

Biology/Living Environment Curriculum

Biochemistry Standard Curriculum Alignment

Subject/Topic: Biochemistry

Unit#: 1

Month: September

Standards	Unit/Topic	Essential Knowledge: What do students absolutely need for the next level?	Resources Used	Assessment
<p>Building block information for HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. [Clarification Statement: Emphasis is on functions at the organism's system level such as nutrient uptake, water delivery, immune response, and organism response to stimuli. An example of an interacting system could be an artery depending on the proper function of elastic tissue and smooth muscle to regulate and deliver the proper amount of blood within the circulatory system.] [Assessment Boundary: Assessment does not include interactions and functions at the molecular or chemical reaction level.]</p>	<p>Define Life (we have to know what organisms are)</p>	<p>SSBAT list the 8 characteristics of living things</p>	<p>Guided notes Bacteria/virus ws</p>	<p>Biochemistry Exam Bell ringer</p>
<p>Building block information</p>	<p>Classification of Organisms</p>	<p>SSBAT explain how organisms are classified into kingdoms.</p>	<p>Guided notes Microscope lab Dichotomous Key lab (sharks/monster)</p>	<p>Exam Bell ringer Dichotomous Key lab (sharks/monster)</p>

			Stream classification activity	Stream classification activity
<p>Building block information for HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis [Clarification Statement: Examples of investigations could include heart rate response to exercise, stomate response to moisture and temperature, and root development in response to water levels.] [Assessment Boundary: Assessment does not include the cellular processes involved in the feedback mechanism.]</p>	<p>Scientific Method</p>	<p>SSBAT identify the parts of the scientific method.</p> <p>SSBAT create and test a hypothesis using the steps of the scientific method.</p> <p>SSBAT form a conclusion based on the data.</p>	<p>Guided notes</p> <p>Natural Science ws</p> <p>Catalase 1 lab</p> <p>Catalase 2 lab</p>	<p>Exam</p> <p>Bell ringer</p> <p>Natural Science ws</p> <p>Catalase 1 lab</p> <p>Catalase 2 lab</p>
<p>Building block information for HS-LS-LS 1-6Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements such as nitrogen, sulfur, and phosphorus to form amino acids and other carbon-based molecules. [Clarification Statement: Emphasis is on using evidence from models and simulations to support explanations for the synthesis of lipids, starches, proteins, and nucleic acids.] [Assessment Boundary: Assessment does not include the details of the specific chemical reactions or identification of structural and molecular formulas for macromolecules.]</p>	<p>Elements and the Periodic Table</p> <p>Ionic/Covalent bonding</p>	<p>SSBAT explain the general structure of an atom.(electron,proton, neutron)</p> <p>SSBAT predict whether an atom will be involved in an ionic bond or covalent bond based on its properties.</p>	<p>Guided notes</p> <p>Bohr Model ws</p>	<p>Biochemistry Exam</p> <p>Bell ringer</p> <p>Bohr Model ws</p>

<p>HS-LS1-6. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements such as nitrogen, sulfur, and phosphorus to form amino acids and other carbon-based molecules.</p> <p>[Clarification Statement: Emphasis is on using evidence from models and simulations to support explanations for the synthesis of lipids, starches, proteins, and nucleic acids.]</p> <p>[Assessment Boundary: Assessment does not include the details of the specific chemical reactions or identification of structural and molecular formulas for macromolecules.]</p>	<p>Organic Molecules</p> <ul style="list-style-type: none"> -proteins -carbohydrates -lipids -nucleic acids 	<p>SSBAT identify the monomers and polymers of the four organic molecules required for life.</p>	<p>Molecules of Life lab</p> <p>Chemistry of Fats and Proteins lab</p>	<p>Biochemistry Exam</p> <p>Bell ringer</p> <p>Molecules of Life lab</p> <p>Chemistry of Fats and Proteins lab</p>
<p>Building block information for HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.</p> <p>[Clarification Statement: Emphasis should be on how the DNA code is transcribed and translated in the synthesis of proteins. Types of proteins involved in performing life functions include enzymes, structural proteins, cell receptors, hormones, and antibodies.]</p> <p>[Assessment Boundary: Assessment does not include identification of specific cell or tissue types, whole body systems, specific protein structures and functions, or the</p>	<p>Enzymes</p>	<p>SSBAT identify that enzymes are a type of protein.</p> <p>SSBAT explain the function of an enzyme.</p> <p>SSBAT draw and label the parts of a lock and key model.</p> <p>SSBAT list the 4 things that affect enzyme activity.</p>	<p>Catalase 1 lab</p> <p>Catalase 2 lab</p>	<p>Biochemistry Exam</p> <p>Bell ringer</p> <p>Catalase 1 lab</p> <p>Catalase 2 lab</p>

detailed biochemistry of protein synthesis.]				
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Cells Standard Curriculum Alignment

Subject/Topic: Cells **Unit#:** 2 **Month:**October/November

Standards	Unit/Topic	Essential Knowledge:	Resources Used	Assessment
	Cells	What do students absolutely need for the next level?		
HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. [Clarification Statement: Emphasis is on functions at the organism's system level such as nutrient uptake, water delivery, immune response, and organism response to stimuli. An example of an interacting system could be an artery depending on the proper function of elastic tissue and smooth muscle to regulate and deliver the proper amount of blood within the circulatory system.] [Assessment Boundary: Assessment does not include interactions and functions at the molecular or chemical reaction level.]	Levels of Organization	SSBAT list the levels of organization in order.	Guided notes	Cell Exam Bell ringer
HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular	Organelles and their functions	SSBAT identify different types of organelles on a diagram. SSBAT explain the function of	Guided notes Organelle research project Organelle ws	Cell Exam Bell ringers Organelle ws Organelle quiz

<p>organisms. [Clarification Statement: Emphasis is on functions at the organism's system level such as nutrient uptake, water delivery, immune response, and organism response to stimuli. An example of an interacting system could be an artery depending on the proper function of elastic tissue and smooth muscle to regulate and deliver the proper amount of blood within the circulatory system.] [Assessment Boundary: Assessment does not include interactions and functions at the molecular or chemical reaction level.]</p>		<p>each organelle.</p>		
	<p>Cell Membrane -Active transport -Diffusion -endo/exocytosis</p>	<p>SSBAT explain how molecules flow through a membrane based on size and concentration.</p>	<p>Guided notes NYS Diffusion through a Membrane lab</p>	<p>Cell Exam Bell ringer NYS Diffusion through a Membrane lab</p>
<p>HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. [Clarification Statement: Emphasis is on illustrating inputs and outputs of matter and the transfer and transformation of energy in photosynthesis by plants and other photosynthesizing organisms. Examples of models could include diagrams, chemical equations, and conceptual models.] [Assessment Boundary: Assessment does not include specific biochemical steps.]</p>	<p>Photosynthesis and Cellular Respiration</p>	<p>SSBAT explain how photosynthesis and cellular respiration are interconnected.</p>	<p>Guided notes Photosynthesis/cellular respiration poster Photosynthesis/cellular respiration ws</p>	<p>Cell Exam Bell ringer Photosynthesis/cellular respiration poster Photosynthesis/cellular respiration ws</p>

<p>HS-LS2-5. Develop a model to illustrate the role of various processes in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere. [Clarification Statement: Examples of models could include simulations, diagrams, and mathematical models of the carbon cycle (photosynthesis, respiration, decomposition, and combustion).] [Assessment Boundary: Assessment does not include the specific chemical steps of photosynthesis and respiration.]</p>				
<p>HS-LS1-7. Use a model to illustrate that aerobic cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy. [Clarification Statement: Emphasis is on the conceptual understanding of the inputs and outputs of the process of aerobic cellular respiration.] [Assessment Boundary: Assessment should not include identification of the steps or specific processes involved in aerobic cellular respiration.]</p> <p>HS-LS2-3. Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in ecosystems. [Clarification Statement: Emphasis is on conceptual understanding of the role of aerobic and</p>	<p>Aerobic versus anaerobic respiration -lactic acid fermentation -alcohol fermentation</p>	<p>SSBAT explain when aerobic or anaerobic cellular respiration will take place.</p> <p>SSBAT identify which type of anaerobic respiration is occurring based on the type of cell going without oxygen.</p> <p>SSBAT identify the waste products of each type of anaerobic respiration.</p>	<p>Photosynthesis/ cellular respiration ws</p> <p>Aerobic versus Anaerobic respiration lab</p>	<p>Cell Exam</p> <p>Bell ringer</p> <p>Photosynthesis/ cellular respiration ws</p> <p>Aerobic versus Anaerobic respiration lab</p>

anaerobic respiration and photosynthesis within ecosystems.] [Assessment Boundary: Assessment does not include the specific chemical processes of aerobic respiration, anaerobic respiration, and photosynthesis.]				
HS-LS1-4. Use a model to illustrate cellular division (mitosis) and differentiation. [Clarification Statement: Emphasis should be on the outcomes of mitotic division and cell differentiation on growth and development of complex organisms and possible implications for abnormal cell division (cancer) and stem cell research.] [Assessment Boundary: Assessment does not include specific gene control mechanisms or recalling the specific steps of mitosis.]	Mitosis	SSBAT identify each stage of mitosis. SSBAT explain the process of mitosis. SSBAT identify the organelles involved in mitosis and define what their function is.	Guided notes Mitosis poster project Mitosis phase cut and paste lab KCEL radio ws-Mitosis in action Mitosis/Meiosis ws	Cell Exam Bell Ringer Mitosis poster project Mitosis phase cut and paste lab KCEL radio ws-Mitosis in action Mitosis/Meiosis ws
HS-LS1-4. Use a model to illustrate cellular division (mitosis) and differentiation. [Clarification Statement: Emphasis should be on the outcomes of mitotic division and cell differentiation on growth and development of complex organisms and possible implications for abnormal cell division (cancer) and stem cell research.] [Assessment Boundary: Assessment does not include specific gene control mechanisms or recalling the specific steps of mitosis.]	Mitosis as a form of asexual reproduction	SSBAT define -regeneration -vegetative propagation -budding -sporulation -binary fission -cancer	Guided notes	Cell Exam Bell Ringer
HS-LS3-2. Make and defend a claim based	Meiosis	SSBAT identify	Guided notes	Cell Exam

<p>on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, (3) mutations caused by environmental factors and/or (4) genetic engineering. [Clarification Statement: Emphasis is on using data to support arguments for the way variation occurs including the relevant processes in meiosis and advances in biotechnology.] [Assessment Boundary: Assessment does not include recalling the specific details of the phases of meiosis or the biochemical mechanisms of the specific phases in the process.]</p>		<p>the states of meiosis.</p> <p>SSBAT compare mitosis and meiosis.</p> <p>SSBAT define: gametogenesis, oogenesis, spermatogenesis</p> <p>SSBAT explain the process of crossing over.</p>	<p>Mitosis/Meiosis ws</p>	<p>Bell Ringer</p> <p>Mitosis/Meiosis ws</p>
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Genetics Standard Curriculum Alignment

Subject/Topic: Genetics

Unit#: 3

Month: December/January

Standards	Unit/Topic	Essential Knowledge: What do students absolutely need for the next level?	Resources Used	Assessment
<p>Building block knowledge</p> <p>HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. [Clarification Statement: Emphasis should be on the distinction between coding and non-coding regions of DNA.]</p>	<p>Dominant and recessive traits</p> <p>Heterozygous/homozygous traits</p>	<p>SSBAT explain dominant traits can be seen or expressed when present.</p> <p>SSBAT explain recessive traits can only be expressed when homozygous</p>	<p>Guided notes</p> <p>Practice crosses</p> <p>PTC paper test</p> <p>Genes Predicted lab</p>	<p>Genetics Exam</p> <p>Bell ringer</p> <p>Practice crosses</p> <p>Genes Predicted lab</p>

<p>HS-LS3-3. Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population. [Clarification Statement: Emphasis is on the use of mathematics to describe the probability of traits as it relates to genetic and environmental factors in the expression of traits.] [Assessment Boundary: Assessment does not include Hardy-Weinberg calculations.]</p>	<p>Punnett squares -dominant -codominance -incomplete dominance -sex-linked traits</p>	<p>SSBAT predict the genotype and phenotype of offspring based on the Punnett square.</p>	<p>Guided notes Practice crosses Pedigree lab Pedigree hw</p>	<p>Exam Bell ringer Practice crosses Pedigree lab Pedigree hw</p>
<p>Building block knowledge</p>	<p>Steps to the discovery of hereditary -Griffith -Avery -Hershey and Chase -Chargaff -Watson and Crick, Franklin</p>	<p>SSBAT mathematically determine the amount of one nucleotide if given a percentage of another one.</p>	<p>Guided notes Practice Chargaff problems</p>	<p>Exam Bell ringer Chargaff % problems</p>
<p>tHS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells. [Clarification Statement: Emphasis should be on how the DNA code is transcribed and translated in the synthesis of proteins. Types of proteins involved in performing life functions include enzymes, structural proteins, cell receptors, hormones, and antibodies.] [Assessment Boundary: Assessment does not include identification of specific cell or tissue types, whole body systems, specific protein</p>	<p>Molecular genetics -the structure of DNA -How DNA replicates</p>	<p>SSBAT explain how DNA replicates. SSBAT determine the nucleotide sequence of side 2 of DNA when given side one.</p>	<p>Guided notes DNA Structure lab</p>	<p>Exam Bell ringer DNA Structure lab</p>

structures and functions, or the detailed biochemistry of protein synthesis.]				
<p>HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells. [Clarification Statement: Emphasis should be on how the DNA code is transcribed and translated in the synthesis of proteins. Types of proteins involved in performing life functions include enzymes, structural proteins, cell receptors, hormones, and antibodies.] [Assessment Boundary: Assessment does not include identification of specific cell or tissue types, whole body systems, specific protein structures and functions, or the detailed biochemistry of protein synthesis.]</p>	<p>Protein synthesis -transcription -translation</p>	<p>SSBAT determine the mRNA sequence when given a gene. SSBAT explain how transcription occurs. SSBAT explain how translation occurs. SSBAT determine the amino acid sequence in a particular protein based on the gene sequence.</p>	<p>DNA Makes a Protein lab Protein Synthesis lab DNA relay game</p>	<p>Genetics Exam Bellringer DNA Makes a Protein lab Protein Synthesis lab DNA relay game</p>
<p>HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, (3) mutations caused by environmental factors and/or (4) genetic engineering. [Clarification Statement: Emphasis is on using data to support arguments for the way variation occurs including the relevant processes in meiosis and advances in biotechnology.] [Assessment Boundary: Assessment does not include recalling the specific</p>	<p>Mutations -Addition -deletion -crossing over</p>	<p>SSBAT identify what type of mutation exists when give DNA strands to examine. SSBAT explain the causes of common genetic diseases. -sickle cell anemia -Down syndrome -Tay Sachs -PKU</p>	<p>Guided notes Genetic Disease Research powerpoint assignment</p>	<p>Genetics Exam Bellringer Genetic Disease Research powerpoint assignment</p>

details of the phases of meiosis or the biochemical mechanisms of the specific phases in the process.]				
<p>tHS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells. [Clarification Statement: Emphasis should be on how the DNA code is transcribed and translated in the synthesis of proteins. Types of proteins involved in performing life functions include enzymes, structural proteins, cell receptors, hormones, and antibodies.] [Assessment Boundary: Assessment does not include identification of specific cell or tissue types, whole body systems, specific protein structures and functions, or the detailed biochemistry of protein synthesis.]</p>	<p>Altering DNA -selective breeding -Cloning -genetic engineering</p>	<p>SSBAT explain the processes of cloning, selective breeding, and genetic engineering.</p>	<p>Guided notes Recombinant DNA lab</p>	<p>Genetics Exam Bellringer Recombinant DNA lab</p>

Evolution Standard Curriculum Alignment

Subject/Topic: Evolution

Unit#: 4

Month: Jan/February

Standards	Unit/Topic	Essential Knowledge: What do students absolutely need for the next level?	Resources Used	Assessment
<p>HS-LS4-1. Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. [Clarification</p>	<p>Evidences of Evolution</p>	<p>SSBAT list evidences of evolution -fossil record -homologous structures</p>	<p>Guided notes</p>	<p>Evolution Exam Bell ringer</p>

<p>Statement: Emphasis is on a conceptual understanding of the role each line of evidence has relating to common ancestry and biological evolution. Examples of evidence could include similarities in DNA sequences, anatomical structures, and order of appearance of structures in embryological development.]</p>		<p>-embryonic development</p>		
<p>“HS-LS4-3. Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait. [Clarification Statement: Emphasis is on analyzing shifts in numerical distribution of traits and using these shifts as evidence to support explanations.] [Assessment Boundary: Assessment is limited to basic statistical and graphical analysis. Assessment does not include allele frequency calculations.]</p>	<p>Theories of Lamarck and Darwin</p>	<p>SSBAT explain how variation occurs and identify advantageous variations based on environment.</p>	<p>Guided notes Phylogenetic Tree lab Lamarck/Darwin ws</p>	<p>Exam Bell ringer Phylogenetic tree lab Lamarck/Darwin ws</p>
<p>HS-LS4-4. Construct an explanation based on evidence for how natural selection leads to adaptation of populations. [Clarification Statement: Emphasis is on using data to provide evidence for how specific biotic and abiotic differences in ecosystems (such as ranges of seasonal temperature, long-term climate change, acidity, light, geographic barriers, or evolution of other organisms) contribute to a change in gene frequency over time, leading to adaptation of populations.]</p>	<p>Isolation -geographic -reproductive Adaptive radiation</p>	<p>SSBAT explain how natural selection leads to variation of the species due to favorable adaptations.</p>	<p>Guided notes Moth lab NYS Beak of the Finch lab</p>	<p>Exam Bell ringer Moth lab Beak of the Finch lab</p>

<p>HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species. [Clarification Statement: Emphasis is on determining cause and effect relationships for how changes to the environment such as deforestation, fishing, introduction of invasive species, application of fertilizers, drought, flood, and the rate of change of the environment affect distribution or disappearance of traits in species.]</p>	<p>Gradualism versus Punctuated Equilibrium</p> <p>Hardy Weinburg theory</p>	<p>SSBAT explain how environmental changes can influence the course of evolution(emergence of new species, extinction of others.</p>	<p>Guided notes</p> <p>Horse lab</p>	<p>Exam</p> <p>Bell ringer</p> <p>Horse lab</p>
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Human Body-Biology Standard Curriculum Alignment

Subject/Topic: Biology/ Human Body

Unit#: 5

Month: March

Standards	Unit/Topic	Essential Knowledge: What do students absolutely need for the next level?	Resources Used	Assessment
<p>HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells. [Assessment Boundary : Assessment does not include identification of specific cell or tissue types, whole body systems, specific protein structures and functions, or the biochemistry of protein synthesis.]</p>	<p>The body's communication system (falls under nervous,endocrine and reproductive systems)</p>	<p>SSBAT explain how body systems communicate through specialized proteins(hormones and neurotransmitters) which land on receptor molecules.</p> <p>SSBAT identify which protein will be able to stimulate a receptor molecule based on its shape.</p>	<p>The FSH question-FSH travels in the bloodstream around the entire body. Why does it only stimulate the ovary and not the toes or nose?</p>	<p>Answer and explanation to the FSH question.</p> <p>Bell ringer</p> <p>Castle Learning Review</p> <p>Unit Test Questions.</p>
<p>HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of</p>	<p>Organs, Organ systems and how they function independently and together in an organism.</p>	<p>SSBAT identify the organs of the major body systems: circulation,digestive, respiratory, endocrine,</p>	<p>-Manikin lab</p> <p>-Fetal Pig lab</p>	<p>System Bell ringers</p> <p>Manikin lab</p> <p>Fetal Pig Lab</p> <p>ABO Blood Lab</p>

<p>interacting systems that provide specific functions within multicellular organisms. [Clarification Statement: Emphasis is on functions at the organism system level such as nutrient uptake, water delivery, and organism movement in response to neural stimuli. An example of an interacting system could be an artery depending on the proper function of elastic tissue and smooth muscle to regulate and deliver the proper amount of blood within the circulatory system.] [Assessment Boundary : Assessment does not include interactions and functions at the molecular or chemical reaction level.]</p>		<p>nervous, excretory, skeletal, muscle</p>	<p>-ABO blood lab(also reviews genetic concepts) -Memory Maze lab(also reviews the scientific method)</p>	<p>Castle Learning Review Unit Test Questions</p>
<p>HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. [Clarification Statement: Examples of investigations could include heart rate response to exercise, stomata response to moisture and temperature, and root development in response to water levels.] [Assessment Boundary : Assessment does not include the cellular processes involved in the feedback mechanism.]</p>	<p>Homeostasis is maintained by feedback mechanisms within our body-(covered in respiratory and endocrine systems)</p>	<p>SSBAT explain the process of breathing as a negative feedback mechanism. SSBAT explain the process of maintaining blood glucose levels as a negative feedback mechanism. They should be able to explain the roles of insulin, glucose and glucagon in the process.</p>	<p>-NYS Making Connections(also reviews the scientific method) -Breathing essay Blood glucose level chart</p>	<p>Bell ringer -Making Connections lab -Breathing essay -Blood glucose chart Castle Learning Review Unit Test Questions</p>

Reproduction Standard Curriculum Alignment

Subject/Topic: Reproduction

Unit#: 6

Month: April

Standards	Unit/Topic	Essential Knowledge:	Resources Used	Assessment
	Reproduction	What do students		

		absolutely need for the next level?		
HS-LS1-8. Use models to illustrate how human reproduction and development maintains continuity of life. [Clarification Statement: Emphasis is on structures and function of human reproductive systems, interactions with other human body systems, embryonic development, and influences of environmental factors on development.] [Assessment Boundary: Assessment does not include the details of hormonal regulation or stages of embryonic development.]	Male and female reproductive structures	SSBAT identify the male and female structures of the reproductive system.	Guided notes	Reproduction Exam Bell ringer
"	How reproductive structures function	SSBAT explain the functions of the reproductive structures.	Guided notes	Reproduction Exam Bell ringer
HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis [Clarification Statement: Examples of investigations could include heart rate response to exercise, stomate response to moisture and temperature, and root development in response to water levels.] [Assessment Boundary: Assessment does not include the cellular processes involved in the feedback mechanism.]	Menstrual cycle	SSBAT explain the menstrual cycle as a negative feedback mechanism. (essay)	Guided notes Menstrual cycle lab	Reproduction Exam Bell ringer Menstrual Cycle lab
HS-LS1-8. Use models to illustrate how human reproduction and development maintains continuity of life. [Clarification Statement: Emphasis is on structures and	Fertilization and development	SSBAT identify the stages and types of cell division involved in early development	Guided notes	Reproduction Exam Bell ringer

function of human reproductive systems, interactions with other human body systems, embryonic development, and influences of environmental factors on development.] [Assessment Boundary: Assessment does not include the details of hormonal regulation or stages of embryonic development.]		from gametogenesis to gastrula.		
HS-LS1-8. Use models to illustrate how human reproduction and development maintains continuity of life. [Clarification Statement: Emphasis is on structures and function of human reproductive systems, interactions with other human body systems, embryonic development, and influences of environmental factors on development.] [Assessment Boundary: Assessment does not include the details of hormonal regulation or stages of embryonic development.]	Influences on fetal development	SSBAT explain how drugs, alcohol, poor diet and smoking can affect fetal development.	Fetal growth lab Researching this topic.	Reproduction Exam Fetal Growth lab

Ecology-Biology Standard Curriculum Alignment

Subject/Topic: Biology/ Ecology

Unit#: 7

Month: April/May

Standards	Unit/Topic	Essential Knowledge: What do students absolutely need for the next level?	Resources Used	Assessment
Building block information for standard HS-LS2-1. You must understand the parts of an ecosystem before you can make predictions about it.	Ecology Levels of Organization	SSBAT to define: autotroph, heterotroph, saprophyte, herbivore, carnivore, omnivore, individ	Guided notes	Bell ringer Castle learning

		ual, population, community,ecosystem, biome, biosphere, niche and offer an example of each.		
Building block information for standard HS-LS2-1. You must understand the parts of an ecosystem before you can make predictions about it.	Traits of an ecosystem	SSBAT identify biotic and abiotic factors in an ecosystem.	Guided notes	Bell ringer Castle learning
Building block information for standard HS-LS2-1. You must understand the parts of an ecosystem before you can make predictions about it.	Symbiotic Relationships	SSBAT identify which type of symbiotic relationship organisms are in and explain which role each is playing.	Guided notes/chart Youtube video-symbiotic relationships	Bell ringer Castle learning
HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. [Clarification Statement: Emphasis is on quantitative analysis and comparison of the relationships among interdependent factors including boundaries, resources, climate and competition. Examples of mathematical comparisons could include graphs, charts, histograms, and population changes gathered from simulations or historical data sets.] [Assessment Boundary: Assessment does not include deriving mathematical equations to make comparisons.] HS-LS2-2. Use mathematical representations to support and revise	Population Growth Biology	SSBAT distinguish between logistical and exponential growth and predict what factors promote or prevent each type of growth. SSBAT identify factors that may affect the carrying capacity of a population.	Guided notes Population growth lab (P123) Eagle lab	Bell ringer Population growth lab Eagle lab Unit test questions

<p>explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. [Clarification Statement: Examples of mathematical representations include finding the average, determining trends, and using graphical comparisons of multiple sets of data.] [Assessment Boundary: Assessment is limited to provided data.]</p>				
<p>HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. [Clarification Statement: Emphasis is on using a mathematical model of stored energy in biomass to describe the transfer of energy from one trophic level to another and that matter and energy are conserved as matter cycles and energy flows through ecosystems. Emphasis is on atoms and molecules such as carbon, oxygen, hydrogen and nitrogen being conserved as they move through an ecosystem.] [Assessment Boundary: Assessment is limited to proportional reasoning to describe the cycling of matter and flow of energy.]</p>	<p>-Food Chain -Food Web -Energy pyramid -Biomass pyramid -10% Rule</p>	<p>SSBAT create a food web and energy pyramid using the same 10 organisms in the correct trophic levels.</p>	<p>Guided notes Food web Energy pyramid Youtube-Lion King clip</p>	<p>Bell ringer Food web/pyramid Castle learning Unit test questions</p>
<p>HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. [Clarification Statement: Emphasis is on using a mathematical model of stored energy in biomass to describe the transfer of energy from one trophic level to another and that matter and energy are conserved as matter cycles and energy flows through ecosystems. Emphasis</p>	<p>Material Cycles</p>	<p>SSBAT define processes and create drawings depicting the relationship in the water, carbon, nitrogen, sulfur, and phosphorus cycles</p>	<p>Guided notes Cycle drawings Material Cycles ws</p>	<p>Bell ringer Castle learning Cycle drawings Material cycles ws Unit test questions</p>

is on atoms and molecules such as carbon, oxygen, hydrogen and nitrogen being conserved as they move through an ecosystem.] [Assessment Boundary: Assessment is limited to proportional reasoning to describe the cycling of matter and flow of energy.]				
HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. [Clarification Statement: Examples of changes in ecosystem conditions could include modest biological or physical changes, such as moderate hunting or a seasonal flood; and extreme changes, such as volcanic eruption or sea level rise.]	Succession (flora, fauna, water)	SSBAT define succession. They should be able to identify different organisms in succession from pioneer organisms to climax community for both flora and fauna. SSBAT explain how a change in one environment affects the type of organism that can live there.	Guided notes Outdoor example	Bell ringer Castle learning Unit test questions
Building block information for standard HS-LS2-1. You must understand the parts of an ecosystem before you can make predictions about it.	Biomes	SSBAT identify characteristics that constitute a particular biome (climate and climax communities)	Guided notes Biome chart/relay	Bell ringer Castle learning Unit test questions

Human Impact-Biology Standard Curriculum Alignment

Subject/Topic: Biology/ Human Impact

Unit#: 8

Month: May/June

Standards	Unit/Topic Human Impact	Essential Knowledge: What do students absolutely need	Resources Used	Assessment

		for the next level?		
<p>Students who demonstrate understanding can: HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. [Clarification Statement: Emphasis is on quantitative analysis and comparison of the relationships among interdependent factors including boundaries, resources, climate and competition. Examples of mathematical comparisons could include graphs, charts, histograms, and population changes gathered from simulations or historical data sets.] [Assessment Boundary: Assessment does not include deriving mathematical equations to make comparisons.]</p> <p>HS-LS2-8. Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce. [Clarification Statement: Emphasis is on: (1) distinguishing between group and individual behavior, (2) identifying evidence supporting the outcomes of group behavior, and (3) developing logical and reasonable arguments based on evidence. Examples of group behaviors could include flocking, schooling, herding, and cooperative behaviors such as hunting, migrating, and swarming.]</p>	Human Population size and its impact on the environment	SSBAT to identify human population growth as exponential and brainstorm some of the challenges this may present as well as some solutions.	<p>Guided notes</p> <p>Class discussion</p> <p>Yeast lab</p>	<p>Discussion explanations</p> <p>Yeast lab</p>
HS-LS2-7. Design,	Loss of	SSBAT identify	Guided notes	Bell ringer

<p>evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.* [Clarification Statement: Examples of human activities can include urbanization, building dams, and dissemination of invasive species.]</p>	<p>biodiversity and prevention</p>	<p>causes of loss of diversity. SSBAT to explain how loss of diversity has an impact on other factors in the environment as well.</p>	<p>NYS-Loss of Biodiversity Lab</p>	<p>Loss of biodiversity lab Castle learning Unit test questions</p>
<p>HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.* [Clarification Statement: Examples of human activities can include urbanization, building dams, and dissemination of invasive species.]</p>	<p>Impact of Technology and industrialization</p>	<p>SSBAT explain how technology can have a negative impact on the environment and offer potential solutions for: Thermal pollution Nuclear pollution,</p>	<p>Guided notes Nuclear Power Plant Proposal discussion</p>	<p>Bell ringer Discussion explanation Unit test questions</p>
<p>HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.* [Clarification Statement: Examples of human activities can include urbanization, building dams, and dissemination of invasive species.]</p>	<p>Global Environmental Problems facing us -Acid Rain -Global Warming -Ozone Depletion -Loss of Biodiversity</p>	<p>SSBAT explain in essay form:</p> <ul style="list-style-type: none"> • Define the problem, • the cause of the issue, • why do we care, • how do we prevent or solve the problem 	<p>Guided notes Environmental Issues essay/chart</p>	<p>Bell ringer Environmental issue essay/chart Castle learning Review bingo Unit test questions</p>
<p>HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.* [Clarification Statement: Emphasis is on designing solutions for a proposed problem related to threatened or endangered species, or to genetic variation of organisms for multiple species.]</p>	<p>-Trade offs -Environmental Impact Statements</p>	<p>SSBAT explain possible solutions to some of the global challenges we face. SSBAT compose/create an environmental impact</p>	<p>Mining lab and environmental impact statement Create an Ecosystem Project</p>	<p>Bell ringer Mining lab and statement Castle learning Ecosystem project Unit test questions</p>

		<p>statement when presented with a mining challenge (being mindful of the environment and how they will be affecting it.)</p> <p>SSBAT create an ecosystem with producers, primary, secondary and tertiary consumers. Then describe a disturbance and how it will affect each organism. Then create ideas on how to mitigate the problem.</p>		
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