

**Main Criteria: Cogent Education's Interactive Cases**  
**Secondary Criteria: Missouri Grade and Course-Level Expectations**  
**Subject: Science**  
**Grades: 9, 10, 11, 12**



Title	Common Among States	Missouri Grade and Course-Level Expectations	Missouri Grade and Course-Level Expectations	Missouri Grade and Course-Level Expectations	Missouri Grade and Course-Level Expectations
Action Potential -	MO	<p>MO.B. - Biology I</p> <p>B.3. - Characteristic and Interactions of Living Organisms</p> <p>B.3.1. - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C. - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes</p> <p>B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds</p> <p>B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)</p> <p>B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction</p> <p>B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule</p> <p>B.3.2.E.b. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.a. - Explain the significance of the selectively permeable membrane to the transport of molecules</p> <p>B.7. - Scientific Inquiry</p> <p>B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a. - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c. - Design and conduct a valid experiment</p> <p>B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D. - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b. - Communicate and defend a scientific argument</p> <p>B.8. - Impact of Science, Technology and Human Activity</p> <p>B.8.3. - Science and technology affect, and are affected by, society</p> <p>B.8.3.C. - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c. - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.9-10. - Reading Standards for Literacy in Science and Technical Subjects</p> <p>Key Ideas and Details</p> <p>RST.9-10.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>RST.9-10.5. - 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>MO.B. - Biology I</p> <p>B.3. - Characteristic and Interactions of Living Organisms</p> <p>B.3.1. - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C. - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes</p> <p>B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds</p> <p>B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)</p> <p>B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction</p> <p>B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule</p> <p>B.3.2.E.b. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.a. - Explain the significance of the selectively permeable membrane to the transport of molecules</p> <p>B.7. - Scientific Inquiry</p> <p>B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a. - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c. - Design and conduct a valid experiment</p> <p>B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B. - 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		<p>RST.9-10.10. - By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10. - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1. - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2. - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(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).</p> <p>WHST.9-10.3. - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and WHST.9-10.4. - Produce clear and coherent writing in which the development, organization, and style are appropriate to</p>	<p>RST.9-10.10. - By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10. - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1. - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2. - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(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).</p> <p>WHST.9-10.3. - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. 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In science and WHST.9-10.4. - Produce clear and coherent writing in which the development, organization, and style are appropriate to</p>	<p>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.</p> <p>RST.11-12.10. - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12. - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1. - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.11-12.2. - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3. - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. 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In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4. - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>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.</p> <p>RST.11-12.10. - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12. - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1. - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.11-12.2. - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3. - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4. - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
Cellular Respiration	MO	<p>MO.B. - Biology I</p> <p>B.3. - Characteristic and Interactions of Living Organisms</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes</p> <p>B.3.2.B. - Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth</p> <p>B.3.2.B.a. - Explain the interrelationship between the processes of photosynthesis and cellular respiration (e.g., recycling of oxygen and carbon dioxide), comparing and contrasting photosynthesis and cellular respiration reactions (Do NOT assess intermediate reactions)</p> <p>B.3.2.B.b. - Determine what factors affect the processes of photosynthesis and cellular respiration (i.e., light intensity, availability of reactants, temperature)</p> <p>B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds</p> <p>B.3.2.D.b. - Relate the structure of organic compounds (e.g., proteins, nucleic acids, lipids, carbohydrates) to their role in living systems</p> <p>B.3.2.D.c. - Recognize energy is absorbed or released in the breakdown and/or synthesis of organic compounds</p> <p>B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)</p> <p>B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction</p> <p>B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule</p> <p>B.3.2.E.b. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p>	<p>MO.B. - Biology I</p> <p>B.3. - Characteristic and Interactions of Living Organisms</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes</p> <p>B.3.2.B. - Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth</p> <p>B.3.2.B.a. - Explain the interrelationship between the processes of photosynthesis and cellular respiration (e.g., recycling of oxygen and carbon dioxide), comparing and contrasting photosynthesis and cellular respiration reactions (Do NOT assess intermediate reactions)</p> <p>B.3.2.B.b. - 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<p>B.3.2.F.b. - Predict the movement of molecules across a selectively permeable membrane (i.e., diffusion, osmosis, active transport) needed for a cell to maintain homeostasis given concentration gradients and different sizes of molecules</p> <p><b>B.7. - Scientific Inquiry</b>        B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking        B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation        B.7.1.A.a. - Formulate testable questions and hypotheses        B.7.1.A.c. - Design and conduct a valid experiment        B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies        B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements        B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations        B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)        B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)        B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)        B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)        B.7.1.D. - The nature of science relies upon communication of results and justification of explanations        B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings        B.7.1.D.b. - Communicate and defend a scientific argument        B.8. - Impact of Science, Technology and Human Activity        B.8.3. - Science and technology affect, and are affected by, society        B.8.3.C. - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent        B.8.3.C.c. - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)        MO.RST.9-10. - Reading Standards for Literacy in Science and Technical Subjects        - Key Ideas and Details        RST.9-10.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.        RST.9-10.5. - Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).        RST.9-10.10. - By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.        MO.WHST.9-10. - Writing Standards for Literacy in Science and Technical Subjects        WHST.9-10.1. - Write arguments focused on discipline-specific content.        WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.        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WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p>	<p>B.3.2.F.b. - Predict the movement of molecules across a selectively permeable membrane (i.e., diffusion, osmosis, active transport) needed for a cell to maintain homeostasis given concentration gradients and different sizes of molecules</p> <p><b>B.7. - Scientific Inquiry</b>        B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking        B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation        B.7.1.A.a. - Formulate testable questions and hypotheses        B.7.1.A.c. - Design and conduct a valid experiment        B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies        B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements        B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations        B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)        B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)        B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)        B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)        B.7.1.D. - The nature of science relies upon communication of results and justification of explanations        B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings        B.7.1.D.b. - Communicate and defend a scientific argument        B.8. - Impact of Science, Technology and Human Activity        B.8.3. - Science and technology affect, and are affected by, society        B.8.3.C. - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent        B.8.3.C.c. - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)        MO.RST.11-12. - Reading Standards for Literacy in Science and Technical Subjects        - Key Ideas and Details        RST.11-12.1. - 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.        RST.11-12.5. - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.        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.        RST.11-12.10. - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.        MO.WHST.11-12. - Writing Standards for Literacy in Science and Technical Subjects        WHST.11-12.1. - Write arguments focused on discipline-specific content.        WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.        WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.        WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.        WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.        WHST.11-12.2. - Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.        WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.        WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p>
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Diffusion -	MO	<p>MO.B. - Biology I</p> <p>B.3. - Characteristic and Interactions of Living Organisms</p> <p>B.3.1. - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C. - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds</p> <p>B.3.2.D.b. - Relate the structure of organic compounds (e.g., proteins, nucleic acids, lipids, carbohydrates) to their role in living systems</p> <p>B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule</p> <p>B.3.2.E.b. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.b. - Predict the movement of molecules across a selectively permeable membrane (i.e., diffusion, osmosis, active transport) needed for a cell to maintain homeostasis given concentration gradients and different sizes of molecules</p> <p>B.3.2.F.c. - Explain how water is important to cells (e.g., is a buffer for body temperature, provides soluble environment for chemical reactions, serves as a reactant in chemical reactions, provides hydration that maintains cell turgidity, maintains protein shape)</p> <p>B.7. - Scientific Inquiry</p> <p>B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a. - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c. - Design and conduct a valid experiment</p> <p>B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D. - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a. - 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Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b. - Communicate and defend a scientific argument</p>

		<p>B.8 - Impact of Science, Technology and Human Activity</p> <p>B.8.3 - Science and technology affect, and are affected by, society</p> <p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.9-10 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.9-10.1 - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>MO.WHST.9-10 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(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).</p> <p>WHST.9-10.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and WHST.9-10.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>B.8 - Impact of Science, Technology and Human Activity</p> <p>B.8.3 - Science and technology affect, and are affected by, society</p> <p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.9-10 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.9-10.1 - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>MO.WHST.9-10 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(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).</p> <p>WHST.9-10.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and WHST.9-10.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>B.8 - Impact of Science, Technology and Human Activity</p> <p>B.8.3 - Science and technology affect, and are affected by, society</p> <p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.11-12 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.11-12.1 - 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>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.</p> <p>MO.WHST.11-12 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>B.8 - Impact of Science, Technology and Human Activity</p> <p>B.8.3 - Science and technology affect, and are affected by, society</p> <p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.11-12 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.11-12.1 - 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>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.</p> <p>MO.WHST.11-12 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
Filtration -	MO	<p>MO.B - Biology I</p> <p>B.3 - Characteristic and Interactions of Living Organisms</p> <p>B.3.1 - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2 - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.F - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.b - Predict the movement of molecules across a selectively permeable membrane (i.e., diffusion, osmosis, active transport) needed for a cell to maintain homeostasis given concentration gradients and different sizes of molecules</p>	<p>MO.B - Biology I</p> <p>B.3 - Characteristic and Interactions of Living Organisms</p> <p>B.3.1 - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2 - 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<p>B.7 - Scientific Inquiry</p> <p>B.7.1 - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c - Design and conduct a valid experiment</p> <p>B.7.1.A.e - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g - Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b - Communicate and defend a scientific argument</p> <p>B.8 - Impact of Science, Technology and Human Activity</p> <p>B.8.3 - Science and technology affect, and are affected by, society</p> <p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.9-10 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.9-10.1 - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>RST.9-10.5 - 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>RST.9-10.10 - By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(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).</p>	<p>B.7 - Scientific Inquiry</p> <p>B.7.1 - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A - 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By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(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).</p>	<p>B.7 - Scientific Inquiry</p> <p>B.7.1 - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c - Design and conduct a valid experiment</p> <p>B.7.1.A.e - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g - Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b - Communicate and defend a scientific argument</p> <p>B.8 - Impact of Science, Technology and Human Activity</p> <p>B.8.3 - Science and technology affect, and are affected by, society</p> <p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.11-12 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.11-12.1 - 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>RST.11-12.5 - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p>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.</p> <p>RST.11-12.10 - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.11-12.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - 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Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a - 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Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p>
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Membrane Potential	MO	<p>MO.B. - Biology I</p> <p>B.3. - Characteristic and Interactions of Living Organisms</p> <p>B.3.1. - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C. - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes</p> <p>B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds</p> <p>B.3.2.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)</p> <p>B.3.2.d.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction</p> <p>B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule</p> <p>B.3.2.E.b. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.a. - Explain the significance of the selectively permeable membrane to the transport of molecules</p> <p>B.7. - Scientific Inquiry</p> <p>B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a. - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c. - Design and conduct a valid experiment</p> <p>B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D. - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b. - 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Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes</p> <p>B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds</p> <p>B.3.2.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)</p> <p>B.3.2.d.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction</p> <p>B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule</p> <p>B.3.2.E.b. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.a. - Explain the significance of the selectively permeable membrane to the transport of molecules</p> <p>B.7. - Scientific Inquiry</p> <p>B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a. - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c. - Design and conduct a valid experiment</p> <p>B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g. - 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Impact of Science, Technology and Human Activity</p> <p>B.8.3. - Science and technology affect, and are affected by, society</p> <p>B.8.3.C. - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p>	<p>MO.B. - Biology I</p> <p>B.3. - Characteristic and Interactions of Living Organisms</p> <p>B.3.1. - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C. - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes</p> <p>B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds</p> <p>B.3.2.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)</p> <p>B.3.2.d.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction</p> <p>B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule</p> <p>B.3.2.E.b. - 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		<p>B.8.3.C.c. - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.9-10. - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.9-10.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>RST.9-10.5. - 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>RST.9-10.10. - By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10. - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1. - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2. - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(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).</p> <p>WHST.9-10.3. - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. 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The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4. - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>B.8.3.C.c. - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.11-12. - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.11-12.1. - 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>RST.11-12.5. - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p>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.</p> <p>RST.11-12.10. - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12. - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1. - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.11-12.2. - Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3. - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4. - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
Membrane Transport	MO	<p>MO.B. - Biology I</p> <p>B.3. - Characteristic and Interactions of Living Organisms</p> <p>B.3.1. - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C. - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes</p> <p>B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds</p>	<p>MO.B. - Biology I</p> <p>B.3. - Characteristic and Interactions of Living Organisms</p> <p>B.3.1. - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C. - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - 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<p>B.3.2.D.b. - Relate the structure of organic compounds (e.g., proteins, nucleic acids, lipids, carbohydrates) to their role in living systems</p> <p>B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)</p> <p>B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction</p> <p>B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule</p> <p>B.3.2.E.b. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.a. - Explain the significance of the selectively permeable membrane to the transport of molecules</p> <p>B.7. - Scientific Inquiry</p> <p>B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A. - 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By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10. - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1. - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an argument that supports the claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2. - 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Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2. - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, and technical processes, including the narration of historical events, scientific procedures/ experiments, and technical processes.</p>	<p>B.3.2.D.b. - Relate the structure of organic compounds (e.g., proteins, nucleic acids, lipids, carbohydrates) to their role in living systems</p> <p>B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)</p> <p>B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction</p> <p>B.3.2.E. - 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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>RST.11-12.10. - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12. - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1. - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.11-12.2. - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p>
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In science and WHST.9-10.4. - Produce clear and coherent writing in which the development, organization, and style are appropriate to the task, purpose, and audience.</p>	<p>WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(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).</p> <p>WHST.9-10.3. - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. 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In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4. - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3. - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. 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Nitrogen Cycle	MO	<p>MO.B. - Biology I</p> <p>B.1. - Properties and Principles of Matter and Energy</p> <p>B.1.2. - Energy has a source, can be stored, and can be transferred but is conserved within a system</p> <p>B.1.2.F. - Energy can be transferred within a system as the total amount of energy remains constant (i.e., Law of Conservation of Energy)</p> <p>B.1.2.F.a. - Classify the different ways to store energy (i.e., chemical, nuclear, thermal, mechanical, electromagnetic) and describe the transfer of energy as it changes from kinetic to potential, while the total amount of energy remains constant, within a system (e.g., biochemical processes, carbon dioxide-oxygen cycle, nitrogen cycle, food web)</p> <p>B.3. - Characteristic and Interactions of Living Organisms</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes</p> <p>B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds</p> <p>B.3.2.D.b. - Relate the structure of organic compounds (e.g., proteins, nucleic acids, lipids, carbohydrates) to their role in living systems</p> <p>B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)</p> <p>B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction</p> <p>B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule</p> <p>B.3.2.E.b. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.c. - Explain how water is important to cells (e.g., is a buffer for body temperature, provides soluble environment for chemical reactions, serves as a reactant in chemical reactions, provides hydration that maintains cell turgidity, maintains protein shape)</p> <p>B.4. - Changes in Ecosystems and Interactions of Organisms with their Environments</p> <p>B.4.1. - Organisms are interdependent with one another and with their environment</p> <p>B.4.1.C. - All organisms, including humans, and their activities cause changes in their environment that affect the ecosystem</p> <p>B.4.1.C.b. - Predict and explain how natural or human caused changes (biological, chemical and/or physical) in one ecosystem may affect other ecosystems due to natural mechanisms (e.g., global wind patterns, water cycle, ocean currents)</p> <p>B.4.1.D. - The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes</p> <p>B.4.1.D.a. - 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<p>B.4.3.C - Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem</p> <p>B.4.3.C.d - Given a scenario describing an environmental change, hypothesize why a given species was unable to survive</p> <p>B.7 - Scientific Inquiry</p> <p>B.7.1 - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c - Design and conduct a valid experiment</p> <p>B.7.1.A.e - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g - Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a - 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By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2 - 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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>RST.11-12.10 - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p>	<p>B.4.3.C - Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem</p> <p>B.4.3.C.d - Given a scenario describing an environmental change, hypothesize why a given species was unable to survive</p> <p>B.7 - Scientific Inquiry</p> <p>B.7.1 - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c - Design and conduct a valid experiment</p> <p>B.7.1.A.e - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g - Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b - Communicate and defend a scientific argument</p> <p>B.8 - Impact of Science, Technology and Human Activity</p> <p>B.8.3 - Science and technology affect, and are affected by, society</p> <p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.ESS - Earth &amp; Space Science</p> <p>ESS.4 - Changes in Ecosystems and Interactions of Organisms with their Environments</p> <p>ESS.4.1 - Organisms are interdependent with one another and with their environment</p> <p>ESS.4.1.C - All organisms, including humans, and their activities cause changes in their environment that affect the ecosystem</p> <p>ESS.4.1.C.a - Predict and explain how natural or human caused changes (biological, chemical and/or physical) in one ecosystem may affect other ecosystems due to natural mechanisms (e.g., global wind patterns, water cycle, ocean currents)</p> <p>MO.RST.11-12 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.11-12.1 - 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>RST.11-12.5 - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p>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.</p> <p>RST.11-12.10 - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p>
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The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and WHST-9-10.4. - Produce clear and coherent writing in which the development, organization, and style are appropriate to</p>	<p>WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(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).</p> <p>WHST.9-10.3. - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and WHST-9-10.4. - Produce clear and coherent writing in which the development, organization, and style are appropriate to</p>	<p>WHST.11-12.2. - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3. - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4. - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>WHST.11-12.2. - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3. - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4. - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
Osmosis	MO	<p>MO.B. - Biology I</p> <p>B.3. - Characteristic and Interactions of Living Organisms</p> <p>B.3.1. - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C. - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.b. - Predict the movement of molecules across a selectively permeable membrane (i.e., diffusion, osmosis, active transport) needed for a cell to maintain homeostasis given concentration gradients and different sizes of molecules</p> <p>B.7. - Scientific Inquiry</p> <p>B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a. - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c. - Design and conduct a valid experiment</p> <p>B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D. - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b. - Communicate and defend a scientific argument</p> <p>B.8. - Impact of Science, Technology and Human Activity</p>	<p>MO.B. - Biology I</p> <p>B.3. - Characteristic and Interactions of Living Organisms</p> <p>B.3.1. - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C. - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.b. - Predict the movement of molecules across a selectively permeable membrane (i.e., diffusion, osmosis, active transport) needed for a cell to maintain homeostasis given concentration gradients and different sizes of molecules</p> <p>B.7. - Scientific Inquiry</p> <p>B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a. - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c. - Design and conduct a valid experiment</p> <p>B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D. - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b. - 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Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D. - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b. - Communicate and defend a scientific argument</p> <p>B.8. - Impact of Science, Technology and Human Activity</p>

		<p>B.8.3 - Science and technology affect, and are affected by, society</p> <p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.9-10 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.9-10.1 - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>RST.9-10.5 - 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>RST.9-10.10 - By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(d) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.9-10.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.9-10.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>B.8.3 - Science and technology affect, and are affected by, society</p> <p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.9-10 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.9-10.1 - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>RST.9-10.5 - 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>RST.9-10.10 - By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(d) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.9-10.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.9-10.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>B.8.3 - Science and technology affect, and are affected by, society</p> <p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.11-12 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.11-12.1 - 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>RST.11-12.5 - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p>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.</p> <p>RST.11-12.10 - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.11-12.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>B.8.3 - Science and technology affect, and are affected by, society</p> <p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.11-12 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.11-12.1 - 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>RST.11-12.5 - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p>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.</p> <p>RST.11-12.10 - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.11-12.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
Photosynthesis -	MO	<p>MO.B. - Biology I</p> <p>B.3 - Characteristic and Interactions of Living Organisms</p> <p>B.3.1 - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2 - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b - Compare and contrast the structure and function of cell wall and cell membranes</p>	<p>MO.B. - Biology I</p> <p>B.3 - Characteristic and Interactions of Living Organisms</p> <p>B.3.1 - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2 - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b - Compare and contrast the structure and function of cell wall and cell membranes</p>	<p>MO.B. - Biology I</p> <p>B.3 - Characteristic and Interactions of Living Organisms</p> <p>B.3.1 - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2 - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b - Compare and contrast the structure and function of cell wall and cell membranes</p>	<p>MO.B. - Biology I</p> <p>B.3 - Characteristic and Interactions of Living Organisms</p> <p>B.3.1 - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C - Cells are the fundamental units of structure and function of all living things</p> <p>B.3.1.C.b - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2 - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.A.b - Compare and contrast the structure and function of cell wall and cell membranes</p>

B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes  
B.3.2.B. - Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth  
B.3.2.B.a. - Explain the interrelationship between the processes of photosynthesis and cellular respiration (e.g., recycling of oxygen and carbon dioxide), comparing and contrasting photosynthesis and cellular respiration reactions (Do NOT assess intermediate reactions)  
B.3.2.B.b. - Determine what factors affect the processes of photosynthesis and cellular respiration (i.e., light intensity, availability of reactants, temperature)  
B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds  
B.3.2.D.b. - Relate the structure of organic compounds (e.g., proteins, nucleic acids, lipids, carbohydrates) to their role in living systems  
B.3.2.D.c. - Recognize energy is absorbed or released in the breakdown and/or synthesis of organic compounds  
B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)  
B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction  
B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule  
B.3.2.E.b. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)  
B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)  
B.3.2.F.b. - Predict the movement of molecules across a selectively permeable membrane (i.e., diffusion, osmosis, active transport) needed for a cell to maintain homeostasis given concentration gradients and different sizes of molecules  
B.4. - Changes in Ecosystems and Interactions of Organisms with their Environments  
B.4.1. - Organisms are interdependent with one another and with their environment  
B.4.1.C. - All organisms, including humans, and their activities cause changes in their environment that affect the ecosystem  
B.4.1.C.b. - Predict and explain how natural or human caused changes (biological, chemical and/or physical) in one ecosystem may affect other ecosystems due to natural mechanisms (e.g., global wind patterns, water cycle, ocean currents)  
B.4.1.D. - The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes  
B.4.1.D.a. - Predict the impact (beneficial or harmful) a natural or human caused environmental event (e.g., forest fire, flood, volcanic eruption, avalanche, acid rain, global warming, pollution, deforestation, introduction of an exotic species) may have on the diversity of different species in an ecosystem  
B.4.3. - Genetic variation sorted by the natural selection process explains evidence of biological evolution  
B.4.3.C. - Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem  
B.4.3.C.d. - Given a scenario describing an environmental change, hypothesize why a given species was unable to survive  
B.7. - Scientific Inquiry  
B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking  
B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation  
B.7.1.A.a. - Formulate testable questions and hypotheses  
B.7.1.A.c. - Design and conduct a valid experiment  
B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies  
B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements  
B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations  
B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)  
B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)  
B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)  
B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)  
B.7.1.D. - The nature of science relies upon communication of results and justification of explanations  
B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings  
B.7.1.D.b. - Communicate and defend a scientific argument  
B.8. - Impact of Science, Technology and Human Activity  
B.8.3. - Science and technology affect, and are affected by, society

B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes  
B.3.2.B. - Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth  
B.3.2.B.a. - Explain the interrelationship between the processes of photosynthesis and cellular respiration (e.g., recycling of oxygen and carbon dioxide), comparing and contrasting photosynthesis and cellular respiration reactions (Do NOT assess intermediate reactions)  
B.3.2.B.b. - Determine what factors affect the processes of photosynthesis and cellular respiration (i.e., light intensity, availability of reactants, temperature)  
B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds  
B.3.2.D.b. - Relate the structure of organic compounds (e.g., proteins, nucleic acids, lipids, carbohydrates) to their role in living systems  
B.3.2.D.c. - Recognize energy is absorbed or released in the breakdown and/or synthesis of organic compounds  
B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)  
B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction  
B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule  
B.3.2.E.b. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)  
B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)  
B.3.2.F.b. - Predict the movement of molecules across a selectively permeable membrane (i.e., diffusion, osmosis, active transport) needed for a cell to maintain homeostasis given concentration gradients and different sizes of molecules  
B.4. - Changes in Ecosystems and Interactions of Organisms with their Environments  
B.4.1. - Organisms are interdependent with one another and with their environment  
B.4.1.C. - All organisms, including humans, and their activities cause changes in their environment that affect the ecosystem  
B.4.1.C.b. - Predict and explain how natural or human caused changes (biological, chemical and/or physical) in one ecosystem may affect other ecosystems due to natural mechanisms (e.g., global wind patterns, water cycle, ocean currents)  
B.4.1.D. - The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes  
B.4.1.D.a. - Predict the impact (beneficial or harmful) a natural or human caused environmental event (e.g., forest fire, flood, volcanic eruption, avalanche, acid rain, global warming, pollution, deforestation, introduction of an exotic species) may have on the diversity of different species in an ecosystem  
B.4.3. - Genetic variation sorted by the natural selection process explains evidence of biological evolution  
B.4.3.C. - Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem  
B.4.3.C.d. - Given a scenario describing an environmental change, hypothesize why a given species was unable to survive  
B.7. - Scientific Inquiry  
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B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation  
B.7.1.A.a. - Formulate testable questions and hypotheses  
B.7.1.A.c. - Design and conduct a valid experiment  
B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies  
B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements  
B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations  
B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)  
B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)  
B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)  
B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)  
B.7.1.D. - The nature of science relies upon communication of results and justification of explanations  
B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings  
B.7.1.D.b. - Communicate and defend a scientific argument  
B.8. - Impact of Science, Technology and Human Activity  
B.8.3. - Science and technology affect, and are affected by, society

B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes  
B.3.2.B. - Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth  
B.3.2.B.a. - Explain the interrelationship between the processes of photosynthesis and cellular respiration (e.g., recycling of oxygen and carbon dioxide), comparing and contrasting photosynthesis and cellular respiration reactions (Do NOT assess intermediate reactions)  
B.3.2.B.b. - Determine what factors affect the processes of photosynthesis and cellular respiration (i.e., light intensity, availability of reactants, temperature)  
B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds  
B.3.2.D.b. - Relate the structure of organic compounds (e.g., proteins, nucleic acids, lipids, carbohydrates) to their role in living systems  
B.3.2.D.c. - Recognize energy is absorbed or released in the breakdown and/or synthesis of organic compounds  
B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)  
B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction  
B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule  
B.3.2.E.b. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)  
B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)  
B.3.2.F.b. - Predict the movement of molecules across a selectively permeable membrane (i.e., diffusion, osmosis, active transport) needed for a cell to maintain homeostasis given concentration gradients and different sizes of molecules  
B.4. - Changes in Ecosystems and Interactions of Organisms with their Environments  
B.4.1. - Organisms are interdependent with one another and with their environment  
B.4.1.C. - All organisms, including humans, and their activities cause changes in their environment that affect the ecosystem  
B.4.1.C.b. - Predict and explain how natural or human caused changes (biological, chemical and/or physical) in one ecosystem may affect other ecosystems due to natural mechanisms (e.g., global wind patterns, water cycle, ocean currents)  
B.4.1.D. - The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes  
B.4.1.D.a. - Predict the impact (beneficial or harmful) a natural or human caused environmental event (e.g., forest fire, flood, volcanic eruption, avalanche, acid rain, global warming, pollution, deforestation, introduction of an exotic species) may have on the diversity of different species in an ecosystem  
B.4.3. - Genetic variation sorted by the natural selection process explains evidence of biological evolution  
B.4.3.C. - Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem  
B.4.3.C.d. - Given a scenario describing an environmental change, hypothesize why a given species was unable to survive  
B.7. - Scientific Inquiry  
B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking  
B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation  
B.7.1.A.a. - Formulate testable questions and hypotheses  
B.7.1.A.c. - Design and conduct a valid experiment  
B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies  
B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements  
B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations  
B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)  
B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)  
B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)  
B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)  
B.7.1.D. - The nature of science relies upon communication of results and justification of explanations  
B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings  
B.7.1.D.b. - Communicate and defend a scientific argument  
B.8. - Impact of Science, Technology and Human Activity  
B.8.3. - Science and technology affect, and are affected by, society

B.3.2.A.c. - Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes  
B.3.2.B. - Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth  
B.3.2.B.a. - Explain the interrelationship between the processes of photosynthesis and cellular respiration (e.g., recycling of oxygen and carbon dioxide), comparing and contrasting photosynthesis and cellular respiration reactions (Do NOT assess intermediate reactions)  
B.3.2.B.b. - Determine what factors affect the processes of photosynthesis and cellular respiration (i.e., light intensity, availability of reactants, temperature)  
B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds  
B.3.2.D.b. - Relate the structure of organic compounds (e.g., proteins, nucleic acids, lipids, carbohydrates) to their role in living systems  
B.3.2.D.c. - Recognize energy is absorbed or released in the breakdown and/or synthesis of organic compounds  
B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)  
B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction  
B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule  
B.3.2.E.b. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)  
B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)  
B.3.2.F.b. - Predict the movement of molecules across a selectively permeable membrane (i.e., diffusion, osmosis, active transport) needed for a cell to maintain homeostasis given concentration gradients and different sizes of molecules  
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B.4.1. - Organisms are interdependent with one another and with their environment  
B.4.1.C. - All organisms, including humans, and their activities cause changes in their environment that affect the ecosystem  
B.4.1.C.b. - Predict and explain how natural or human caused changes (biological, chemical and/or physical) in one ecosystem may affect other ecosystems due to natural mechanisms (e.g., global wind patterns, water cycle, ocean currents)  
B.4.1.D. - The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes  
B.4.1.D.a. - Predict the impact (beneficial or harmful) a natural or human caused environmental event (e.g., forest fire, flood, volcanic eruption, avalanche, acid rain, global warming, pollution, deforestation, introduction of an exotic species) may have on the diversity of different species in an ecosystem  
B.4.3. - Genetic variation sorted by the natural selection process explains evidence of biological evolution  
B.4.3.C. - Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem  
B.4.3.C.d. - Given a scenario describing an environmental change, hypothesize why a given species was unable to survive  
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B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation  
B.7.1.A.a. - Formulate testable questions and hypotheses  
B.7.1.A.c. - Design and conduct a valid experiment  
B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies  
B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements  
B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations  
B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)  
B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)  
B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)  
B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)  
B.7.1.D. - The nature of science relies upon communication of results and justification of explanations  
B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings  
B.7.1.D.b. - Communicate and defend a scientific argument  
B.8. - Impact of Science, Technology and Human Activity  
B.8.3. - Science and technology affect, and are affected by, society

		<p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c. - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.ESS - Earth &amp; Space Science</p> <p>ESS.4 - Changes in Ecosystems and Interactions of Organisms with their Environments</p> <p>ESS.4.1 - Organisms are interdependent with one another and with their environment</p> <p>ESS.4.1.C - All organisms, including humans, and their activities cause changes in their environment that affect the ecosystem</p> <p>ESS.4.1.C.a. - Predict and explain how natural or human caused changes (biological, chemical and/or physical) in one ecosystem may affect other ecosystems due to natural mechanisms (e.g., global wind patterns, water cycle, ocean currents)</p> <p>MO.RST.9-10 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.9-10.1 - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>RST.9-10.5 - 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>RST.9-10.10 - By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from and supports the argument presented.</p> <p>WHST.9-10.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.9-10.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(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).</p> <p>WHST.9-10.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.9-10.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c. - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.ESS - Earth &amp; Space Science</p> <p>ESS.4 - Changes in Ecosystems and Interactions of Organisms with their Environments</p> <p>ESS.4.1 - Organisms are interdependent with one another and with their environment</p> <p>ESS.4.1.C - All organisms, including humans, and their activities cause changes in their environment that affect the ecosystem</p> <p>ESS.4.1.C.a. - Predict and explain how natural or human caused changes (biological, chemical and/or physical) in one ecosystem may affect other ecosystems due to natural mechanisms (e.g., global wind patterns, water cycle, ocean currents)</p> <p>MO.RST.9-10 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.9-10.1 - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>RST.9-10.5 - 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>RST.9-10.10 - By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p> <p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.9-10.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.9-10.2(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).</p> <p>WHST.9-10.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.9-10.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c. - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.ESS - Earth &amp; Space Science</p> <p>ESS.4 - Changes in Ecosystems and Interactions of Organisms with their Environments</p> <p>ESS.4.1 - Organisms are interdependent with one another and with their environment</p> <p>ESS.4.1.C - All organisms, including humans, and their activities cause changes in their environment that affect the ecosystem</p> <p>ESS.4.1.C.a. - Predict and explain how natural or human caused changes (biological, chemical and/or physical) in one ecosystem may affect other ecosystems due to natural mechanisms (e.g., global wind patterns, water cycle, ocean currents)</p> <p>MO.RST.11-12 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.11-12.1 - 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>RST.11-12.5 - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p>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.</p> <p>RST.11-12.10 - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.11-12.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>B.8.3.C - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c. - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.ESS - Earth &amp; Space Science</p> <p>ESS.4 - Changes in Ecosystems and Interactions of Organisms with their Environments</p> <p>ESS.4.1 - Organisms are interdependent with one another and with their environment</p> <p>ESS.4.1.C - All organisms, including humans, and their activities cause changes in their environment that affect the ecosystem</p> <p>ESS.4.1.C.a. - Predict and explain how natural or human caused changes (biological, chemical and/or physical) in one ecosystem may affect other ecosystems due to natural mechanisms (e.g., global wind patterns, water cycle, ocean currents)</p> <p>MO.RST.11-12 - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.11-12.1 - 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>RST.11-12.5 - Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p>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.</p> <p>RST.11-12.10 - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12 - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1 - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.11-12.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
Synaptic Transmission - MO	MO	<p>MO.B. - Biology I</p> <p>B.3 - Characteristic and Interactions of Living Organisms</p> <p>B.3.1 - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C - Cells are the fundamental units of structure and function of all living things</p>	<p>MO.B. - Biology I</p> <p>B.3 - Characteristic and Interactions of Living Organisms</p> <p>B.3.1 - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C - Cells are the fundamental units of structure and function of all living things</p>	<p>MO.B. - Biology I</p> <p>B.3 - Characteristic and Interactions of Living Organisms</p> <p>B.3.1 - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C - Cells are the fundamental units of structure and function of all living things</p>	<p>MO.B. - Biology I</p> <p>B.3 - Characteristic and Interactions of Living Organisms</p> <p>B.3.1 - There is a fundamental unity underlying the diversity of all living organisms</p> <p>B.3.1.C - Cells are the fundamental units of structure and function of all living things</p>

<p>B.3.1.Cb. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.Ab. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds</p> <p>B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)</p> <p>B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction</p> <p>B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule</p> <p>B.3.2.Eb. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.a. - Explain the significance of the selectively permeable membrane to the transport of molecules</p> <p>B.7. - Scientific Inquiry</p> <p>B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a. - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c. - Design and conduct a valid experiment</p> <p>B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D. - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b. - Communicate and defend a scientific argument</p> <p>B.8. - Impact of Science, Technology and Human Activity</p> <p>B.8.3. - Science and technology affect, and are affected by, society</p> <p>B.8.3.C. - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c. - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.9-10. - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.9-10.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>RST.9-10.5. - 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>RST.9-10.10. - By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10. - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1. - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p>	<p>B.3.1.Cb. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.Ab. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds</p> <p>B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)</p> <p>B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction</p> <p>B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule</p> <p>B.3.2.Eb. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.a. - Explain the significance of the selectively permeable membrane to the transport of molecules</p> <p>B.7. - Scientific Inquiry</p> <p>B.7.1. - Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking</p> <p>B.7.1.A. - Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>B.7.1.A.a. - Formulate testable questions and hypotheses</p> <p>B.7.1.A.c. - Design and conduct a valid experiment</p> <p>B.7.1.A.e. - Acknowledge some scientific explanations (e.g., explanations of astronomical or meteorological phenomena) cannot be tested using a controlled laboratory experiment, but instead by using a model, due to the limits of the laboratory environment, resources, and/or technologies</p> <p>B.7.1.A.g. - Evaluate the design of an experiment and make suggestions for reasonable improvements</p> <p>B.7.1.B. - Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D. - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b. - Communicate and defend a scientific argument</p> <p>B.8. - Impact of Science, Technology and Human Activity</p> <p>B.8.3. - Science and technology affect, and are affected by, society</p> <p>B.8.3.C. - Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent</p> <p>B.8.3.C.c. - Identify and evaluate the role of models as an ethical alternative to direct experimentation (e.g., using a model for a stream rather than pouring oil in an existing stream when studying the effects of oil pollution on aquatic plants)</p> <p>MO.RST.9-10. - Reading Standards for Literacy in Science and Technical Subjects</p> <p>- Key Ideas and Details</p> <p>RST.9-10.1. - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</p> <p>RST.9-10.5. - 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>RST.9-10.10. - By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.</p> <p>MO.WHST.9-10. - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.9-10.1. - Write arguments focused on discipline-specific content.</p> <p>WHST.9-10.1(a) - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an WHST.9-10.1(b) - Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.</p>	<p>B.3.1.Cb. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - Living organisms carry out life processes in order to survive</p> <p>B.3.2.A. - The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>B.3.2.Ab. - Compare and contrast the structure and function of cell wall and cell membranes</p> <p>B.3.2.D. - Cells carry out chemical transformations that use energy for the synthesis or breakdown of organic compounds</p> <p>B.3.2.D.d. - Explain how protein enzymes affect chemical reactions (e.g., the breakdown of food molecules, growth and repair, regulation)</p> <p>B.3.2.D.e. - Interpret a data table showing the effects of an enzyme on a biochemical reaction</p> <p>B.3.2.E. - Protein structure and function are coded by the DNA (Deoxyribonucleic acid) molecule</p> <p>B.3.2.Eb. - Recognize the function of protein in cell structure and function (i.e., enzyme action, growth and repair of body parts, regulation of cell division and differentiation)</p> <p>B.3.2.F. - Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>B.3.2.F.a. - 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Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D. - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b. - 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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>RST.11-12.10. - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12. - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1. - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p>	<p>B.3.1.Cb. - Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) that are necessary to the survival of the cell and organism</p> <p>B.3.2. - 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Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <p>B.7.1.B.a. - Make qualitative and quantitative observations using the appropriate senses, tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p> <p>B.7.1.C. - Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) light of evidence (data) and scientific principles (understandings)</p> <p>B.7.1.C.a. - Use qualitative and quantitative data reasonable explanations (conclusions)</p> <p>B.7.1.C.d. - Analyze whether evidence (data) and scientific principles support proposed explanations (laws/principles, theories/models)</p> <p>B.7.1.D. - The nature of science relies upon communication of results and justification of explanations</p> <p>B.7.1.D.a. - Communicate the procedures and results of investigations and explanations through: Oral presentations, Drawings and maps, Data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities), graphs (bar, single, and multiple line) and equations and writings</p> <p>B.7.1.D.b. - 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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>RST.11-12.10. - By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>MO.WHST.11-12. - Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.1. - Write arguments focused on discipline-specific content.</p> <p>WHST.11-12.1(a) - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p>
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<p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(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).</p> <p>WHST.9-10.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and WHST.9-10.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to</p>	<p>WHST.9-10.1(c) - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.9-10.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.9-10.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ WHST.9-10.2(a) - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics WHST.9-10.2(b) - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.9-10.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>WHST.9-10.2(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).</p> <p>WHST.9-10.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.9-10.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and WHST.9-10.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to</p>	<p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.11-12.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>WHST.11-12.1(b) - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</p> <p>WHST.11-12.1(c) - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>WHST.11-12.1(e) - Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>WHST.11-12.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.2(a) - Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.2(b) - Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>WHST.11-12.2(c) - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>WHST.11-12.2(d) - Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.2(e) - Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>WHST.11-12.3 - (See note; not applicable as a separate requirement)</p> <p>WHST.11-12.3(a) - Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.</p> <p>WHST.11-12.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
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