A Scientific Inquiry

u								
	Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
g	How can I correctly set up and run an experiment?	Inquiry lab guidelines	Design and implement an inquiry based lab.	Independent variables	Teacher Summative - Lab Analysis		Investigating Biology Lab Manual	3.2.11.A-Evaluate the nature of scientific and technological knowledge.
u	experiment?			Dependent variables			Mariuar	3.2.11.B-Evaluate experimental information for appropriateness and
S	What data should be collected and how should this be analyzed?			Controlled variables				adherence to relevant science process. 3.2.11.C-Apply the elements of scientific inquiry to solve multi-step problems.
t		Data collection and analysis		Control				
S	Biochemistry							
е								
	Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
р	How essential is water?	Properties of water	List and explain the major properties of water.	Electronegativity	Teacher Summative - pH lab		pH Lab	3.2.12.C-Apply the elements of scientific inquiry to solve multi-step problems.
t				Polar Bonds	Teacher Summative - Water Essay			3.3.12.B-Analyze the chemical and structural basis of living organisms.
e		pH scale	Experiment and explain the changes that occur with pH in both organic and inorganic substances.	Cohesion			Essays from old AP Exams	3.4.12.A-Apply concepts about the structure and properties of matter.
m			U U	Adhesion				3.7.12.A-Apply advanced tools, materials and techniques to answer complex questions.
b				Surface Tension				
е				Capillary Action				
r				Evapoartive Cooling Heat of Vaporization				
	Biochemistry							
	Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
	What role does carbon	Carbon and	Understand the major	organic	Teacher Summative -		Molecular Kits	3.2.12.C-Apply the elements of scientific
	play in living things?	organic chemistry	characteristics of carbon and		quiz on			inquiry to solve multi-step problems.
			the importance of organic		macromolecules			
			chemistry.					

How do biochemical molecules differ from molecules in physical chemistry?			isomer	Teacher Summative - Organic Molecule Lab		3.3.12.A-Explain the relationship between structure and function at all levels of organization.
		Identify various functional groups.	enantiomer	Case Study	Organic Molecule Identification Lab	3.3.12.B-Analyze the chemical and structural basis of living organisms.
What groups of biological molecules are necessary for each life process?	Functional groups		monomer	Teacher Summative - Formal Lab Report - Enzymes	Case Study	
		Describe the process behind macromolecule formation.	polymer	Common Summative - Biochemistry Unit Test		
How do organisms obtain and use energy to survive in their environment?	Formation of macromolecules		dehydration synthesis			
		Provide examples of mono, di, and polysaccharides.	hydrolysis			
	Carbohydrates	Understand and explain the necessity of carbohydrates to living things.	monosaccharide disaccharide			
	Lipids	Recognize the various types of lipids and their structure.	glycosidic linkage polysaccharide			
	Proteins	Describe the structure of	starch cellulose			
	Nucleic Acids	proteins.	amylose			
		Explain how the structure of proteins determines its function.	amylopectin			
	Enzymes		chitin			
	Free Energy	Identify nucleic acids and explain their structure.	lipid			
		Evaluate knowledge on organic molecules be being able to label various examples.	triglycerides saturated			
		Perform lab on enzymes rate of reaction	unsaturated amino acid			
			peptide bond denaturation			

chaperonins nucleotide DNA RNA pyrimidine purine double helix antiparallel Active site Metabolism Anabolic Catabolic Inhibition **Competitive Inhibition** Noncompetitive Inhibition Allosteric Regulation Feedback Inhibition Energy Thermodynamics Exergonic Endergonic Free Energy Gibbs Entropy Enthalpy Substrate

O Cell Structure and

 nr	****	nn.

С								
	Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
t	What is the basic	Prokaryotic cells	Distinguish between	Nucleoid	Teacher Summative -		Lab 1 - Osmosis	3.2.12.B-Evaluate experimental
	structure of the cell?		prokaryotic and eukaryotic		Microscope Cell Lab		and Diffusion	information for appropriateness and
			cells.					adherence to relevant science processes.
0				Nucleus	Teacher Summative -			3.2.12.C-Apply the elements of scientific
					Osmosis and Diffusion			inquiry to solve multi-step problems.
					Lab			
b	In which ways are the	Eukaryotic cells	Describe the structure and	SER	Common Summative -		Essays from old	3.3.12.A-Explain the relationship
	structure and function		function of organelles found		Cell Project with		AP Exams	between structure and function at all
	of cells dependent upon chemical principles?		in eukaryotic plant and animal cells.		Organelle Homeostasis			levels of organization.
e				RER	Common Summative -			
					Test			

r	How do organisms maintain a biological balance between their internal and external environments?	Organelles' structure and function	Label both a plant and animal eukaryotic cell.	Cytoplasm	Cell Project
		Cell Transport	Provide specific examples of active and passive cell transport.	Cell membrane Cell wall	
		Osmolarity	Compare both active and passive transport across a	Golgi Ribosomes	
			cell.	Chromatin	
		Cell Size	Explain how cells can maintain homeostasis through the process of osmolarity.	Chromosome	
			Perform an experiment to measure diffusion and osmosis through cells under various conditions	Lysosomes Peroxisomes	
			Determine the relationship	Flagella Cilia	
			between cell size and surface area.		
				Microvilli Vacoule Centrioles	
				Centrosome	
				Chloroplasts Mitochondria	
				Endosymbiont Theory	
				Glycoproteins	
				Phospholipid Bilayer	
				Peripheral Protein	
				Cholesterol	
				Hypertoni	
				Hypotonic	
				Isotonic Osmosis	
				Diffusion	
				Facilitated Diffusion	
				Active Transport Passive Transport	

Carrier Proteins Turgid Lyse Plasmolysis Flaccid Water Potential Solute Potential Endocytosis Exocytosis Receptor Mediated Endocytosis Na+ K+ Pump

Ν	Bioenergetics

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	Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
v	How do organisms	Structure of the	Explain how the energy flow	Cellular Respiration	Teacher Summative -		Lab 5 - Cellular	3.2.12.C-Apply the elements of scientific
	obtain and use energy	mitochondria	of biochemical reactions is		Cellular Respiration Lab		Respiration	inquiry to solve multi-step problems.
	to survive in their		governed by the physical					
	environment?		laws of thermodynamics.					
е				Fermentation	Teacher Summative -		Lab 4 -	3.3.12.A-Explain the relationship
					Photosynthesis Lab		Photosynthesis	between structure and function at all
								levels of organization.
m		Cellular		Aerobic	Teacher Summative -			3.3.12.B-Analyze the chemical and
		Respiration -			Quiz			structural basis of living organisms.
		stages						
b			Explain the idea of free	Anaerobic	Common Summative -			
			energy.		Test			
е		Fermentation	Determine if a reaction is	Mitochondria				
			endergonic or exergonic.					
r			Explain the structure and	Matrix				
			function of ATP and how					
			ATP drives life processes					
			through coupled reactions.					
		Structure of the	Summarize the role enzymes	Cristae				
		chloroplast	, play in chemical reactions.					
			Perform an experiment to	Glycolysis				
			determine how enzymes					
			effect reaction rates.					
		Photosynthesis -		Oxidation				
		stages						
			Describe in great detail the	Reduction				
			structure of the					
			mitochondria					
		Cyclic and		Krebs				
		Noncyclic Cycles						
		Noncyclic Cycles						

Understand the various Oxydative stages of cellular respiration. Phosphorylation

Photorespiration, CAM plants, C₄ plants

> Summarize how cellular NADH respiration is the process by which potential chemical energy in the bonds of glucose is transformed into potential chemical energy in the bonds of ATP.

Factors that	Compare and contrast	FADH2
affect	respiration and	
photosynthesis	fermentation.	
		ATP
Data	Perform an experiment to	Electron Transport Chain

Interpretation measure cellular respiration.

Photosynthesis

Chemiosmosis

Describe in great detail the Chloroplast structure of the chloroplast.

Stroma

Understand the various Thylakoid stages of photosynthesis.

Granum

Explain how photosynthesis Light Reactions is the process that transforms light energy into potential chemical energy upon which all life subsequently depends.

Compare and contrast cyclic Calvin Cycle and noncyclic pathways.

NADPHExplain how CAM and C4Carbon Flxationplants performCarbon Flxationphotosynthesis.C3Perform an experiment toC4determine how variousC4factors affectLange Carbonphotosynthesis.CAM

D Cell Communication

e	Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons Resources	Standards
с	How do cells communicate to have an effective, appropriate response?	Cell reception and response	Explain the pathways of cell communication through intercellular receptors - G protein, tyrosine kinase, ion channel receptors.	G Protein	Complete online cell communication unit	Online Unit on Moodle	3.6.11.B-Analyze knowledge of information technologies of encoding, transmitting, receiving, storing, retrieving and decoding.
e		Local versus Distance Signaling	Summarize how local signaling occurs in a cell.	Tyrosine Kinase	Teacher Summative - Cell communication quiz		
m			Determine the pathway of a steroid across a membrane and the effect the steroid has on gene expression.	lon channels	Teacher Summative - Defective Pathway Project Infographics		
b				Phosphorylation			
e				Kinase	Common Summative - Homeostatsis Pathway Project		
r				Paracrine Autocrine Neuron Synapse Secondary messenger Signal transduction pathway Cascade protein Scaffolding proteins Adenyl cyclase			
				Apoptosis Quorum sensing			

Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
Why is DNA considered	Discovery of DNA	Explain the major	Transformation	Teacher Summative -		WIley Animation	3.1.11.C-Assess and apply patterns in
the blueprint of life?		experiments that showed		DNA Quiz			science and technology.
		DNA was the genetic					
		material.					
	DNA structure	Determine the structure of	Avery			Molecular	
		DNA				Models	
	Replication of	Summarzie the process of	Griffith				
	DNA	DNA replication					
			Hershey and Chase				
			Meselson and Stahl				
			bacteriophage				
			Chargaff				
			Watson and Crick				
			Antiparallel				
			Double helix				
			Helicase				
			Polymerase				
			Ligase				
			Okazaki				
			Topoisomerase				
			Semi-conservative				
			Replication fork				
			Origin of replication				
			SSBsPrimer				
			Primase				
			Leading strand				
			Lagging strand				
			Telomeres				
			Telomerase				

J Cell Communication and

Reproduction

a								
	Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
n	How do cells	Mitosis - stages	Explain various pathways of	cell cycle	Teacher Summative -		Lab 3 - Mitosis	3.2.12.C-Apply the elements of scientific
	communicate, grow and		cell communication.		Mitosis and Meiosis Lab		and Meiosis	inquiry to solve multi-step problems.
	reproduce?							
u				genome	Common Summative -		Henrietta Lacks	3.3.12.A-Explain the relationship
					Test		and the Immortal	between structure and function at all
							Cells	levels of organization.
а		Regulation of the		chromsomes				
		cell cycle						
r			Identify different cell	chromatin	Teacher Summative -			
			receptors.		Draw and Label the			
					different phases			
у				gametes				

Meiosis - stages	Explain the reasoning behind cell division.	somatic cells
	Summarize the various phases of the cell cyle.	sister chromatids
Sexual and Asexual	Compare cell division in both animal and plant cells.	kinetochores
Reproduction		centromere
	Explain the regulations of the cell cycle and explore problems related to lack of control (cancer).	centrosome
	Summarize the various phases of meiosis.	cytokinesis
	Compare - contrast asexual and sexual reproduction.	mitosis
	Perform a lab to compare and contrast mitosis and meiosis.	asexual
		sexual
		interphase
		M phase
		prophase
		anaphase
		telophase
		metophase
		G1
		S phase
		G2
		cleavage
		cell plaste
		crossing over
		chiasmata
		synapsis
		binary fission
		checkpoints
		Cyclin dependent kinase
		MPF
		cancer
		locus
		clone
		homologous
		chromosomes
		autosomes
		diploid
		haploid

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Molecular Genetics
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Essential Questions	Content	Knowledge and Skills	Vocabulary	Accessments	Lessons	Resources	Standards
How is genetic information inherited and expressed?	Protein Synthesis	Explain in great detail using key vocabulary terms the process of protein synthesis and the regulation of it.	transcription	Teacher Summative - Quiz	20330113	Molecular Kits	3.2.12.C-Apply the elements of scientific inquiry to solve multi-step problems.
In what ways can gene expression be controlled?	Mutations	Explain different types of mutations that may occur.	translation	Common Summative - test			3.3.12.B-Analyze the chemical and structural basis of living organisms.
			gene expression			Animations	3.3.12.C-Explain gene inheritance and expression at the molecular level.
	Eukaryotic Gene Control	Provide examples and explanations of various ways that gene expression occurs in eukaryotic cells.	RNA splicing				
		Relate cancer to problems associated with gene control.	mRNA			Online lectures	
			tRNA				
			rRNA				
			spliceosomes				
			introns				
			exons				
			miRNA				
			SIRNA				
			piwiRNA				
			anticodon				
			template strand				
			reading frame				
			triplet code				
			RNA polymerase				
			transcription unit				
			transcription factors				
			transcription initiation				
			unit				
			TATA box				
			promoter				
			poly-A-tall				
			ribozymes				
			wobble				
			signal pepide				
			signal recognition				
			particle				
			point mutation				
			silent mutation				

nonsense mutation missense mutation insertion deletion silent mutation mutagen histone acetylation DNA methylation epigenetic inheritance enhancers differentiation cytoplasmic determinants bicoid gene morphognesis induction determination pattern formation positional information homeotic genes maternal effect genes egg polarity genes oncogenes proto-oncogenes =tumor supressor genes

F Genetics

е								
	Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
b	Why is DNA called the	Mendilian	Define key genetic terms.	character	Homework - Genetic		Online lectures	3.2.12.C-Apply the elements of scientific
	"blueprint of life"?	Genetics			Problems			inquiry to solve multi-step problems.
r		Probability	Discuss the contributions	trait	Common Summative -			3.3.12.C-Explain gene inheritance and
			Mendel made to genetics.		test			expression at the molecular level.
u		Genetic Disorders	Explain the laws of segregation and	true breeding	Teacher Summative - quiz on genetic			
		A	independent assortment.		problems			
а		Gene Linkage	Interpret pedigrees.	hybridization				
r		Sex-Linked Genes		P, F1, F2 generation				
у		Nondisjunction	Solve various genetic problems using the laws of probability.	alleles				
		Chi Squared		dominant				
		Problems						
				recessive				
			Research and present various genetic disorders.	homozygous				

Create a gene map based on heterozygous recombination frequencies.

Understand the role sex- linkage plays in genetics.	law of segregation
Solve sex-linked genetic	law of independent
problems.	assortment
Participate in a lab	phenotype
simulation to experiment	
with sex-linked	
characteristics.	
	genotype
Explain what happens when	pedigree
nondisjunction occurs.	
Practice chi squared	incomplete dominance
problems	multiple alleles
	codominance
	pleiotropy
	epistasis
	polygenic inheritance
	chromosomal theory of
	inheritance
	wild type
	sex linked
	Barr body
	linked genes
	recombinant
	map units
	nonuisjunction
	monosomic
	trisomic
	duplication
	inversion
	deletion

translocation aneuploidy genomic imprinting chi square

Bacteria and Viruses

Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
What are the unique	Genetics of	Describe the structure of	virus	Teacher Summative -		Lab -	3.2.12.C-Apply the elements of scientific
characertiertics of	Viruses	viruses.		Quiz		transformation	inquiry to solve multi-step problems.
viruses and bacteria?							
What are ways that	Genetics of	Explain the lytic and	capsid	Teacher Summative -		Essays from old	3.3.12.C-Explain gene inheritance and
prokaryotic cells control	Bacteria	lysogenic reproductive		Transformation Lab		AP Exams	expression at the molecular level.
gene expression?		cycles of viruses.					
	Operon model	Describe how the HIV virus	reverse transcriptase	Common Summative -			
		reproduces.		test			
		State the role of viroids and	lytic				
		prions.					
		Explain the processes of	lysogenic				
		bacterial reproduction and					
		genetic recombination.					
		Compare and contrast the	phages				
		bacterial processes of					
		transformation,					
		transduction, conjugation,					
		and transposition.					
		Perform an experiment to	virulent phage				
		show the process of					
		transformation.					
		Summarize the role plasmids	s prophage				
		play in conjugation.					
		Diagram and explain how	provirus				
		the repressible and					
		inducible operons work.					
			operon				
			lac operon				
			trp operon				
			retrovirus				
			HIV				
			emergent viruses				
			viroid				
			prion				
			plasmid				
			conjugation				
			transformation				
			transduction				
			binary fission				
			F factor				

Μ	Biotechno	logy
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а								
	Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
r	How have new advances in DNA technology helped to improve society?	Cloning	List the steps to the cloning process.	DNA technology	Teacher Summative - Quiz		Lab - gel electrophoresis	3.2.12.C-Apply the elements of scientific inquiry to solve multi-step problems.
С	What is the relationship between genes and evolution?		List the steps and explain the importance of PCR.	biotechnology	Teacher Summative - Gel electrophoresis lab		Essays from old AP Exams	3.3.12.C-Explain gene inheritance and expression at the molecular level.
h		Polymerase Chain Reactions		nucleic acid hybridization	Common Summative - test			3.7.12.A-Apply advanced tools, materials and techniques to answer complex questions.
			Describe the process of gel electrophoresis and explain the importance of restriction enzymes to this technique.	genetic engineering				3.8.12.A-Synthesize and evaluate the interactions and constraints of science and technology on society.
				DNA sequencing				3.8.12.B-Apply the use of ingenuity and technological resources to solve specific societal needs and improve the quality of life.
		Gel Electrophoresis		cloning				3.8.12.C-Evaluate the consequences and impacts of scientific and technological solutions.
			Perform an experiment using gel electrophoresis.	restriction enzymes				
		Southern Blotting		restriction fragments				
		Explain the role southern blotting plays in biotechnology.	recombinant DNA					
	Gene Mapping DNA sequencing	Summarize the role gene mapping and DNA sequencing has played in the Human Genome Project.	cloning vector electrophoresis					
		Genomics	Discuss the importance of genomics.	ligase PCR electroporation RT-PCR				

Medical, Pharmaceutical, Forensic, Environmental and Agricultural Applications of DNA technology	Research the ways DNA has advanced various areas such as medicine, forensics and the environment.	SNP
		stem cell
		totipotent
Ethical Issues	Debate ethical questions raised by advances in biotechnology.	pluripotent
Totipotency in plants	Distinguish between cell differentiation in animals and plants.	nuclear transplantation
Nuclear	Explain the process of	induced pluripotent
Transplantation	nuclear transplanation and the results of the experiments performed.	stem cells
Problems with Cloning	Summarize the problems that are associated with cloning.	gene therapy
Pattern	Summarize how pattern	short tandem repeats
Formation in Animals and Plants	formation influences cell organization in both animals and plants.	
	Determine how changes in genetics has allowed for evolutionary change.	transgenic organisms
	Analyze data to determine	genetically modified
	the genetic relationship between organisms.	organisms
	-	gene annotation
		proteomics
		genomics
		metagenomics
		pseudogenes
		transposons
		repetitive DNA
		retrotransposons
		simple repeats
		homeobox

Mechanisms of

Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
How would you scientifically explain the mechanisms of evolution?	Darwinism	Explain Darwin's theory of evolution.	evolution	Teacher Summative - Labs - Hardy Weinberg and BLAST Labs		Labs	3.2.12.C-Apply the elements of scientific inquiry to solve multi-step problems.
	Evidence for Darwinism	Remark on other theories of evolution. (gradualism, catastrophism, and use and disuse)	descent with modification	Homework - Hardy- Weinberg Problems		Essays from old AP Exams	3.3.12.D-Explain the theory of evolution.
	Hardy - Weinberg Theorem		fitness	Teacher Summative - Quiz			
	Variation and Evolution	Summarize the evidence Darwin based his theory on.	speciation	Common Summative - Test			
	Modes of Selection for Variation		allopatric				
	Speciation Macroevolution	List the conditions of the Hardy-Weinberg Theorem.	sympatric bottleneck effect				
	Phylogeny and Systematics	Mathematically solve Hardy- Weinberg problems using the designed equation.	founder effect				
		Participate in a lab based off of the Hardy-Weinberg Theorem.	natural selection				
		Explain how genetic variations and natural selection have caused	adaptation homology				
		Describe the various modes of selection and provide examples for each.	analogy vestigial				
		Provide definitions for the term species.	convergent evolution divergent evolution endemic adaptive radiation				
		Explain the process of speciation.	Hardy-Weinberg microevolution				

Provide examples and explanations for macroevolution	macroevolution
Interpret various phylogenetic trees.	gene pool
Analyze the importance of the genome to evolution.	genetic drift
	selections
	reproductive isolation
	punctuated equilibrium
	endosymbiosis
	mass extinction
	phylogeny
	cladogram
	molecular clock
	domains
	gram positive
	gram negative

A Interactions - Plants and Hormones

р	Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
r	Essential Questions What are the advantages of multicellularity in plants? How do the systems of an organism allow for a successful organism?	Content Plant Hormones, Plant Structure and Growth, Transport	Knowledge and Skills Determine the function of hormones that play a key role in plants. List and explain the role that various stimuli have on plants. Describe the various types	auxin	Assessments Teacher Summative - Plant Hormone Advertising Agency Project	Lessons	Resources Essays from old AP Exams	Standards 3.3.12.A-Explain the relationship between structure and function at all levels of organization.
			of plant cells and their role. Label parts of a flower and identify its function. Summarize the development of angiosperms. Perform an experiment to					
		Homoostosis	determine what conditions enable a plant to thrive. Provide examples and explanations for both sexual and asexual reproduction in plants.	autokining	Common Summative			2.2.12.B. Analyza the chemical and
I		Form and Function	Analyze the role water potential plays in plant transport and summarize using key scientific terms.	cytokinins	Test			structural basis of living organisms.

I	mmune System	Compose an advertising jingle to show the effects that specific hormones have on plants	giberellins	Teacher Summative - Transpiration Lab	
I	Endocrine System	Explain how thermoregulation plays a role in homeostasis.	brassinosteroids	Common Summative - Immune System Project	
ſ	Development	Provide examples and explanations for positive and negative feedback mechanisms	ethylene	Teacher Summative - Plant Packet	3.3.12.C-Explain gene inheritance and expression at the molecular level.
r	Nervous System	Determine and provide a function of the main player in the nervous system.	negative feedback		3.3.12.D-Explain the theory of evolution.
		Compare and contrast cell mediated and humoral immunity.	positive feedback		
		Analyze data to determine how different hormones effect homeostasis.	thermoregulation		
		Summarize embryonic development and morphogenesis in various organisms.	homeostasis		
		Explain the developmental fate of cells while focusing on various experimental evidence.	endotherm		
		Label a neuron. Summarize in great detail the steps of an action potential.	ctotherm SMR		
		Label a brain and explain the function of the parts.	BMR		
		Explain in great detail how molecularly muscle contraction occurs.	hypothalmus		
			pathogen adaptive immuntiy phagocytes cell mediated immunity humoral immunity innate immunity mast cells histamine inflammatory response toll like recpetors		

I

neutrophils
macrophages
antibodies
B cells
T cells
plasma cells
effector cells
memory cells
antigen
heavy chain
light chain
MHC
anitgen presenting cells
active immunity
passive immunity
autoimmune
endocrine
hormones
neurons
CNS
PNS
neurotransmitters
axon
dendrites
synapse
synapic terminal
presynapti c
postsynpatic
depolarization
repolarization
hyperpolarization
refractory period
saltatory conduction
nodes of ranvier

Ecology

Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons Resources	Standards
How do the interactions between organisms and the environment determine their habitat selection?	Organisms and their environment					
What are the major characteristics of both terrestrial and aquatic biomes?	Biomes	Analyze how various biotic and abiotic factors determine organism dispersal.	sensitive period	Teacher Summative - Biome Presentation	Essays from old AP Biology Exams	3.2.12.B-Evaluate experimental information for appropriateness and adherence to relevant science processes.

How does behavior determine the organism's interaction with its environment?	Experiments behind behavioral ecology		imprinting	Teacher Summative - Quiz		3.2.12.C-Apply the elements of scientific inquiry to solve multi-step problems.
How does the change in population size affect the environment?			kinesis	Teacher Summative - Behavior Experiment	Lab - Animal Behavior	3.3.12.A-Explain the relationship between structure and function at all levels of organization.
	Demography	Compare and contrast the major characteristics of both aquatic and terrestrial biomes.	taxis	Common Summative - Ecology Test 1	Lab 12 - Energy Transfer	3.8.12.C-Evaluate the consequences and impacts of scientific and technological solutions.
What role do community relationships play in the ecosystem?		Research and analyze various behavior experiments to understand the interaction of organisms with their environment.	fixed action pattern		Movie - "Arms Race"	
	Logistic model		atruism	Common Summative - Ecology Test 2		
How is energy transferred through an ecosystem?		Design an experiment to test the behaviors of pillbugs.	biomes			
	Exponential model		logistic			
What are ways that biology can be conserved and ecology can be restored?		Understand the dispersion of various populations.	exponential			
	Symbiotic relationships		carrying capacity			
		Differentiate between logistic and exponential population growth.	dispesion			
	Dominant and keystone species		life tables			
		Compare various symbiotic relationships.	survivorship curves			
	Ecological succession		K selection			
		Determine organisms that are keystone and dominant in an ecosystem.	R selection			
	Trophic relationships		density independent			

	Explain the various stages of primary and secondary succession.	density independent
Energy tranfers		competition
.,	Interpret, demonstrate and summarize various trophic relationships in both terrestrial and aquatic	symbiosis
	ecosystems.	
Biogeochemical cycles		niche
	Understand and explain the 10% rule of energy transfer.	mimicry
Human		character
population and disruption		displacementfacilitation
	Explain the steps and importance of various cycles	invasive species
Biodiversity		biological magnification
	Debate the role humans have played in destruction of the ecosystem.	food webs
		trophic levels
	Understand the importance of biodiversity.	keystone species
		hete
	Evaluate how human	
	pollution has affected	
	aquatic ecosystems by	
	performing an experiment.	

Review for Exam

Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons Resources	Standards
What can I study to be	Review the major	Review and evaluate		Summative - old AP Bio		3.2.12.C-Apply the elements of scientific
successful on the AP	ideas.	knowledge of material		exams		inquiry to solve multi-step problems.
Biology Exam?		studied over the course of				
		the year to prepare for the				
		AP Biology exam.				
						3.3.12.A-Explain the relationship
						between structure and function at all
						levels of organization.
						3 3 12 D-Evolain the theory of

3.3.12.D-Explain the theory of evolution.

After the AP Exam - Bug Lab and Cat Dissection

Essential Questions	Content	Knowledge and Skills	Vocabulary	Assessments	Lessons	Resources	Standards
What should be taught	Chose a topic to	Reseach and prep for the		Summative - Bug Lab		Review games	3.3.12.A-Explain the relationship
to the second graders	research and	second grade bug lab. Be		Project with Second			between structure and function at all
for bug lab? How can	prepare a lesson	able to identify various		Graders from the			levels of organization.
the anaytomy and	plan for the	organs and structure in the		District. Summative -			
physiology of the cat	second grade bug	cat. Relate structures found		Cat Lab Dissection			
compare to human	lab. Dissect and	to structures found in the				Stations	3.3.12.B-Analyze the chemical and
anatmoy and	locate various	human. Compare and					structural basis of living organisms.
physiology?	systems within	contrast the structure and				Barrons	3.3.12.C-Explain gene inheritance and
	the cat.	function of these organs to					expression at the molecular level.
		the human.					3.3.12.D-Explain the theory of
							evolution.

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