>9-10.LST.2.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>9-10.LST.2.2. - Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate, objective summary of the text.</p> <p>IN.9-10.LST.3. - STRUCTURAL ELEMENTS AND ORGANIZATION (READING): Build understanding of science and technical texts, using knowledge of structural organization and author's purpose and message</p>	<p>PS.1. - The Nature of Science: Scientific knowledge is scientists' best explanations for the data from many investigations. 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Describe the different types and locations of epithelia.</p> <p>AP.2.5. - Describe the body cavities, their membranes, and the organs within each cavity and their role in the functioning of the body. Describe the major organ systems and their role in the functioning of the body.</p> <p>AP.6. - Integration and Coordination in the Human Body: The Nervous System</p> <p>AP.6.1. - Distinguish the structures of the various types of neurons. Diagram the structure of a motor neuron and explain the function of each of its parts.</p> <p>AP.6.2. - Describe the different types of neuroglia. Describe the function of oligodendrocytes and Schwann cells. Describe the structure and function of the myelin sheath and the role that Schwann cells play in myelin and in regeneration of a severed axon.</p> <p>AP.6.3. - Discuss mathematically the origin of the resting potential. Refer to transcellular gradients of sodium and potassium ions, the "permeability" of the plasma membrane to these ions, and the intracellular concentration of negatively-charged proteins.</p>	<p>PS.1. - The Nature of Science: Scientific knowledge is scientists' best explanations for the data from many investigations. Ideas about objects in the microscopic world that we cannot directly sense are often understood in terms of concepts developed to understand objects in the macroscopic world that we can see and touch. Student work should align with this process of science and should be guided by those principles. Students should also understand that scientific knowledge is gained from observation of natural phenomena and experimentation by designing and conducting investigations guided by theory and by evaluating and communicating the results of those investigations according to accepted procedures. 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		<p>9-10.LST.3.2. - Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy). IN.9-10.LST.4. - SYNTHESIS AND CONNECTION OF IDEAS (READING): Build understanding of science and technical texts by synthesizing and connecting ideas and evaluating specific claims</p> <p>9-10.LST.4.3. - Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. 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Recognize the limitations of analogies and models.</p> <p>PS.1.7. - Focus on the development of explanatory models based on their observations during laboratory investigations.</p> <p>B.1. - Cellular Chemistry</p> <p>B.1.1. - Describe the structure of the major categories of organic compounds that make up living organisms in terms of their building blocks and the small number of chemical elements (i.e., carbon, hydrogen, nitrogen, oxygen, phosphorous and sulfur) from which they are composed.</p> <p>B.1.2. - Understand that the shape of a molecule determines its role in the many different types of cellular processes (e.g., metabolism, homeostasis, growth and development, and heredity) and understand that the majority of these processes involve proteins that act as enzymes.</p> <p>B.2. - Cellular Structure</p> <p>B.2.1. - Describe features common to all cells that are essential for growth and survival. Explain their functions.</p> <p>B.2.2. - Describe the structure of a cell membrane and explain how it regulates the transport of materials into and out of the cell and prevents harmful materials from entering the cell.</p> <p>B.2.6. - Investigate a variety of different cell types and relate the proportion of different organelles within these cells to their functions.</p> <p>IN.9-10.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p> <p>9-10.LST.1.1. - Read and comprehend science and technical texts within a range of complexity appropriate for grades 9-10 independently and proficiently by the end of grade 10.</p> <p>IN.9-10.LST.2. - KEY IDEAS AND TEXTUAL SUPPORT (READING): Extract and construct meaning from science and technical texts using a variety of comprehension skills</p> <p>9-10.LST.2.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>9-10.LST.2.2. - Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate, objective summary of the text.</p> <p>IN.9-10.LST.3. - STRUCTURAL ELEMENTS AND ORGANIZATION (READING): Build understanding of science and technical texts, using knowledge of structural organization and author's purpose and message</p> <p>9-10.LST.3.2. - Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).</p>	<p>PS.1.2. - Recognize that their explanations must be based both on their data and other known information from investigations of others.</p> <p>PS.1.6. - Use analogies and models (mathematical and physical) to simplify and represent systems that are difficult to understand or directly experience due to their size, time scale or complexity. 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Describe the different types and locations of epithelia.</p> <p>AP.2.5. - Describe the body cavities, their membranes, and the organs within each cavity and their role in the functioning of the body. Describe the major organ systems and their role in the functioning of the body.</p> <p>AP.6. - Integration and Coordination in the Human Body: The Nervous System</p> <p>AP.6.1. - Distinguish the structures of the various types of neurons. Diagram the structure of a motor neuron and explain the function of each of its parts.</p> <p>AP.6.2. - Describe the different types of neuroglia. Describe the function of oligodendrocytes and Schwann cells. Describe the structure and function of the myelin sheath and the role that Schwann cells play in myelin and in regeneration of a severed axon.</p> <p>AP.6.3. - Discuss mathematically the origin of the resting potential. Refer to transcellular gradients of sodium and potassium ions, the "permeability" of the plasma membrane to these ions, and the intracellular concentration of negatively-charged proteins.</p> <p>AP.6.4. - Explain the changes in membrane potential during the action potential and their relationship to the number of open channels for sodium and potassium ions.</p> <p>IN.11-12.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p> <p>11-12.LST.1.1. - Read and comprehend science and technical texts within a range of complexity appropriate for grades 11-CCR independently and proficiently by the end of grade 12.</p>	<p>PS.1.2. - Recognize that their explanations must be based both on their data and other known information from investigations of others.</p> <p>PS.1.6. - Use analogies and models (mathematical and physical) to simplify and represent systems that are difficult to understand or directly experience due to their size, time scale or complexity. 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<p>PS.1.6. - Use analogies and models (mathematical and physical) to simplify and represent systems that are difficult to understand or directly experience due to their size, time scale or complexity. Recognize the limitations of analogies and models.</p> <p>PS.1.7. - Focus on the development of explanatory models based on their observations during laboratory investigations.</p> <p>B.1. - Cellular Chemistry</p> <p>B.1.1. - Describe the structure of the major categories of organic compounds that make up living organisms in terms of their building blocks and the small number of chemical elements (i.e., carbon, hydrogen, nitrogen, oxygen, phosphorous and sulfur) from which they are composed.</p> <p>B.1.2. - Understand that the shape of a molecule determines its role in the many different types of cellular processes (e.g., metabolism, homeostasis, growth and development, and heredity) and understand that the majority of these processes involve proteins that act as enzymes.</p> <p>B.2. - Cellular Structure</p> <p>B.2.1. - Describe features common to all cells that are essential for growth and survival. Explain their functions.</p> <p>B.2.2. - Describe the structure of a cell membrane and explain how it regulates the transport of materials into and out of the cell and prevents harmful materials from entering the cell.</p> <p>B.2.3. - Explain that most cells contain mitochondria (the key sites of cellular respiration), where stored chemical energy is converted into useable energy for the cell. Explain that some cells, including many plant cells, contain chloroplasts (the key sites of photosynthesis) where the energy of light is captured for use in chemical work.</p> <p>B.3. - Matter Cycles and Energy Transfer</p> <p>B.3.1. - Describe how some organisms capture the sun's energy through the process of photosynthesis by converting carbon dioxide and water into high-energy compounds and releasing oxygen.</p> <p>B.3.2. - Describe how most organisms can combine and recombine the elements contained in sugar molecules into a variety of biologically essential compounds by utilizing the energy from cellular respiration.</p> <p>B.3.3. - Recognize and describe that metabolism consists of all of the biochemical reactions that occur inside cells, which include the production, modification, transport, and exchange of materials that are required for the maintenance of life.</p> <p>B.3.4. - Describe how matter cycles through an ecosystem by way of food chains and food webs and how organisms convert that matter into a variety of organic molecules to be used in part in their own cellular structures.</p> <p>B.4. - Interdependence</p> <p>B.4.2. - Describe how human activities and natural phenomena can change the flow and of matter and energy in an ecosystem and how those changes impact other species.</p> <p>IN.9-10.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p>	<p>PS.1.6. - Use analogies and models (mathematical and physical) to simplify and represent systems that are difficult to understand or directly experience due to their size, time scale or complexity. 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Explain their functions.</p> <p>B.2.2. - Describe the structure of a cell membrane and explain how it regulates the transport of materials into and out of the cell and prevents harmful materials from entering the cell.</p> <p>B.2.3. - Explain that most cells contain mitochondria (the key sites of cellular respiration), where stored chemical energy is converted into useable energy for the cell. Explain that some cells, including many plant cells, contain chloroplasts (the key sites of photosynthesis) where the energy of light is captured for use in chemical work.</p> <p>B.3. - Matter Cycles and Energy Transfer</p> <p>B.3.1. - Describe how some organisms capture the sun's energy through the process of photosynthesis by converting carbon dioxide and water into high-energy compounds and releasing oxygen.</p> <p>B.3.2. - Describe how most organisms can combine and recombine the elements contained in sugar molecules into a variety of biologically essential compounds by utilizing the energy from cellular respiration.</p> <p>B.3.3. - Recognize and describe that metabolism consists of all of the biochemical reactions that occur inside cells, which include the production, modification, transport, and exchange of materials that are required for the maintenance of life.</p> <p>B.3.4. - Describe how matter cycles through an ecosystem by way of food chains and food webs and how organisms convert that matter into a variety of organic molecules to be used in part in their own cellular structures.</p> <p>B.4. - Interdependence</p> <p>B.4.2. - Describe how human activities and natural phenomena can change the flow and of matter and energy in an ecosystem and how those changes impact other species.</p> <p>IN.9-10.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p>	<p>PS.1.6. - Use analogies and models (mathematical and physical) to simplify and represent systems that are difficult to understand or directly experience due to their size, time scale or complexity. 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Synaptic Transmission - IN	IN	<p>IN.B. - Biology I</p> <p>- Process Standards</p> <p>PS.1. - The Nature of Science: Scientific knowledge is scientists' best explanations for the data from many investigations. Ideas about objects in the microscopic world that we cannot directly sense are often understood in terms of concepts developed to understand objects in the macroscopic world that we can see and touch. Student work should align with this process of science and should be guided by those principles. Students should also understand that scientific knowledge is gained from observation of natural phenomena and experimentation by designing and conducting investigations guided by theory and by evaluating and communicating the results of those investigations according to accepted procedures. These concepts should be woven throughout daily work.</p> <p>PS.1.1. - Develop explanations based on reproducible data and observations gathered during laboratory investigations.</p> <p>PS.1.2. - Recognize that their explanations must be based both on their data and other known information from investigations of others.</p> <p>PS.1.6. - Use analogies and models (mathematical and physical) to simplify and represent systems that are difficult to understand or directly experience due to their size, time scale or complexity. Recognize the limitations of analogies and models.</p> <p>PS.1.7. - Focus on the development of explanatory models based on their observations during laboratory investigations.</p> <p>B.1. - Cellular Chemistry</p>	<p>IN.B. - Biology I</p> <p>- Process Standards</p> <p>PS.1. - The Nature of Science: Scientific knowledge is scientists' best explanations for the data from many investigations. 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<p>B.1.2. - Understand that the shape of a molecule determines its role in the many different types of cellular processes (e.g., metabolism, homeostasis, growth and development, and heredity) and understand that the majority of these processes involve proteins that act as enzymes.</p> <p>B.2. - Cellular Structure</p>	<p>B.1.2. - Understand that the shape of a molecule determines its role in the many different types of cellular processes (e.g., metabolism, homeostasis, growth and development, and heredity) and understand that the majority of these processes involve proteins that act as enzymes.</p> <p>B.2. - Cellular Structure</p>	<p>AP.1.2. - Define homeostasis, its principal mechanisms at the cellular level and the consequences of failure to maintain homeostasis.</p>	<p>AP.1.2. - Define homeostasis, its principal mechanisms at the cellular level and the consequences of failure to maintain homeostasis.</p>
<p>B.2.1. - Describe features common to all cells that are essential for growth and survival. Explain their functions.</p>	<p>B.2.1. - Describe features common to all cells that are essential for growth and survival. Explain their functions.</p>	<p>AP.2. - Levels of Organization in the Human Body: Tissue and Organs</p> <p>AP.2.1. - Explain the interactions that exist among cells within multicellular organisms to produce tissues and organs with distinct functions.</p>	<p>AP.2. - Levels of Organization in the Human Body: Tissue and Organs</p> <p>AP.2.1. - Explain the interactions that exist among cells within multicellular organisms to produce tissues and organs with distinct functions.</p>
<p>B.2.2. - Describe the structure of a cell membrane and explain how it regulates the transport of materials into and out of the cell and prevents harmful materials from entering the cell.</p>	<p>B.2.2. - Describe the structure of a cell membrane and explain how it regulates the transport of materials into and out of the cell and prevents harmful materials from entering the cell.</p>	<p>AP.2.2. - Compare and contrast the structure, function and location of cells that make up the various types of muscle tissue, nerve tissue and connective tissue.</p>	<p>AP.2.2. - Compare and contrast the structure, function and location of cells that make up the various types of muscle tissue, nerve tissue and connective tissue.</p>
<p>B.2.6. - Investigate a variety of different cell types and relate the proportion of different organelles within these cells to their functions.</p> <p>IN.9-10.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p>	<p>B.2.6. - Investigate a variety of different cell types and relate the proportion of different organelles within these cells to their functions.</p> <p>IN.9-10.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p>	<p>AP.2.3. - Describe the general cellular structure of an epithelium, including the basement membrane. Describe the different types and locations of epithelia.</p> <p>AP.2.5. - Describe the body cavities, their membranes, and the organs within each cavity and their role in the functioning of the body. Describe the major organ systems and their role in the functioning of the body.</p>	<p>AP.2.3. - Describe the general cellular structure of an epithelium, including the basement membrane. Describe the different types and locations of epithelia.</p> <p>AP.2.5. - Describe the body cavities, their membranes, and the organs within each cavity and their role in the functioning of the body. Describe the major organ systems and their role in the functioning of the body.</p>
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<p>9-10.LST.2.2. - Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate, objective summary of the text.</p>	<p>9-10.LST.2.2. - Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate, objective summary of the text.</p>	<p>AP.6.3. - Discuss mathematically the origin of the resting potential. Refer to transcellular gradients of sodium and potassium ions, the "permeability" of the plasma membrane to these ions, and the intracellular concentration of negatively-charged proteins.</p>	<p>AP.6.3. - Discuss mathematically the origin of the resting potential. Refer to transcellular gradients of sodium and potassium ions, the "permeability" of the plasma membrane to these ions, and the intracellular concentration of negatively-charged proteins.</p>
<p>IN.9-10.LST.3. - STRUCTURAL ELEMENTS AND ORGANIZATION (READING): Build understanding of science and technical texts, using knowledge of structural organization and author's purpose and message</p> <p>9-10.LST.3.2. - Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).</p>	<p>IN.9-10.LST.3. - STRUCTURAL ELEMENTS AND ORGANIZATION (READING): Build understanding of science and technical texts, using knowledge of structural organization and author's purpose and message</p> <p>9-10.LST.3.2. - Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).</p>	<p>AP.6.4. - Explain the changes in membrane potential during the action potential and their relationship to the number of open channels for sodium and potassium ions.</p> <p>IN.11-12.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p>	<p>AP.6.4. - Explain the changes in membrane potential during the action potential and their relationship to the number of open channels for sodium and potassium ions.</p> <p>IN.11-12.LST.1. - LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS: Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences</p>
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