





| Pacing<br>Year,<br>Month or<br>Week<br>(length of<br>time) | Curriculum Focus   |                            |  |  | Instructional<br>Strategies &<br>Activities<br><i>Interventions,<br/>accommodations,<br/>technology integration<br/>(required &amp;<br/>supplemental materials)</i>                          | Resources<br><i>Various resources<br/>used to support<br/>student learning<br/>(i.e.), technology,<br/>media, required<br/>&amp; supplemental<br/>materials.</i> | Assessments<br><i>Types: classroom,<br/>rubrics, common grade<br/>level, formative,<br/>subjective, evidence<br/>used to measure<br/>performance &amp; skills</i> |
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| Week 1-3   | <p><b>B2.2A:</b> Explain how carbon can join to other carbon atoms in chains and rings to form large and complex molecules.</p> <p><b>B2.2B:</b> Recognize the six most common elements in organic molecules (C, H, N, O, P, S).</p> <p><b>B2.2C:</b> Describe the composition of the four major categories of organic molecules (carbohydrates, lipids, proteins, and nucleic acids).</p> <p><b>B2.2D:</b> Explain the general structure and primary functions of the major complex organic molecules that compose living organisms.</p> <p><b>B2.2E:</b> Describe how dehydration and hydrolysis relate to organic molecules.</p> <p>B2.2f: Explain the role of enzymes and other proteins in biochemical functions (e.g., the protein hemoglobin carries oxygen in some organisms, digestive enzymes, and hormones).</p> <p>B2.4f: Recognize and describe that both living and nonliving things are composed of compounds, which are themselves made up of elements joined by energy-containing bonds, such as those in ATP.</p> <p><b>B2.5A:</b> Recognize and explain that macromolecules such as lipids contain high-energy bonds.</p> | Chemistry of living things | <p><b>Students will recognize the six most common elements in organic molecules (C,H,N,O,P,S)</b></p> <p>Students will investigate how selected cells in multicultural organisms are specialized to carry out particular life functions.</p> <p><b>Students will explain how carbon compounds combine and how enzymes work in living systems.</b></p> <p><b>Students will describe the composition of complex molecules (carbohydrates, lipids, proteins and nucleic acids) and their subunits and explain their energy potentials.</b></p> <p>Students will explore that enzymes are biochemical's that act as organic catalysts to speed up the rate of a chemical reaction.</p> <p><b>Students will examine how dehydration and hydrolysis is a chemical reaction: Hydrolysis is essentially the reverse of each other.</b></p> <p>Students will examine how energy is involved in the formation and breaking of chemical bonds.</p> <p>Students will explain the role of enzymes and other proteins in biochemical functions.</p> <p>Students will recognize and describe that both living and nonliving things are composed of compounds, which are themselves made up of elements joined by energy-containing bonds, such as those in ATP.</p> <p><b>Students will recognize and explain that macromolecules such as lipids contain high-energy bonds.</b></p> | <p>ATP<br/>carbohydrate<br/>catalyst<br/>chemical bond<br/>covalent bonds<br/>DNA<br/>dehydration<br/>element-C,H,O,P,S,N<br/>enzyme<br/>hemoglobin<br/>high energy bonds<br/>homeostasis<br/>hormone<br/>hydrolysis<br/>lipid<br/>metabolism<br/>molecular energy<br/>nucleic acid<br/>protein<br/>protein structure<br/>polymers<br/>RNA<br/>substrate</p> | <p><b>Research four organic life molecules</b></p> <p><b>Lab on breakdown of organic molecules</b></p> <p><b>Protein detergent lab</b></p> <p><b>Bake bread food analysis lab/health</b></p> | <p><b>Internet sites</b></p> <p><b>Lab materials</b></p> <p><b>Biology Textbooks</b></p>   | <p><b>Lab reports</b></p> <p><b>Tests</b></p> <p><b>Homework</b></p> <p><b>Posters</b></p>  |
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| <b>Week 3-4</b>   | <p>B3.2A: Identify how energy is stored in an ecosystem.</p> <p>B3.2B: Describe energy transfer through an ecosystem, accounting for energy lost to the environment as heat.</p> <p>B3.2C: Draw the flow of energy through an ecosystem. Predict changes in the food web when one or more organisms are removed.</p> <p>B3.3A: Use a food web to identify and distinguish producers, consumers, and decomposers and explain the transfer of energy through trophic levels.</p> <p>B3.3b: Describe environmental processes (e.g., the carbon and nitrogen cycles) and their role in processing matter crucial for sustaining life.</p> | Matter and Energy in Ecosystems | <p><b>Students will identify how energy is stored in an ecosystem.</b></p> <p><b>Students will describe energy transfer through an ecosystem, accounting for energy lost to the environment as heat.</b></p> <p><b>Students will draw the flow of energy through an ecosystem. Predict changes in the food web when one or more organisms are removed.</b></p> <p><b>Students will use a food web to identify and distinguish producers, consumers, and decomposers and explain the transfer of energy through trophic levels.</b></p> <p>Students will describe environmental processes (e.g., the carbon and nitrogen cycles) and their role in processing matter crucial for sustaining life.</p> | abiotic components<br>biotic components<br>biodiversity<br>carbon<br>carbon cycle<br>carbon dioxide<br>cellular energy<br>conversion<br>cellular respiration<br>chemical bond<br>consumer<br>decomposers<br>energy pyramid<br>flow of energy<br>flow of matter<br>habitat<br>heat<br>nitrogen cycle<br>nitrogen fixation<br>organic compound<br>photosynthesizing –<br>equation<br>organism<br>producer<br>trophic level | <p><b>Article reviews</b></p> <p><b>Creation of real food webs</b></p> <p><b>Diagram interpretations</b></p> <p><b>Lab on photosynthesis/respiration</b></p> <p><b>Habitat biodiversity analysis</b></p> <p><b>Creation of diagrams with food webs and energy pyramids from real life ecosystems</b></p> <p><b>Interpretations of food webs and pyramids.</b></p> | <p><b>Internet</b></p> <p><b>Outdoor analysis areas</b></p> <p><b>Lab materials</b></p> <p><b>Diagrams and charts of food webs and energy pyramids</b></p>       | <p><b>Tests</b></p> <p><b>Lab analysis</b></p>  |

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| <b>Week 4</b>   | <p><b>B2.1A:</b> Explain how cells transform energy (ultimately obtained from the sun) from one form to another through the processes of photosynthesis and respiration. Identify the reactants and products in the general reaction of photosynthesis.</p> <p><b>B2.1B:</b> Compare and contrast the transformations of matter and energy during photosynthesis and respiration.</p> <p><b>B3.1D:</b> Explain how living organisms gain and use mass through the processes of photosynthesis and respiration.</p> <p><b>B2.5C:</b> Describe how energy is transferred and transformed from the Sun to energy-rich molecules during photosynthesis.</p> <p><b>B3.1A:</b> Describe how organisms acquire energy directly or indirectly from sunlight.</p> <p><b>B3.1B:</b> Illustrate and describe the energy conversions that occur during photosynthesis and respiration.</p> <p><b>B3.1C:</b> Recognize the equations for photosynthesis and respiration and identify the reactants and products for both.</p> <p>B3.1e: Write the chemical equation for photosynthesis and cellular respiration and explain in words what they mean.</p> <p>B2.5e: Explain the interrelated nature of photosynthesis and cellular respiration in terms of ATP synthesis and degradation.</p> | <b>Photosynthesis and respiration</b> | <p>Students will explain how cells transform energy (ultimately obtained from the sun) from one form to another through the processes of photosynthesis and respiration. Identify the reactants and products in the general reaction of photosynthesis.</p> <p>Students will compare and contrast the transformations of matter and energy during photosynthesis and respiration.</p> <p>Students will explain how living organisms gain and use mass through the processes of photosynthesis and respiration.</p> <p>Students will describe how energy is transferred and transformed from the Sun to energy-rich molecules during photosynthesis.</p> <p>Students will describe how organisms acquire energy directly or indirectly from sunlight.</p> <p>Students will illustrate and describe the energy conversions that occur during photosynthesis and respiration.</p> <p>Students will recognize the equations for photosynthesis and respiration and identify the reactants and products for both.</p> <p>Students will write the chemical equation for photosynthesis and cellular respiration and explain in words what they mean.</p> | <p>product<br/>reactant<br/>respiration-equation<br/>photosynthesis<br/>respiration<br/>products<br/>reactants<br/>energy<br/>directly<br/>indirectly</p> | <p><b>Design a lab about photosynthesis</b></p> <p><b>Compare and contrasting charts on photosynthesis and respiration</b></p> <p><b>Identify organisms role for energy collection</b></p> <p><b>Equation cartoons</b></p> | <p><b>Plants<br/>Soil<br/>Lab materials<br/>Posters<br/>Internet</b></p>   | <p>Tests<br/>Presentations<br/>Essay<br/>Analysis</p>   |

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| <b>Week 5-6</b>  | <p>B2.2g: Propose how moving an organism to a new environment may influence its ability to survive and predict the possible impact of this type of transfer.</p> <p><b>B3.4A: Describe ecosystem stability. Understand that if a disaster such as flood or fire occurs, the damaged ecosystem is likely to recover in stages of succession that eventually result in a system similar to the original one.</b></p> <p><b>B3.4C: Examine the negative impact of human activities.</b></p> <p>B3.4d: Describe the greenhouse effect and list possible causes.</p> <p>B3.4e: List the possible causes and consequences of global warming.</p> <p><b>B3.5A: Graph changes in population growth, given a data table.</b></p> <p><b>B3.5B: Explain the influences that affect population growth.</b></p> <p><b>B3.5C: Predict the consequences of an invading organism on the survival of other organisms.</b></p> <p>B3.5e: Recognize that and describe how the physical or chemical environment may influence the rate, extent, and nature of population dynamics within ecosystems.</p> <p>B3.5f: Graph an example of exponential growth. Then show the population leveling off at the carrying capacity of the environment.</p> <p>B3.5g: Propose how moving an organism to a new environment may influence its ability to survive and predict the possible impact of this type of transfer.</p> | <p><b>Population Ecology and Human Impacts on the Environment</b></p> | <p>Students will propose how moving an organism to a new environment may influence its ability to survive and predict the possible impact of this type of transfer.</p> <p><b>Students will describe ecosystem stability. Understand that if a disaster such as flood or fire occurs, the damaged ecosystem is likely to recover in stages of succession that eventually result in a system similar to the original one.</b></p> <p><b>Students will examine the negative impact of human activities.</b></p> <p>Students will describe the greenhouse effect and list possible causes.</p> <p>Students will list the possible causes and consequences of global warming.</p> <p><b>Students will graph changes in population growth, given a data table.</b></p> <p><b>Students will explain the influences that affect population growth.</b></p> <p><b>Students will predict the consequences of an invading organism on the survival of other organisms.</b></p> <p>Students will recognize that and describe how the physical or chemical environment may influence the rate, extent, and nature of population dynamics within ecosystems.</p> <p>Students will graph an example of exponential growth. Then show the population leveling off at the carrying capacity of the environment.</p> <p>Students will propose how moving an organism to a new environment may influence its ability to survive and predict the possible impact of this type of transfer.</p> | <p>abiotic components<br/>acid rain<br/>biological adaptations<br/>carrying capacity<br/>conservation<br/>ecosystem stability<br/>ecotourism<br/>equilibrium of ecosystems<br/>erosion<br/>exponential growth<br/>fossil fuel<br/>global warming<br/>greenhouse effect<br/>human modification of the ecosystem<br/>invasive specie<br/>non renewable resources<br/>pollution<br/>population<br/>product<br/>reactant<br/>recycling<br/>renewable resources<br/>reproductive capacity<br/>restoration<br/>succession</p> | <p><b>Invasive species presentation</b></p> <p><b>Graphing population data</b></p> <p><b>Population data analysis</b></p> <p><b>Essay on usage of resources/ecosystem stability</b></p> | <p><b>Internet</b></p> <p><b>Text book</b></p> <p><b>Lab activities</b></p>  | <p><b>Tests</b></p> <p><b>Quizzes</b></p> <p><b>Graphing populations</b></p> <p><b>Presentations on invasive</b></p>  |

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| Week 7-8  | <p>B2.4h: Describe the structures of viruses and bacteria.</p> <p>B2.4i: Recognize that while viruses lack cellular structure, they have the genetic material to invade living cells.</p> <p>B2.5g: Compare and contrast plant and animal cells.</p> <p>B2.5h: Explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, and active transport).</p> <p>B2.5i: Relate cell parts/organelles to their function.</p> <p>B2.4e: Explain how cellular respiration is important for the production of ATP (build on aerobic vs. anaerobic).</p> <p><b>B2.5D: Describe how individual cells break down energy-rich molecules to provide energy for cell functions.</b></p> | Cells – Structure and Function | <p>Students will describe the structures of viruses and bacteria.</p> <p>Students will recognize that while viruses lack cellular structure, they have the genetic material to invade living cells.</p> <p>Students will compare and contrast plant and animal cells.</p> <p>Students will explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, and active transport).</p> <p>Students will relate cell parts/organelles to their function. Clarification: Cellular structures are limited to cell membranes, cell walls, chloroplasts, cytoplasm, Golgi apparatus, mitochondria, nucleus, ribosomes, and vacuoles.</p> <p>Students will explain how cellular respiration is important for the production of ATP (build on aerobic vs. anaerobic).</p> <p><b>Students will describe how individual cells break down energy-rich molecules to provide energy for cell functions.</b></p> | <p>active transport</p> <p>bacteria</p> <p>cell function</p> <p>cell membrane</p> <p>cell nucleus</p> <p>cell organelle</p> <p>cell wall</p> <p>cellular differentiation</p> <p>chloroplast</p> <p>chromosome</p> <p>cytoplasm</p> <p>diffusion</p> <p>diversity</p> <p>DNA</p> <p>eukaryote</p> <p>Golgi apparatus</p> <p>mitochondrion</p> <p>multicellular</p> <p>nucleus</p> <p>organelle</p> <p>osmosis</p> <p>passive transport</p> <p>organism</p> <p>prokaryote</p> <p>ribosome</p> <p>selective permeability</p> <p>unicellular</p> <p>vacuole</p> <p>virus</p> <p>aerobic</p> <p>anaerobic</p> <p>ATP</p> <p>cellular respiration</p> <p>cellular energy</p> <p>conversion</p> <p>enzyme</p> | <p>Microscope analysis of bacteria</p> <p>Cheek cell lab</p> <p>Pond water analysis of unicellular organisms</p> <p>Aerobic/anaerobic lab</p> <p>Virus cycle diagrams</p> <p>Virus research</p> <p>Cell structure identification for various cells</p> | <p>Labs</p> <p>Tests</p> <p>Quizzes</p> <p>Article reviews</p>   | <p>Lab analysis of cheek cells</p> <p>Pond water analysis and collection</p> <p>Bacterial analysis lab</p> <p>Tests</p> <p>Quizzes</p> <p>Virus research</p> <p>Cell research and diagrams</p> |
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| Week 9-10   | <p><b>B2.4B:</b> Describe how various organisms have developed different specializations to accomplish a particular function and yet the end result is the same (e.g., excreting nitrogenous wastes in animals, obtaining oxygen for respiration).</p> <p><b>B2.4C:</b> Explain how different organisms accomplish the same result using different structural specializations (gills vs. lungs vs. membranes).</p> <p><b>B2.5B:</b> Explain how major systems and processes work together in animals and plants, including relationships between organelles, cells, tissues, organs, organ systems, and organisms. Relate these to molecular functions.</p> <p>B2.1e: Predict what would happen if the cells from one part of a developing embryo were transplanted to another part of the embryo.</p> <p>B4.3g: Explain that cellular differentiation results from gene expression and/or environmental influence (e.g., metamorphosis, nutrition).</p> | Comparative Structure and Function of Living Things | <p><b>Students will describe how various organisms have developed different specializations to accomplish a particular function and yet the end result is the same (e.g., excreting nitrogenous wastes in animals, obtaining oxygen for respiration).</b></p> <p><b>Students will explain how different organisms accomplish the same result using different structural specializations (gills vs. lungs vs. membranes).</b></p> <p><b>Students will explain how major systems and processes work together in animals and plants, including relationships between organelles, cells, tissues, organs, organ systems, and organisms. Relate these to molecular functions.</b></p> <p>Students will predict what would happen if the cells from one part of a developing embryo were transplanted to another part of the embryo.</p> <p>Students will explain that cellular differentiation results from gene expression and/or environmental influence (e.g., metamorphosis, nutrition).</p> | anatomical features<br>cell organelle<br>cellular differentiation<br>cellular waste disposal<br>gills<br>lungs<br>natural selection<br>nitrogenous waste<br>organ<br>organism<br>organ systems<br>structural specialization<br>stem cells<br>tissue<br>respiration<br>digestion<br>skeletal,<br>respiration<br>reproduction<br>excretion.<br>cell division<br>cell communication<br>cell regulation<br>cell response<br>embryo formation<br>environmental influence<br>enzyme<br>gene expression<br>homeostasis<br>metamorphosis<br>sexual reproduction<br>transplantation | Research animals and explain the use of various systems for homeostasis.<br><br>Embryo video clips<br><br>Stem cell video clips<br><br>Gene expression research and development.<br><br>Create a lab determining behavior to environmental changes to pH and temperature. | Poster of animal systems<br><br>Lab design and analysis<br><br>Written expression of gene expression   | <b>Lab write up</b><br><br><b>Tests</b><br><br><b>Quizzes</b><br><br><b>Posters</b><br><br><b>Exit surveys</b>  |
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| Week 11-12  | <p><b>B2.3A: Describe how cells function in a narrow range of physical conditions, such as temperature and pH (acidity) to perform life functions.</b></p> <p><b>B2.3B: Describe how the maintenance of a relatively stable internal environment is required for the continuation of life.</b></p> <p><b>B2.3C: Explain how stability is challenged by changing physical, chemical, and environmental conditions as well as the presence of disease agents.</b></p> <p>B2.3e: Describe how human body systems maintain relatively constant internal conditions (temperature, acidity, and blood sugar).</p> <p>B2.6a: Explain that the regulatory and behavioral responses of an organism to external stimuli occur in order to maintain both short- and long-term equilibrium.</p> |                     | <p><b>Students will describe how cells function in a narrow range of physical conditions, such as temperature and pH (acidity) to perform life functions.</b></p> <p><b>Students will describe how the maintenance of a relatively stable internal environment is required for the continuation of life.</b></p> <p><b>Students will explain how stability is challenged by changing physical, chemical, and environmental conditions as well as the presence of disease agents.</b></p> <p>Students will describe how human body systems maintain relatively constant internal conditions (temperature, acidity, and blood sugar).</p> <p>Students will explain that the regulatory and behavioral responses of an organism to external stimuli occur in order to maintain both short- and long-term equilibrium.</p> | <p>behavioral response</p> <p>disease agents</p> <p>equilibrium</p> <p>homeostasis</p> <p>pH</p> <p>physiological change</p> <p>regulatory response</p> | <p>Create a lab determining behavior to environmental changes to pH and temperature on gold fish or small organisms.</p> <p><b>Disease research on effects of local species</b></p> |  | <p><b>Research presentations</b></p> <p><b>Lab write up</b></p> <p><b>Life cycle diagram-disease</b></p>  |
|   |   |                     |  |   |   |  |   |