


Biology Curriculum Bundle #5

Title		Suggested Dates
Cells		11/16-12/4 (12 days)

Big Idea/Enduring Understanding	Guiding Questions
Cells are an organism's basic units of structure and function.	<ul style="list-style-type: none"> ▪ How do cells process matter and energy to carry out the functions of life? ▪ How are the functions of a cell similar to and different from the functions of an organism?

The resources included here provide teaching examples and/or meaningful learning experiences to address the District Curriculum. In order to address the TEKS to the proper depth and complexity, teachers are encouraged to use resources to the degree that they are congruent with the TEKS and research-based best practices. Teaching using only the suggested resources does not guarantee student mastery of all standards. Teachers must use professional judgment to select among these and/or other resources to teach the district curriculum.

Knowledge & Skills with Student Expectations	District Specificity/Examples	Suggested Resources (See note above)
<p>3 Uses critical thinking and scientific problem solving to make informed decisions.</p> <p>3C Evaluate the impact of research on scientific thought, society, and the environment.</p>	<p>Such as</p> <ul style="list-style-type: none"> • stem cell research and vaccinations (polio and HPV). <p><i>(3D) evaluate the impact of scientific research on society and the environment</i></p>	<p>Stem Cell Research Policy Lesson Plan: Create an Advocacy Brochure (web link)</p>
<p>3 Uses critical thinking and scientific problem solving to make informed decisions.</p> <p>3E Evaluate models according to their adequacy in representing biological objects or events.</p>	<p><i>(3E) evaluate models according to their limitations in representing biological objects or events</i></p>	
<p>4 The student knows that cells are the basic structures of all living things and have specialized parts that perform specific functions, and that viruses are different from cells and have different properties and functions.</p> <p>4A Identify the parts of prokaryotic and eukaryotic cells.</p>	<p>Including</p> <ul style="list-style-type: none"> • Summarize the cell theory • Identify and describe all cellular structures and their functions • Distinguish between plant cells from animal cells <p><i>(4A) compare and contrast prokaryotic and eukaryotic cells</i></p>	<p>BIO_5_Cheek_cells BIO_5_Viewing_Plant_Cells Cell Structure Animation (web link)</p>
<p>4 The student knows that cells are the basic structures of all living things and have specialized parts that perform specific functions, and that viruses are</p>	<p>Including</p> <ul style="list-style-type: none"> • Mention ADP and ATP specifically in Energy Production 	<p>BIO_5_diffusion lab BIO_5_egg lab</p>

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<p>different from cells and have different properties and functions.</p> <p>4B Investigate and identify cellular processes. Including --- Homeostasis --- Permeability --- Energy production --- Transportation of molecules --- Disposal of wastes --- Function of Cellular parts --- Synthesis of new molecules</p>	<ul style="list-style-type: none"> • Transportation of molecules: <ul style="list-style-type: none"> ○ Active ○ Passive ○ Facilitated diffusion • Protein synthesis emphasized. <p><i>(4B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules</i></p>	
<p>6 The student knows the structures and functions of nucleic acids in the mechanisms of genetics.</p> <p>6E Compare the processes of mitosis and meiosis and their significance to sexual and asexual reproduction.</p>	<p>Including</p> <ul style="list-style-type: none"> • Describe the process of mitosis (cell division) <ul style="list-style-type: none"> ○ Cell cycle • Recognize the role of mitosis in the production of somatic cells • Describe the process of meiosis • Recognize the role of meiosis in haploid gametes (gametogenesis) • Describe cancer as uncontrolled cell division <p><i>(6G) recognize the significance of meiosis to sexual reproduction</i></p>	<p><u>Cellular Structure and Function</u></p>
<p>9 The student knows metabolic processes and energy transfers that occur in living organisms.</p> <p>9B Compare the energy flow in photosynthesis to the energy flow in cellular respiration.</p>	<p>Including</p> <ul style="list-style-type: none"> • Distinguish between photosynthesis and cellular respiration. <ul style="list-style-type: none"> ○ Understand the chemical equation that represents photosynthesis and cellular respiration such as balancing the equation and that the products of one reaction is the reactants of the other. • Relate the light-dependent reaction and the light independent reaction during photosynthesis to each other. • -Recognize process of glycolysis and the role of ATP such as ATP yields from photosynthesis and cellular respiration. • Compare and contrast the processes, end products, and energy production in aerobic respiration and anaerobic respiration. <ul style="list-style-type: none"> ○ Lactic acid fermentation ○ Alcoholic fermentation 	<p>BIO_5_Fermentation Lab BIO_5_Rate of Photosynthesis Lab</p>

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	<i>(9B) compare the reactants and products of photosynthesis and cellular respiration in terms of energy and matter</i>	
3 Uses critical thinking and scientific problem solving to make informed decisions. 3A Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.	NOTE: Can use debates on current topics and reading/discussing current events. <i>(3A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student</i>	
2 Uses scientific methods during fields & laboratory investigations. 2D Communicate valid conclusions	Such as <ul style="list-style-type: none"> • lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports. <i>(2H) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports.</i>	
3 Uses critical thinking and scientific problem solving to make informed decisions. 3F Research and describe the history of biology and contributions of scientists	Such as Matthias Jakob Schleiden, Theodor Schwann, Rudolf Virchow, Peter D. Mitchell, Melvin Calvin, Sir Hans Adolf Krebs, Lynn Margulis	
5 The student knows how an organism grows and how specialized cells, tissues, and organs develop. 5C Sequence the levels of organization in multicellular organisms to relate the parts to each other and to the whole.	Including (in sequence) <ul style="list-style-type: none"> • Atom, Molecule, Organelle, Cell, Tissue, Organ, Organ system, Organism, Population, Community, Ecosystem, Biome, Biosphere <i>(10C) analyze the levels of organization in biological systems and relate the levels to each other and to the whole system.</i>	