Science Curriculum Map

Applied Biology From Molecules to Organisms

Standard: LS1 From Molecules to Organisms	***Performance Expecation:*** Develop and use a model to illustrate hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
Essential Question: What is Biology? What are cells made up of and how do they function? What is photosynthesis and how does it work? What is respiration and how does it work? How do cells divide and why?	***Science and Engineering Practices:*** Developing and Using Models Planning and Carrying Out Investigations Constructing Explanations and Designing Solutions
Disciplinary Core Idea: Structure and Function Growth and Development of Organisms Organization for Matter and Energy Flow in Organisms	***Crosscutting Concepts***: Systems and Systems Models Structure and Function
Resources: See Quivers	***Assessments:*** Foldable Human, Fish Observation, On-line lab, Lab Reports, Vernier Labs, Online Activities, Video summaries, Text summaries, Case Studies, Chapter Test, Unit Test
Vocabulary: Scientific Method Observations Hypothesis Dependent Variable Independent Variable Control Theories Laws Prokaryote Eukaryote DNA Nucleus Ribosomes Cytoplasm Chromosomes Organelles Mitochondria Endoplasmic Reticulum Haploid Diploid	 Golgi Apparatus Cell Cycle Interphase Prophase Anaphase Metaphase Telophase Meiosis Mitosis Cancer Diversity Semipermeable Cell Membrane Active Transport Passive Transport Diffusion Osmosis Homeostasis Crossing-Over

Binary Fission Autotroph Heterotroph Glucose Chlorophyll Endosymbiosis Electron Transport Chain Calvin Cycle Stomata	Gametes Fertilization Photosynthesis Food Web ATP Chloroplast Thylakoid Light Reactions Dark Reactions Chemosynthesis

Unit One- From Molecules To Organisms Checklist

Day 1

Intro and Syllabus

Start Foldable Human System Project

Day 2

Foldable Human System Project _____

Day 3

Intro to Biology Video _____

Scientific Method Video _____

Day 4

Fish Observation Lab _____

Ch 1 Outline and Practice _____

Day 5

Virtual Fish _____

Ch 2 Outline and Practice _____

Day 6

Essential Characteristics of Life Video _____

Hierarchy of Life Video _____

Day 7

Start Origins of Life Case Study

Day 8

Finish Origins of Life CS _____

Study for Quiz

Day 9

Quiz Section 1 _____

Unit 1 From Molecules to Organisms Section 2 Checklist

Day 1

Quiz Section 1 _____

Start Cell Model Tour

Day 2

Finish Cell Model Tour ____

Cell Theory Video _____

Day 3

A Tour of the Cell Video _____

Transport Across the Cell Membrane Video _____

Day 4

Ch 13 Flexbook _____

Ch 14 Flexbook _____

Ch 15 Flexbook _____

Day 5

Osmosis Video _____

Why Cells are so Small Video _____

Day 6

Vernier Osmosis Lab _____

Ch 16 Flexbook _____

Day 7

Transport Strike Case Study _____

Ch 21 Flexbook _____

Day 8

Vernier Cell Size Lab _____

Study for Quiz

Day 9

Quiz Section 2 _____

Unit 1 From Molecules to Organisms Section 3 Photosynthesis

Day 1

Section 2 Quiz_____

Photosynthesis Sim (STEM) _____

Day 2

Gibbs Free Energy Video _____

ATP Video _____

Day 3

TED Photosynthesis Video _____

Calvin Cycle Sim _____

Ch 45 _____

Day 4

Photosynthesis and Respiration Video _____

Life Without Oxygen _____

Ch 46 _____

Ch 47 _____

Day 5

Photosynthesis Lab _____

Ch 48 _____

Day 6

Ch 49 _____

Ch 50 _____

Review for Quiz

Day 7

Section 3 Quiz _____

Unit 1 From Molecules to Organisms Section 4 Respiration

Day 1

Quiz Section 3 _____

Start Follow That Carbon!

Day 2

Finish Follow That Carbon! _____

Ch 52 _____

Day 3

Cellular Respiration Video _____

Anaerobic Respiration Video _____

Ch 53 _____

Day 4

Ch 54 _____

Ch 56 _____

Day 5

Mystery of the Seven Deaths _____

Ch 59 _____

Study for Quiz

Day 6

Quiz Section 4 _____

Quivers

Question What is Biology?

Investigation Foldable Human System Project

Video Biology, Scientific Method, Essential Characteristics of Life, Hierarchy of Life, Three Domains

Elaborate Fish Observation, Virtual Fish, Origins of Life CS, Ch 1 and 2

Review

Summary Quiz

Quivers

Question	What are cells made up of and how does it function?
Investigation	Cell Model and Tour
Video	Cell Theory, A tour of a Cell, Transport Across the Cell Membranes, Osmosis, Why cells are so small
Elaborate	Ch 13, 14, 15, 16, 21, Transport Strike CS Vernier Osmosis, Vernier Cell Size Lab
Review	

Quivers

Question What is photosynthesis and how does it work?

Investigation Photosynthesis Sim (STEM)

Video Gibbs Free Energy, ATP, TED Photo, Photo and Resp

Elaborate Resp and Photo Webquest, Calvin Cycle Sim, Life without Oxygen, Photosynthesis Lab, Ch 45,46, 47, 48, 49

Review

Quivers

Question	What is cellular respiration and how does it work?
Investigation	Moveable model of Photo and Resp. (Follow that Carbon!)
Video	Cellular Respiration, Anaerobic Respiration
Elaborate	Ch 52, 53, 54, 56, 59, Mystery of the 7 Deaths
Review	

Science Curriculum Map

AB Heredity

Standard: Heredity: Inheritance and Variation of Traits	***Performance Expectation:*** LS3-1 Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parent to offspring. LS3-2 Make and defend a claim based on evidence that inheritable genetic variations may result from new genetic combinations through meiosis, viable errors occurring during replication, and / or mutations caused by the environment. LS 3-3 Apply concept of statistics and probability to explain the variation and distribution of expressed traits in a population
Essential Question: How does DNA determine characteristics? How are traits passed from one generation to the next?	***Science and Engineering Practices:*** Analyzing and Interpreting Data
Disciplinary Core Idea: Structure and Function Inheritance of Traits Variation of Traits	***Crosscutting Concepts***: Cause and Effect Scale Proportion, and Quantity
Resources: See Quivers and Checklist	***Assessments:*** Inquiry Lab, Case Study, Videos, Outlines and Reviews, Quiz, Unit Test, projects, Punnett square work
Vocabulary: Chromosome Histone Autosome Sex Chromosome Genes Linkage Crossing Over Sex Linked Genetics Homozygous Heterozygous Dominant	 Recessive Self-pollination Cross-pollination F1 F2 P1 Law of Segregation Law of Independent Assortment Heredity Alleles Genotype Phenotype

Applied Biology Heredity II Checklist

Day 1

DNA and RNA Quiz _____

Start Genetics Inquiry Project _____

Ch 4 O and R _____

Day 2

Genetics Video _____

Pedigree Activity _____

Ch 5 O and R _____

Day 3

Mendel Video _____

Ch 6 Outline and Review _____

Blue People Case Study _____

Day 4

Punnett Square Video _____

Ch 7 Outline and Review _____

Ch 8 Outline and Review _____

Work on Inquiry Project

Day 5

Sponge Bob Genetics _____

Ch 9 Outline and Review _____

Work on Inquiry Project

Day 6

Advanced Genetics _____

Ch 10 Outline and Review _____

Review for Quiz/ Finish all work

Day 7

Baby Face Genetics _____

Day 8

Heredity II Quiz

Genetics Inquiry Project Due _____

Quivers

Heredity

Question	How does DNA determine our characteristics?
Investigation	DNA Extraction Inquiry Lab
Video	DNA and RNA I and II, DNA Replication , Transcription and Translation
Elaborate	Grandma Gene's Journal, Sickle Cell Project
Review	
Question	How are traits passed from one generation to the next?
Investigation	Genetics Inquiry Project,
Video	Mendel, Punnett square, Advanced Genetics
Elaborate	Geniverse, Baby Face Genetics, SpongeBob Genetics, Blue People CS, Pedigree Activity
Review	

Science Curriculum Map

AB Evolution

Standard: Heredity: Inheritance and Variation of Traits	***Performance Expectation:*** HS-LS4-1Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. HS-LS4-2Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment. HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations. HSLS4-5 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.
Essential Question: How are living organisms classified? What is evolution and what is the evidence for it? How does natural selection drive evolution?	***Science and Engineering Practices:*** Analyzing and Interpreting Data Using mathematics and computational thinking. Constructing explanations and designing solutions. Engaging in argument for evidence.
Disciplinary Core Idea: Evidence of common ancestry and diversity. Natural selection. Adaptation. Biodiversity and humans. Developing possible solutions.	***Crosscutting Concepts***: Cause and Effect Patterns

Resources: See Quivers and Checklist	***Assessments:*** Lab, Case Study, Videos, Outlines and Reviews, Quiz, Unit Test, Worksheets, Webquest, Simulations
Vocabulary: Taxonomy Classification Taxa Species Genus Kingdom Phylum Class Order Family Binomial nomenclature Domain Phylogeny Cladistics Natural selection Artificial selection Adaptations Fossil Palaeontologist Comparative anatomy Homologous structure Analogous structure Embryology Vestigial structures Biogeography Mutation Gene flow Genetic drift Macroevolution Species Allopatric Sympatric	

Evolution Checklist

Day 1

Strange Fish

7 Skeletons and a Feather _____

Day 2

Taxonomy Video _____

Ch 1 O and R _____

Ch 2 O and R _____

Day 3

6 Kingdoms Lab _____

Shape Island _____

Day 4

Antipodal Mystery _____

Day 5

Alien Classification _____

Study for Quiz

Day 6

Quiz One _____

Start Evolution Webquest

Day 7

Evolution Webquest _____

Ch 3 O and R _____

Day 8

Theories of Origins of Life and Evolution Video _____

5 Fingers of Evolution _____

Ch 4 O and R _____

Day 9

Darwin Video _____

Understanding Evolution _____

Ch 5 O and R _____

Ch 6 O and R _____

Day 10

Evidence for Evolution Video _____

Evidence video II _____

Ch 7 O and R_____

Ch 8 O and R _____

Day 11

Ch 11 O and R _____

Study for Quiz 2

Day 12

Quiz 2 _____

Skin Pigment CS _____

Day

Ch 12 O and R _____

Ch 13 O and R_____

Natural Selection Video _____

Evolution of Skin Color _____

Day 14

Examples of Natural Selection Video _____

Peppered Moth Simulation _____

Study for Test

Day 15

Evolution Unit Test

Quivers

Question	What is evolution and what is the evidence for it?
Investigation	Evolution Webquest
Video	Theories of Origins of life and evolution, 5 fingers of evolution, evidence for evolution I, evidence for evolutioin II evolution Darwin
Elaborate	Ch 3, 4, 5, 6, 7, 8, 11 Lamarck, Understanding Evolution
Question	How does natural selection drive evolution?
Investigation	Skin Pigment CS
Video	Natural Selection, Examples of Natural Selection
Elaborate	Evoulution of Skin Color, I thought this happened gradually, Ch 12,13 Peppered Moth Simulation (Video Lab)