

Ganado Unified School District

BIOLOGY/ GRADE 9th-10th

PACING Guide SY 2014-2015

Timeline & Resources	AZ College and Career Readiness Standard	Essential Question (HESS Matrix)	Learning Goal	Vocabulary (Content/Academic)
<p>1st Quarter</p> <p>Week 1</p> <ul style="list-style-type: none"> • Resource Book • Power Point Presentation • Work Sheets 	<p>Strand 2: History & Nature of Science</p> <p>Concept 1: History of Science as a Human Endeavor</p> <ul style="list-style-type: none"> • Identify individual, culture, & technological contributions to scientific knowledge. <p>P.O. 1: Describe how human curiosity and needs have influenced science, impacting the quality of life worldwide.</p> <p>Concept 2: Nature of Scientific Knowledge</p> <ul style="list-style-type: none"> • Understand how science is a process of generating knowledge. <p>P.O. 1: Specify the requirements of a valid, scientific explanation (theory), including that it be:</p> <ul style="list-style-type: none"> - logical - subject to peer review public - respectful of rules of evidence 	<ul style="list-style-type: none"> • What is biology? • What are possible benefits of studying biology? • What are the characteristics of living things? • What are the characteristics of scientific inquiry? • What are the difference between science and pseudoscience? • Why is scientific literacy important? 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Define biology • Describe the possible benefits of studying biology. • Identify the characteristics of living things • Describe the characteristics of scientific inquiry. • Compare science and pseudoscience. • Describe the importance of scientific literacy. 	<ul style="list-style-type: none"> • Biology • Organism • Organization • Growth • Development • Reproduction • Species • Stimulus • Response • Homeostasis • Adaptation • Science • Law • ethics

<p>Week 2</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 1: Inquiry Process Concept 3: Analysis, Conclusions, and Refinements</p> <ul style="list-style-type: none"> • Evaluate experimental design, analyze data to explain results and propose further investigations. <p>P.O. 1: Interpret data that show a variety of possible relationships between variables.</p>	<ul style="list-style-type: none"> • What are the differences between an observation and an inference? • What are the differences among a control, independent variables and dependent variables? • What are the scientific methods a biologist uses for research? • Why are the metric system and SI important? 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Compare an observation and an inference • Describe and differentiate control, independent variables and dependent variables. • Identify scientific methods that Biological Research? • Describe • The importance of Metric System and SI Unit. 	<ul style="list-style-type: none"> • Observation • Inference • Scientific method • Hypothesis • Experiment • Control group • Experimental group • Independent variable • Dependent variable • Constant • Data • Metric System • SI unit
<p>Week 3</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 3: Interdependence of Organisms.</p> <p>P.O. 2: Describe how organisms are influenced by a particular combination of biotic and abiotic factors in an environment.</p>	<ul style="list-style-type: none"> • What is the difference between abiotic and biotic factors? • What are the interactions between the levels of biological communities? • What is the difference 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Compare biotic and abiotic factors. • Describe the interactions between the levels of biological communities. • Compare habitat and niche. 	<ul style="list-style-type: none"> • Ecology • Biosphere • Biotic factor • Abiotic factor • Population • Biological community • Ecosystem • Biome • Habitat • Niche • Predation

		between an organism's habitat and it's niche?		<ul style="list-style-type: none"> • Symbiotic • Mutualism • Commensalism • Parasitism
<p>Week 4</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 3: Interdependence of organisms. P.O. 1: Identify the relationships among organisms which populations, communities, ecosystems and biome.</p> <p>Concept 5: Matter, Energy, and Organization in Living Systems. P.O. 4: Diagram the energy flow in an ecosystem through a food chain</p> <p>P.O. 3: Diagram the Biochemical cycles in an ecosystem.</p>	<ul style="list-style-type: none"> • What are the producers and consumers in an ecosystem? • How does energy flow through an ecosystem? • What are food chains, food web and ecological pyramid models? • How do nutrients move through biotic and abiotic parts of an ecosystem? • Why are nutrients important to living organisms? • What are the biogeochemical cycles of nutrients and how are they alike? 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Define producer and consumer • Describe how energy flows through an ecosystem • Define food chain and food web. • Compare food chain and food web • Describe ecological pyramid models. • Describe how do nutrients move through biotic and abiotic parts of an ecosystem. • Explain the importance of nutrients to living organisms. • Describe the different biogeochemical cycles. 	<ul style="list-style-type: none"> • Autotroph • Heterotroph • Herbivore • Carnivore • Omnivore • Detritivore • Trophic level • Food chain • Food web • Biomass • Matter • Nutrient • Biochemical cycles • Nitrogen fixation denitrification

<p>Week 5</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 3: Interdependence of Organisms.</p> <p>P.O. 3: Diagram the Biogeochemical Cycles in an ecosystem.</p>	<ul style="list-style-type: none"> • How do unfavorable abiotic and biotic factors affect species? • How do ranges of tolerance affect the distribution of organisms? • What are the stages of primary and secondary succession? • How is latitude related to the three major climate zones? • What are the major abiotic factors that determine the location of terrestrial biome? • How are the terrestrial biomes distinguished based on climate and biotic factors? 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe how do unfavorable abiotic and biotic factors affect species. • Explain how ranges of tolerance affect the distribution of organisms. • Identify the different stages of primary and secondary succession. • Compare primary and secondary successions • Describe how latitude relates to the three major climate zones. • Identify the major biotic factors that determine the location of terrestrial biome. • Distinguish terrestrial biomes based on climate and biotic factors. 	<ul style="list-style-type: none"> • Community • Limiting factor • Tolerance • Ecological succession • Primary succession • Climax community • Secondary succession • Weather • Latitude • Climate • Tundra • Boral forest • Temperate forest • Woodland • Grassland • Desert • Tropical savanna • Tropical seasonal forest • Tropical rainforest
<p>Week 6</p> <ul style="list-style-type: none"> • Resource 	<p>Strand 4: Life Science Concept 3: Interdependence of Organisms</p>	<ul style="list-style-type: none"> • What are the major abiotic factors that 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Identify the major factors that determine the 	<ul style="list-style-type: none"> • Sediment • Littoral zone

<ul style="list-style-type: none"> Book Power Point presentation Worksheets 	<p>P.O. 2: Describe how organisms are influenced by a particular combination of biotic and abiotic factors in an environment.</p>	<p>determine the aquatic ecosystems?</p> <ul style="list-style-type: none"> What are transitional aquatic ecosystems and why are they important? What are the zones of marine ecosystems? What are the characteristics of populations and how they are distributed? 	<p>aquatic ecosystems.</p> <ul style="list-style-type: none"> Describe the transitional aquatic ecosystems. Explain the importance of transitional aquatic ecosystems Identify the zones of marine ecosystems. Describe the characteristics of population and hoe they are distributed. 	<ul style="list-style-type: none"> Limnetic zone Plankton Pro-fundal zone Wetlands Estuary Intertidal zone Photic zone Aphotic zone Benthic zone Abyssal zone population
<p>Week 7</p> <ul style="list-style-type: none"> Resource Book Power Point presentation Worksheets 	<p>Strand 4: Life Science Concept 3: Interdependence of Organisms</p> <p>P.O. 3: Assess how the size and the rate of growth of a population are determined by birth rate, death rate, immigration, emigration, and carrying capacity of the environment.</p>	<ul style="list-style-type: none"> What are the differences between density-independent and density-dependent limiting factors? What are the similarities between the different models used to quantify the growth of a population? How does carrying capacity affect 	<p>I will be able to:</p> <ul style="list-style-type: none"> Compare density-independent and density-dependent limiting factors. Describe the similarities between different models used to quantify the growth of a population. Define carrying capacity. Describe how does carrying capacity affect reproductive rates. Identify the aspects affect human population growth. Describe the trends in 	<ul style="list-style-type: none"> Population density Dispersion Density-independent factor Density-dependent factor Population growth rate Emigration Immigration Carrying capacity Demography Demographic transition

		<p>reproductive rates?</p> <ul style="list-style-type: none"> • What aspects affect human population growth? • What are the trends in human population growth? • What are the age structures of representative non-growing, slowly growing and rapidly growing countries? • What might be the consequences of continued population growth? 	<p>human population growth.</p> <ul style="list-style-type: none"> • Identify the age structures that represent the non-growing, slowly growing and rapidly growing countries. • Predict the consequence of continued population growth. 	<ul style="list-style-type: none"> • Zero population growth • Age structure
<p>Week 8</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 3: Science in Personal and Social Perspectives Concept 1: Changes in Environment P.O.5 : Evaluate the effectiveness of conservation practices and preservation techniques on environmental quality and biodiversity.</p>	<ul style="list-style-type: none"> • What are the three types of biodiversity? • Why is biodiversity important? • What are the direct and indirect values of biodiversity? • What are the 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Identify the three types of biodiversity. • Explain the importance of biodiversity in the ecosystem. • Compare direct and indirect values of biodiversity. • Describe the different threats to biodiversity. 	<ul style="list-style-type: none"> • Extinction • Biodiversity • Genetic diversity • Species diversity • Ecosystem diversity • Background extinction • Mass extinction • Natural resources • Overexploitation

<p>Week 9</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets <ul style="list-style-type: none"> • An article • Test paper 	<p>Strand 3: Science in Personal and Social Perspectives Concept 1: Changes in Environment P.O.5 : Evaluate the effectiveness of conservation practices and preservation techniques on environmental quality and biodiversity.</p> <p>COMMON CORE- CLOSE READING Planning and implementation for</p>	<p>threats to biodiversity?</p> <ul style="list-style-type: none"> • How is the current extinction rate different from the background extinction rate? • How does the decline of a single species affect an entire ecosystem? <ul style="list-style-type: none"> • What are the two classes of Natural Resources? • What are the methods used to conserve biodiversity? • What are the two techniques used to restore biodiversity? <ul style="list-style-type: none"> • What are the unfamiliar words from the article? 	<ul style="list-style-type: none"> • Explain how the current extinction rate different from the background extinction rate. • Describe how does the decline of a single species affect an entire ecosystem. <p>I will be able to:</p> <ul style="list-style-type: none"> • Identify the two classes of Natural Resources. • Describe the methods used to conserve biodiversity. • Name and describe the two techniques used to restore biodiversity. <p>I will be able to:</p> <ul style="list-style-type: none"> • Learn meaning of words and phrases from context 	<ul style="list-style-type: none"> • Habitat fragmentation • Edge effect • Biological magnification • Eutrophication • Introduced species <ul style="list-style-type: none"> • Renewable resources • Nonrenewable resources • Sustainable use • Endemic • Bioremediation • Biological augmentation <p>* It varies depend on the</p>
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	standards and close reading.	<ul style="list-style-type: none"> • What are the evidences from the text? • What are the main ideas and supporting details? 	<p>clues.</p> <ul style="list-style-type: none"> • Annotate text using standard rules for annotating text. • Cite evidence from text • Determine main ideas and supporting details • Write a summary of the article. 	given article
Timeline & Resources	AZ College and Career Readiness Standard	Essential Question (HESS Matrix)	Learning Goal	Vocabulary (Content/Academic)
<p>2nd Quarter</p> <p>Week 1</p> <ul style="list-style-type: none"> • Resource Book • Power Point Presentation • Work Sheets 	<p>Strand 5: Physical Science</p> <p>Concept 1: Structure and Properties of Matter</p> <p>P.O. 6: Describe the features and components of the atom.</p>	<ul style="list-style-type: none"> • What are atoms? • How are the particles that make up atoms diagrammed? • What are the similarities between covalent and ionic bonds? • How van der Waals forces describes? • What are the parts of a chemical reaction? • How can energy changes be related to chemical reactions? • What is the 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Define atom • Describe how the particles that make up atoms diagrammed. • Compare covalent and ionic bonds. • Describe van der Waals forces. • Identify the parts of chemical reaction. • Explain how can energy changes be related to chemical reactions. • Describe the importance of enzyme in living organisms. 	<ul style="list-style-type: none"> • Atom • Nucleus • Proton • Neutron • Electron • Element • Isotope • Compound • Covalent bond • Molecule • Ion • Ionic bond • Van der Waals force • Chemical reaction • Reactant • Product • Activation energy • Catalyst • Enzyme • Substrate • Active site

		importance of enzymes in living organisms?		
<p>Week 2</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 5: Physical Science Concept 1: Structure and Properties of Matter</p> <p>P.O. 1: Describe substances based on their physical properties.</p> <p>P.O. 2: Describe substances based on their chemical properties.</p>	<ul style="list-style-type: none"> • How does the structure of water make it a good solvent? • What are the similarities and differences between solutions and suspensions? • What are the differences between acids and bases? • What is the role of carbon in living organisms? • What are the four major families of biological macromolecules? 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe how does structure of water that make it a good solvent. • Compare solution and suspension. • Compare and describe acids and bases. • Define carbon • Explain the importance of carbon to living organisms • Identify the four major families of biological macromolecules. 	<ul style="list-style-type: none"> • Polar molecule • Hydrogen bond • Mixture • Solution • Solvent • Solute • Acid • Base • pH • buffer • macromolecule • polymer • lipid • protein • amino acid • nucleic acid • nucleotide
<p>Week 3</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 1: The Cell</p> <p>P.O. 1: Describe the role of energy in cellular growth, development, and repair.</p> <p>P.O. 2: Compare the form and function of prokaryotic and</p>	<ul style="list-style-type: none"> • How are the advances in microscope technology related to the discoveries about cells? • What are the 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Compare biotic and abiotic factors. • Describe the interactions between the levels of biological communities. • Compare habitat and niche. 	<ul style="list-style-type: none"> • Cell • Cell theory • Plasma membrane • Organelle • Eukaryotic cell • Nucleus • Prokaryotic cell

	<p>eukaryotic cells and their cellular components.</p>	<p>similarities and differences between compound light microscopes and electron microscopes?</p> <ul style="list-style-type: none"> • What are the principles of the cell theory? • What are the differences between a prokaryotic cell and eukaryotic cell? 		<ul style="list-style-type: none"> • Microscope • Light microscope • Electron microscope
<p>Week 4</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 1: The Cell</p> <p>P.O. 2: Compare the form and function of prokaryotic and eukaryotic cells and their cellular components.</p>	<ul style="list-style-type: none"> • How does a cell's plasma membrane function? • What are the roles of proteins, carbohydrates, and cholesterol in the plasma membrane? • What are the structures of a typical eukaryotic cell, and what are their functions? • What are the 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe the function of plasma membrane. • Describe the roles of proteins, carbohydrates, and cholesterol in the plasma membrane. • Identify the parts and function of typical eukaryotic cell. • Compare plant and animal cells. 	<ul style="list-style-type: none"> • Selective permeability • Phospholipid bilayer • Transport protein • Fluid mosaic model • Cytoplasm • Cytoskeleton • Ribosomes • Nucleolus • Endoplasmic reticulum • Golgi apparatus • Vacuole • Lysosome

		similarities and differences between plant and animal cells?		<ul style="list-style-type: none"> • Centrioles • Mitochondrion • Chloroplast • Cell wall • Cilium • flagellum
<p>Week 5</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 1: The Cell</p> <p>P.O. 4: Analyze mechanisms of transport of materials into and out of cells: - Passive transport - Active transport</p> <p>P.O. 1: Describe the role of energy in cellular growth, development, and repair.</p>	<ul style="list-style-type: none"> • What are the processes of diffusion, facilitated diffusion, and active transport? • What is the effect of hypotonic, hypertonic, or isotonic solution on a cell? • How do large particles enter and exit cells? • What are the two laws of thermodynamics ? • What is the difference between an anabolic pathway and a catabolic pathway? • How does ATP work in a cell? 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe the processes of diffusion, facilitated diffusion and active transport. • Demonstrate the effect of hypotonic, hypertonic and isotonic solution to cell. • Describe how large particles enter and exit the cells. • Identify the two laws of thermodynamics. • Compare anabolic pathway and catabolic pathway. • Explain the importance of ATP to cell. 	<ul style="list-style-type: none"> • Diffusion • Dynamic equilibrium • Facilitated diffusion • Osmosis • Isotonic solution • Hypotonic solution • Hypertonic solution • Active transport • Endocytosis • Exocytosis • Energy • Thermodynamics • Metabolism • Photosynthesis • Cellular respiration • Adenosine triphosphate (ATP)
Week 6	Strand 4: Life Science Concept 5: Matter, Energy, and	<ul style="list-style-type: none"> • What are the two phases of 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Identify the two phases 	<ul style="list-style-type: none"> • Thylakoid

<ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Organization in Living Systems P.O. 1: Compare the processes of photosynthesis and cellular respiration in terms of energy flow, reactants, and products.</p>	<p>photosynthesis?</p> <ul style="list-style-type: none"> • What is the function of a chloroplast during the light reactions? • How can electron transport be describes and diagrammed? • What are the stages of cellular respiration? • What is the role of electron carriers in each stage of cellular respiration? • What are the similarities between alcoholic fermentation and lactic fermentation? 	<p>of photosynthesis.</p> <ul style="list-style-type: none"> • Explain the function of chloroplast during light reactions. • Describe how electron is being transport. • Identify the different stages of cellular respiration. • Describe the role of electron carriers in each stage of cellular respiration • Compare alcoholic fermentation and lactic fermentation. 	<ul style="list-style-type: none"> • Granum • Stroma • Pigment • NADP • Calvin cycle • Rubisco • Anaerobic process • Aerobic respiration • Aerobic process • Glycolysis • Krebs cycle • fermentation
<p>Week 7</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 1: The Cell</p> <p>P.O. 1: Describe the role of energy in cellular growth, development, and repair.</p>	<ul style="list-style-type: none"> • Why are cells relatively small? • What are the primary stages of the cell cycle? • What are the stages of interphase? • What are the 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Explain why are cells relatively small. • Describe the primary stages of the cell cycle. • Identify the stages of interphase. • Describe the events of each stage of mitosis. 	<ul style="list-style-type: none"> • Cell cycle • Interphase • Mitosis • Cytokinesis • Chromosome • Chromatin • Prophase • Sister chromatid

		<p>events of each stage of mitosis?</p> <ul style="list-style-type: none"> • What is the process of cytokinesis? • What is the role of cyclin proteins in controlling the cell cycle? • What is the role of apoptosis? • What are the two types of stem cells and what are their potential uses? 	<ul style="list-style-type: none"> • Define cytokinesis • Describe the process of cytokinesis • Identify the role of cyclin proteins in controlling the cell cycle. • Define apoptosis • Describe the two types of stem cells and their uses. 	<ul style="list-style-type: none"> • Centromere • Spindle apparatus • Metaphase • Anaphase • Telophase • Cyclin • Cyclin-dependent kinase • Cancer • Carcinogen • Apoptosis • Stem cell
<p>Week 8</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 2: Molecular Basis of Heredity P.O. 4: Describe how meiosis and fertilization maintain genetic variation</p>	<ul style="list-style-type: none"> • How does the reduction in chromosome number occur during meiosis? • What are the stages of meiosis? • What is the importance of meiosis in providing genetic variation? • What is the significance of Mendel's experiments to the study of 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe how the reduction in chromosome number occur during meiosis. • Identify the stages of meiosis. • Explain the importance of meiosis in providing genetic variation. • Describe the significance of Mendel's experiments to the study of genetics. • Define law of segregation and law of independent assortment • Define and describe Punnett Square 	<ul style="list-style-type: none"> • Gene • Homologous chromosome • Gamete • Haploid • Fertilization • Diploid • Meiosis • Crossing over • Genetics • Allele • Dominant • Recessive • Homozygous • Heterozygous • Genotype • Phenotype

<p>Week 9</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets <ul style="list-style-type: none"> • An article • Test paper 	<p>Strand 4: Life Science Concept 2: Molecular Basis of Heredity P.O. 4: Describe how meiosis and fertilization maintain genetic variation</p> <p>COMMON CORE- CLOSE READING Planning and implementation for standards and close reading.</p>	<p>genetics?</p> <ul style="list-style-type: none"> • What is the law of segregation and the law of independent assortment? • What are the possible offspring from a cross using a Punnett square? <ul style="list-style-type: none"> • How does the process of meiosis produce genetic recombination? • How can gene linkage be used to create chromosome maps? • Why is polyploidy important to the field of agriculture? <ul style="list-style-type: none"> • What are the unfamiliar words from the article? • What are the 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe how does the process of meiosis produce genetic recombination. • Explain gene linkage be used to create chromosome maps. • Explain polyploidy important to the field of agriculture. <p>I will be able to:</p> <ul style="list-style-type: none"> • Learn meaning of words and phrases from context clues. • Annotate text using standard rules for annotating text. • Cite evidence from text • Determine main ideas and supporting details 	<ul style="list-style-type: none"> • Law of segregation • Hybrid • Law of independent assortment <ul style="list-style-type: none"> • Genetic recombination • Polyploidy <p>* It varies depend on the given article</p>
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		<p>evidences from the text?</p> <ul style="list-style-type: none"> • What are the main ideas and supporting details? 	<ul style="list-style-type: none"> • Write a summary of the article. 	
Timeline & Resources	AZ College and Career Readiness Standard	Essential Question (HESS Matrix)	Learning Goal	Vocabulary (Content/Academic)
<p>3rd Quarter</p> <p>Week 1</p> <ul style="list-style-type: none"> • Resource Book • Power Point Presentation • Work Sheets 	<p>Strand 4: Life Science Concept 2: Molecular Basis of Heredity</p> <p>P.O. 2: Describe the molecular basis of heredity, in viruses and living things, including DNA replication and protein synthesis.</p>	<ul style="list-style-type: none"> • How can genetic patterns be analyzed to determine dominant or recessive inheritance patterns? • What are examples of dominant and recessive disorders? • How can human pedigrees be constructed from genetic information? • What are the differences between various complex inheritance patterns? • How can sex- 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe genetic pattern that determine dominant or recessive inheritance patterns. • Name examples of dominant and recessive disorders. • Explain how human pedigrees be constructed from genetic variation • Describe the different complex inheritance pattern. • Explain how can sex-linked inheritance patterns be analyzed. 	<ul style="list-style-type: none"> • Carrier • pedigree • Incomplete dominance • Codominance • Multiple alleles • Epistasis • Sex chromosome • Autosome • Sex-linked trait • Polygenic trait

		<p>linked inheritance patterns be analyzed?</p> <ul style="list-style-type: none"> • How can the environment influence the phenotype of an organism? 		
<p>Week 2</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 2: Molecular Basis of Heredity</p> <p>P.O. 3: Explain how genotypic variation occurs and results the phenotypic diversity.</p>	<ul style="list-style-type: none"> • How are karyotypes used to study genetic disorders? • What is the role of telomeres? • How is nondisjunction related to Down syndrome and other abnormal chromosome numbers? • What are the benefits and risks of diagnostic fetal testing? • Which experiments led to the discovery of DNA as the genetic material? • What is the basic structure of DNA? 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Define karyotypes and it's importance in the study of genetic disorders. • Describe telomeres. • Relate nondisjunction to Down syndrome and other abnormal chromosome numbers. • Explain the benefits and risks of diagnostic fetal testing. • Identify the experiments that led to the discovery of DNA as the genetic material. • Describe the basic structure of DNA. • Identify the basic structure of eukaryotic chromosomes. 	<ul style="list-style-type: none"> • Karyotype • Telomere • Nondisjunction • Double helix • nucleosome

		<ul style="list-style-type: none"> • What is the basic structure of eukaryotic chromosomes? 		
<p>Week 3</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 2: Molecular Basis of Heredity P.O. 1: Analyze the relationships among nucleic acids (DNA,RNA), genes, and chromosomes</p> <p>P.O. 2: Describe the molecular basis of heredity, in viruses and living things, including DNA replication and protein synthesis.</p>	<ul style="list-style-type: none"> • What is the role of enzymes in the replication of DNA? • How are leading and lagging strands synthesized differently? • How does DNA replication compare in eukaryotes and prokaryotes? • How are messenger RNA, ribosomal RNA, and transfer RNA involved in the transcription and translation of genes? • What is the role of RNA polymerase in the synthesis of messenger RNA? • How is the code of DNA translated into 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe the role of enzymes in the replication of DNA. • Explain how are leading and lagging strands synthesized differently. • Compare DNA replication of eukaryotes and prokaryotes. • Explain how mRNA, rRNA and tRNA involved in the transcription and translation of genes. • Describe the role of RNA polymerase in the synthesis of mRNA? • Explain how is the code of DNA translated into mRNA and utilized to synthesize a protein. 	<ul style="list-style-type: none"> • Semiconservative replication • DNA polymerase • Okazaki fragment • RNA • Messenger RNA • Ribosomal RNA • Transfer RNA • Transcription • RNA polymerase • Intron • Exon • Codon • Translation

		<p>messenger RNA and utilized to synthesize a protein?</p>		
<p>Week 4</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 2: Molecular Basis of Heredity</p> <p>P.O. 1: Analyze the relationships among nucleic acids (DNA, RNA), genes, and chromosomes.</p> <p>P.O. 3: Explain how genotypic variation occurs and results in phenotypic diversity.</p>	<ul style="list-style-type: none"> • How are bacteria able to regulate their genes by two types of operons? • How do eukaryotes regulate the transcription of genes? • What are the various types of mutations? • How is selective breeding used to produce organisms with desired traits? • What are similarities and differences between inbreeding and hybridization? • How does a Punnett square test cross help assess the genotypes of organisms? 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe how bacteria regulates their genes by two types of operons. • Describe how eukaryotes regulate the transcription of genes. • Identify the various types of mutations. • Explain how selective breeding used to produce organisms with desired traits. • Compare inbreeding and hybridization. • Explain how Punnett square test cross help assess the genotypes of organisms. 	<ul style="list-style-type: none"> • Gene regulation • Operon • Mutation • Mutagen • Selective breeding • Inbreeding • Test cross

<p>Week 5</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 2: Molecular Basis of Heredity</p> <p>P.O. 3: Explain how genotypic variation occurs and results in phenotypic diversity.</p>	<ul style="list-style-type: none"> • What are the different tools and processes used in genetic engineering? • How does genetic engineering manipulate recombinant DNA? • What are the similarities between selective breeding and genetic engineering? • How can genetic engineering and biotechnology be used to improved human life? 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe the different tools and processes used in genetic engineering. • Explain how genetic engineering manipulate recombinant DNA. • Compare selective breeding and genetic engineering? • Explain how genetic engineering and biotechnology be used to improved human life. 	<ul style="list-style-type: none"> • Genetic engineering • Genome • Restriction enzyme • Gel electrophoresis • Recombinant DNA • Plasmid • DNA ligase • Transformation • Cloning • Polymerase chain reaction • Transgenic organism
<p>Week 6</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 2: Molecular Basis of Heredity</p> <p>P.O. 3: Explain how genotypic variation occurs and results in phenotypic diversity.</p>	<ul style="list-style-type: none"> • What are the components of the human genome? • How do forensic scientists use DNA fingerprinting? • How can information from the human 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Identify the components of the human genome. • Explain how forensic scientists use DNA fingerprinting. • Describe how can information from the human genome be used to treat human diseases. 	<ul style="list-style-type: none"> • DNA fingerprinting • Bioinformatics • DNA microarray • Single nucleotide polymorphism • Haplotype • Pharmacogenomics • Gene therapy • Genomics

		genome be used to treat human diseases?		<ul style="list-style-type: none"> proteomics
<p>Week 7</p> <ul style="list-style-type: none"> Resource Book Power Point presentation Worksheets 	<p>Strand 4: Life Science Concept 4: Biological Evolution</p> <p>P.O. 3: Describe how the continuing operation of natural selection underlies a population's ability to adapt to changes in the environment and leads to biodiversity and the origin of new species.</p>	<ul style="list-style-type: none"> How do the characteristics of plants and green algae compare? What are the adaptations of plants to land environments? What is the importance of vascular tissue to plant life on land? What is the alternation of generations of plants? What are divisions of the plant kingdom? 	<p>I will be able to:</p> <ul style="list-style-type: none"> Compare the characteristics of plants and green algae. Identify the adaptations of plants to land environment. Explain the importance of vascular tissue to plant life on land. Describe the alternation of generations of plants. Identify the divisions of plant kingdom. 	<ul style="list-style-type: none"> Stomata vascular tissue vascular plant nonvascular plant seed
<p>Week 8</p> <ul style="list-style-type: none"> Resource Book Power Point presentation Worksheets 	<p>Strand 4: Life Science Concept 4: Biological Evolution</p> <p>P.O. 3: Describe how the continuing operation of natural selection underlies a population's ability to adapt to changes in the environment and leads to biodiversity and the origin of new species</p>	<ul style="list-style-type: none"> What are the major types of plant cells? What are the major types of plant tissues? What are the differences among the functions of plant cells and tissues? 	<p>I will be able to:</p> <ul style="list-style-type: none"> Describe the different types of plant cells. Identify the major types of plant tissues. Compare the functions of plant cells and tissues. 	<ul style="list-style-type: none"> Parenchyma cell Collenchyma cell Sclerenchyma cell Meristem Vascular cambium Cork cambium Epidermis Guard cell

<p>Week 9</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Strand 4: Life Science Concept 4: Biological Evolution</p> <p>P.O. 3: Describe how the continuing operation of natural selection underlies a population’s ability to adapt to changes in the environment and leads to biodiversity and the origin of new species</p>	<ul style="list-style-type: none"> • How are the structures of roots, stems, and leaves related to their functions? • How do the structures and functions of roots, stems, and leaves compare? 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe how structures of roots, stems, and leaves related to their functions. • Explain how the structures and functions of roots, stems and leaves compare. 	<ul style="list-style-type: none"> • Xylem • vessel element • Tracheid • Phloem • Sieve tube member • Companion cell • Ground tissue
<p>Week 10</p> <ul style="list-style-type: none"> • An article • Test paper 	<p>COMMON CORE- CLOSE READING</p> <p>Planning and implementation for standards and close reading.</p>	<ul style="list-style-type: none"> • What are the unfamiliar words from the article? • What are the evidences from the text? • What are the main ideas and supporting details? 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Learn meaning of words and phrases from context clues. • Annotate text using standard rules for annotating text. • Cite evidence from text • Determine main ideas and supporting details • Write a summary of the article. 	<ul style="list-style-type: none"> • Root cap • Cortex • Endodermis • Pericycle • Petiole • Palisade mesophyll • Spongy mesophyll • transpiration <p>* It varies depend on the given article</p>

Timeline & Resources	AZ College and Career Readiness Standard	Essential Question (HESS Matrix)	Learning Goal	Vocabulary (Content/Academic)
<p>4th Quarter</p> <p>Week 1</p> <ul style="list-style-type: none"> • Resource Book • Power Point Presentation • Work Sheets 	<p>Concept 4: Biological Evolution Understand the scientific principles and processes involved in biological evolution.</p> <p>P.O. 1: Identify the components of natural selection which can be lead to speciation</p>	<ul style="list-style-type: none"> • What is Evolution? • What are the three geological theories? • Who is Charles Darwin? How does he arrive at his idea about species variation? • How Darwin discoveries supported ancient Earth history? 	<p>I will able to:</p> <ul style="list-style-type: none"> • Examine early ideas about evolution. • Identify three geological theories that influenced scientific debate over evolution. • Describe how Darwin arrived at his idea about species variation. • Recognize how Darwin’s discoveries supported Lyell’s ancient-Earth theory. 	<ul style="list-style-type: none"> • Evolution • Species • Fossil • Catastrophism • Gradualism • Uniformitarianism • Variation • Adaptation
<p>Week 2</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Concept 4: Biological Evolution Understand the scientific principles and processes involved in biological evolution.</p> <p>P.O. 1: Identify the components of natural selection which can be lead to speciation</p>	<ul style="list-style-type: none"> • What is the difference between artificial selection and natural selection? • What are the four principles of Natural Selection? • How does the major sources affect the evidence of evolution? • What are the different types of evidence that 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Compare artificial selection to natural selection. • Examine the factors Darwin considered in forming his theory of Natural Selection. • Summarize the four principles of Natural Selection • Recognize the major sources of evidence for evolution. • Examine the pattern of features that reveal the history of a species. 	<ul style="list-style-type: none"> • Artificial Selection • Heritability • Natural Selection • Population • Fitness • Biogeography • Homologous structure • Analogous structure • Vestigial structure • Paleontology

		support evolution?	<ul style="list-style-type: none"> Summarize different types of evidence that support evolution. 	
<p>Week 3</p> <ul style="list-style-type: none"> Resource Book Power Point presentation Worksheets 	<p>Concept 4: Biological Evolution Understand the scientific principles and processes involved in biological evolution.</p> <p>P.O. 2: Explain how genotypic and phenotypic variation can result in adaptations that influence an organism's success in an environment.</p>	<ul style="list-style-type: none"> What is the importance of evolution? What is the significance of genetic variation within a population? How Natural Selection acts on distribution of traits in a population? How gene flow, genetic drift and sexual selection can lead to the evolution of population? 	<p>I will be able to:</p> <ul style="list-style-type: none"> Recognize the importance of evolution in unifying all branches of biological study. Describe the significance of genetic variation within a population. Identify sources of genetic variation Describe how natural selection acts on the distribution of traits in a population. Explain three ways natural selection can change the distribution of a trait in a population. Explain how gene flow, genetic drift, and sexual selection can lead to the evolution of population. 	<ul style="list-style-type: none"> Gene pool Allele frequency Microevolution Directional selection Stabilizing selection Disruptive selection Gene flow Genetic drift Bottleneck effect Founder effect Sexual selection
<p>Week 4</p> <ul style="list-style-type: none"> Resource Book Power Point presentation Worksheets 	<p>Concept 4: Biological Evolution Understand the scientific principles and processes involved in biological evolution.</p> <p>P.O. 3: Describe how the continuing operation of Natural Selection underlies a population's ability to</p>	<ul style="list-style-type: none"> What is Hardy-Weinberg equilibrium? What are the condition and predictive value of the Hardy-Weinberg 	<p>I will be able to:</p> <ul style="list-style-type: none"> Identify the conditions that define Hardy-Weinberg equilibrium. Explain the predictive value of Hardy-Weinberg equation. Explain how isolation of 	<ul style="list-style-type: none"> Hardy-Weinberg equilibrium Reproductive isolation Speciation Behavioral isolation Geographic

	<p>adapt to changes in the environment and leads to biodiversity and the origin of new species.</p>	<p>equation?</p> <ul style="list-style-type: none"> • How isolation of populations can lead to speciation? • What are the different types and rates of evolution? • What is extinction? What are the different types and rates of extinction? 	<p>populations can lead to speciation.</p> <ul style="list-style-type: none"> • Describe how populations can become isolated. • Describe different types and rates of evolution • Compare different types and rates of extinction. 	<p>isolation</p> <ul style="list-style-type: none"> • Temporal isolation • Convergent evolution • Divergent evolution • Coevolution • Extinction • Punctuated equilibrium • Adaptive radiation
<p>Week 5</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Concept 4: Biological Evolution Understand the scientific principles and processes involved in biological evolution.</p> <p>P.O. 5: Analyze how patterns in the fossil record, nuclear chemistry, geology, molecular biology and geographical distribution give support to the theory of organic evolution through natural selection over billions of years and the resulting present day biodiversity.</p>	<ul style="list-style-type: none"> • What is fossil? How fossils can form? • What is the difference between relative dating and absolute dating techniques? • What is geologic time scale? • What is the condition on Earth billions of years ago? • What are the different hypotheses of how life begun 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe the ways that fossils can form. • Identify the use of relative dating and absolute dating techniques. • Recognize the role of index fossils in determining the age of rocks. • Identify the major intervals of the geologic time scale. • Describe the conditions on Earth billions of years ago. • Summarize the main hypotheses of how life 	<ul style="list-style-type: none"> • Relative dating • Radiometric dating • Isotope • Half life • Index fossil • Geologic time scale • Era • Period • Epoch • Nebula • Ribozyme • Cyanobacteria • endosymbiosis

		on Earth?	began on Earth. <ul style="list-style-type: none"> Recognize the role of microbes played in shaping life on Earth. 	
<p>Week 6</p> <ul style="list-style-type: none"> Resource Book Power Point presentation Worksheets 	<p>Concept 4: Biological Evolution Understand the scientific principles and processes involved in biological evolution.</p> <p>P.O. 4: Predict how a change in an environmental factor can affect the number and diversity of species in an ecosystem.</p>	<ul style="list-style-type: none"> What is endosymbiosis theory? How will you relate increased biodiversity to sexual reproduction? What are the key events in the Paleozoic, Mesozoic, and Cenozoic Eras? How changes in environmental conditions affect the evolution and radiation of animal groups? What are the events and forces that shaped human evolution? 	<p>I will be able to:</p> <ul style="list-style-type: none"> Summarize the theory of endosymbiosis. Relate increased biodiversity to sexual reproduction. Summarize the key events in the Paleozoic, Mesozoic, and Cenozoic eras. Identify how changes in environmental conditions affected the evolution and radiation of animal groups. Examine the evolutionary relationships between humans and other primates. Recognize the names and relative ages of extinct hominids. Summarize the events and forces that shaped human evolution. 	<ul style="list-style-type: none"> Paleozoic Cambrian explosion Mesozoic Cenozoic Primate Prosimian Anthropoid Hominid Bipedal
<p>Week 7</p> <ul style="list-style-type: none"> Resource Book 	<p>Concept 4: Biological Evolution Understand the scientific principles and processes involved in biological evolution.</p>	<ul style="list-style-type: none"> Who is Carolus Linnaeus? What is the scientific naming system 	<p>I will be able to:</p> <ul style="list-style-type: none"> Examine the scientific naming system developed by Linnaeus. 	<ul style="list-style-type: none"> Taxonomy Taxon Binomial Nomenclature

<ul style="list-style-type: none"> • Power Point presentation • Worksheets 	<p>P.O. 6: Analyze using a biological classification system, the degree of relatedness among various species.</p>	<p>developed by Linnaeus?</p> <ul style="list-style-type: none"> • What is cladistics? • How molecular evidence reveals species relatedness? • What are the two types of molecular clocks? • What are the 3 domains in the tree of life? 	<ul style="list-style-type: none"> • Identify the limitations of the Linnaeus system. • Describe classification by cladistics. • Summarize how molecular evidence reveals species relatedness. • Describe two types of molecular clocks: mitochondrial DNA and ribosomal RNA. • Describe classification as a work in progress. • Identify the three domains in the tree of life as Bacteria, Archaea, and Eukarya? 	<ul style="list-style-type: none"> • Genus • Phylogeny • Cladistics • Cladogram • Derived character • Molecular clock • Mitochondrial DNA • Ribosomal RNA • Bacteria • Archaea • Eukarya •
<p>Week 8</p> <ul style="list-style-type: none"> • Resource Book • Power Point presentation • Worksheets 	<p>Concept 4: Biological Evolution Understand the scientific principles and processes involved in biological evolution.</p> <p>P.O. 6: Analyze using a biological classification system, the degree of relatedness among various species.</p>	<ul style="list-style-type: none"> • How animals comprise a diverse kingdom? • What are the characteristics of animals? • What are the unique body plans of the animal phyla? • How Genetics reveals the evolutionary history of 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Describe how animals comprise a diverse kingdom • Identify the defining characteristics of animals. • Describe the unique body plans of the animal phyla. • Describe the criteria used to group animals. • Explain how Genetics reveals the evolutionary history of animals. 	<ul style="list-style-type: none"> • Collagen • Homeotic • Homeobox • Vertebrate • Invertebrate • Phylum • Bilateral symmetry • Radial symmetry • Protostome • Deuterostome

<p>Week 9</p> <ul style="list-style-type: none"> • An article • Test paper 	<p>COMMON CORE- CLOSE READING Planning and implementation for standards and close reading.</p>	<p>animals?</p> <ul style="list-style-type: none"> • What are the unfamiliar words from the article? • What are the evidence from the text? • What are the main ideas and supporting details? 	<p>I will be able to:</p> <ul style="list-style-type: none"> • Learn meaning of words and phrases from context clues. • Annotate text using standard rules for annotating text. • Cite evidence from text • Determine main ideas and supporting details • Write a summary of the article. 	<p>* varies depend on the given article</p>
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