Instructional Calendar Biology 2016-2017

Biology Instructional Calendar 2016			
1. Creativity and innovation: Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology**.** **2. Communication and collaboration**: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. **3. Research and information fluency**: Students apply digital tools to gather, evaluate, and use information. **4. Critical thinking, problem solving, and decision making**: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. **5. Digital citizenship**: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. **6. Technology Operations and Concepts:** Students demonstrate and sound understanding of technology concepts, systems and operations.			
Quarter 1 **Units: Nature of Science, Ecology, Chemistry of Life**	**Quarter 2** **Units: Cell Structure and Function, Cell Transport, Cellular Energy**	**Quarter 3** **Units: Cell Growth/Division, Genetics/Heredity**	**Quarter 4** **Units: Evolution, Human Anatomy/Physiology**
Evidence Outcomes 1.2 a. Develop, communicate, and justify an evidence-based scientific explanation supporting the current model of an atom (DOK 1-3) c. Use characteristic physical and chemical properties to develop predictions and supporting claims about elements' positions on the periodic table (DOK 1-2) d. Develop a model that	Evidence Outcomes 2.4 a. Develop, communicate, and justify an evidence-based scientific explanation the optimal environment for photosynthetic activity (DOK 1-3) c. Explain how carbon compounds are gradually oxidized to provide energy in the form of adenosine triphosphate (ATP), which drives many chemical 2.5 b. Compare organisms that live in freshwater and marine environments, and identify the challenges of osmotic regulation	Evidence Outcomes 2.7 a. Analyze and interpret data that genes are expressed portions of DNA. (DOK 1-2) b. Analyze and interpret data on the processes of DNA replication, transcription, translation, and gene regulation, and show how these processes are the same in all organisms (DOK 1-2) c. Recognize that proteins carry out most cell activities and mediate the effect of genes on physical and behavioral traits in an organism (DOK 1) d. Evaluate data showing that offspring are not clones	Evidence Outcomes 2.6 a. Discuss how two or more body systems interact to promote health for the whole organism (DOK 1-2) b. Analyze and interpret data on homeostatic mechanisms using direct and indirect evidence to develop and support claims about the effectiveness of feedback loops to maintain homeostasis (DOK 1-2) c. Distinguish between causation and correlation in epidemiological data, such as examining scientifically valid evidence regarding disrupted homeostasis in

differentiates atoms and molecules, elements and compounds, and pure substances and mixtures (DOK 2-3) 1.3 a. Recognize, analyze, interpret, and balance chemical equations (synthesis, decomposition, combustion, and replacement) or nuclear equations (fusion and fission) (DOK 1-2) b. Predict reactants and products for different types of chemical and nuclear reactions (DOK 1-2) 1.4 a. Develop, communicate, and justify an evidence-based scientific explanation supporting the current models of chemical bonding (DOK 1-3) b. Gather, analyze, and interpret data on chemical and physical properties of different compounds such as density, melting point,	for these organisms (DOK 2) c. Diagram the cell membrane schematically, and highlight receptor proteins as targets of hormones, neurotransmitters, or drugs that serve as active links between intra and extracellular environments (DOK 1) d. Use tools to gather, view, analyze, and interpret data produced during scientific investigations that involve passive and active transport (DOK 1-2) e. Use computer simulations and models to analyze cell transport mechanisms (DOK 1-2) 2.6 d. Use computer simulations and models of homeostatic mechanisms (DOK 1-2)	of their parents or siblings due to the meiotic processes of independent assortment of chromosomes, crossing over, and mutations (DOK 1-2) e. Explain using examples how genetic mutations can benefit, harm, or have neutral effects on an organism (DOK 1-2) 2.8 a. Develop, communicate, and justify an evidence-based scientific explanation of how cells form specialized tissues due to the expression of some genes and not others (DOK 1-3) b. Analyze and interpret data that show most eukaryotic deoxyribonucleic acid (DNA) does not actively code for proteins within cells (DOK 1-2) c. Develop, communicate, and justify an evidence-based scientific explanation for how a whole organism can be cloned from a differentiated – or adult – cell (DOK 1-3) d. Analyze and interpret data on medical problems using direct and indirect evidence in developing and supporting claims that genetic	particular diseases (DOK 2) 2.9 a. Develop, communicate, and justify an evidence-based scientific explanation for how Earth's diverse life forms today evolved from common ancestors (DOK 1-3) b. Analyze and interpret multiple lines of evidence supporting the idea that all species are related by common ancestry such as molecular studies, comparative anatomy, biogeography, fossil record and embryology c. Analyze and interpret data suggesting that over geologic time, discrete bursts of rapid genetic changes and gradual changes have resulted in speciation (DOK 1-3) d. Analyze and interpret data on how evolution can be driven by three key components of natural selection – heritability, genetic variation, and differential survival and reproduction (DOK 1-3) e. Generate a model – an evolutionary tree –	

boiling point, pH, and conductivity (DOK 1-2) c. Use characteristic physical and chemical properties to develop predictions and supporting claims about compounds' classification as ionic, polar or covalent (DOK 1-2) d. Describe the role electrons play in atomic bonding (DOK 1) e. Predict the type of bonding that will occur among elements based on their position in the periodic table (DOK 1-2) 1.5 a. Use appropriate measurements, equations and graphs to gather, analyze, and interpret data on the quantity of energy in a system or an object (DOK 1-3) 1.6 a. Use direct and indirect evidence to develop and support claims about the conservation of energy in		mutations and cancer are brought about by exposure to environmental toxins, radiation, or smoking	showing how a group of organisms is most likely diverged from common ancestry (DOK 2-3)	

a variety of systems, including transformations to heat (DOK 1-3) 2.1 a. Analyze how energy flows through trophic levels (DOK 1-2) b. Evaluate the potential ecological impacts of a plant-based or meat-based diet (DOK 2) c. Analyze and interpret data from experiments on ecosystems where matter such as fertilizer has been added or withdrawn such as through drought (DOK 1-3) d. Develop, communicate, and justify an evidence-based scientific explanation showing how ecosystems follow the laws of conservation of matter and energy (DOK 1-3) e. Define and distinguish between matter and energy, and how they are cycled or lost through life processes (DOK 1-2)				

f. Describe how carbon, nitrogen, phosphorus, and water cycles work (DOK 1) g. Use computer simulations to analyze how energy flows through trophic levels (DOK 1-2) 2.2 a. Analyze and interpret data about the impact of removing keystone species from an ecosystem or introducing non-native species into an ecosystem (DOK 1-3) b. Describe or evaluate communities in terms of primary and secondary succession as they progress over time (DOK 1-2) c. Evaluate data and assumptions regarding different scenarios for future human population growth and their projected consequences d. Examine, evaluate, question, and ethically use information from a variety of sources and				

media to investigate ecosystem interactions (DOK 1-2) 2.3 a. Identify biomolecules and their precursors/building blocks (DOK 1) b. Develop, communicate, and justify an evidence-based explanation that biomolecules follow the same rules of chemistry as any other molecule c. Develop, communicate, and justify an evidence-based explanation regarding the optimal conditions required for enzyme activity (DOK 1-3) d. Infer the consequences to organisms of suboptimal enzyme function – such as altered blood pH or high fever – using direct and indirect evidence (DOK 1-3) e. Analyze and interpret data on the body's utilization of carbohydrates, lipids,				

and proteins (DOK 1-2) 2.4 b. Discuss the interdependence of autotrophic and heterotrophic life forms such as depicting the flow of a carbon atom from the atmosphere, to a leaf, through the food chain, and back to the atmosphere (DOK 1-2)				