

UNIT OF STUDY

Title: Cycles of Life	Subject/Course: Biology	Length: 9 weeks
Topic: Heredity and Evolution	Grade: 9-12	Designer: LouAnn Howell
UNIT GOALS AND EXPECTATIONS		
<p>IMPORTANT CONCEPTS/UNDERSTANDINGS: Reproduction is a vital function of all living organisms in order to propagate each species.</p> <p>The characteristics of organisms are passed from one generation to the next through genes which are contained in the nucleus of the reproductive cells.</p> <p>Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.</p> <p>Fossils indicate that many organisms that lived long ago are extinct.</p> <p>Extinction of species is common; most of the species that have lived on the earth no longer exist.</p>	<p>ESSENTIAL QUESTIONS: What were the outcomes of Gregor Mendel's experimental procedures?</p> <p>How can we use the laws of probability and Punnett squares to predict genotypic and phenotypic ratios?</p> <p>What is the historical significance of selected prominent geneticists.</p> <p>What is the structure and function of DNA and RNA ?</p> <p>What is the process of replication, transcription and translation?</p> <p>What are the effects of changes brought about by mutations both beneficial, harmful and neutral.</p> <p>What is Lamarck's explanation of evolution as compared to Darwin's theory of evolution by natural selection?</p> <p>What are the effects of mutations, beneficial, harmful, and neutral and the resulting variations within a population?</p> <p>When have periods of mass extinction taken place?</p> <p>What evidence of evolution is found in fossil records, DNA analysis, artificial selection, morphology, embryology, viral evolution, geographic distribution of related species, antibiotic and pesticide resistance in various organisms?</p> <p>What are the characteristics of the organisms in the six kingdoms?</p>	
<p>STUDENT LEARNING EXPECTATIONS: HE.4B.1 Summarize the outcomes of Gregor Mendel's experimental procedures. HE.4.B.3 Use the laws of probability and Punnett squares to predict genotypic and phenotypic ratios. HE.4.B.5 Analyze the historically significant work of prominent geneticists. HE.5.B.3 Compare and contrast the structure and function of DNA and RNA. HE.5.B.4 Describe and model the process of replication, transcription, and translation. HE.5.B.6 Identify effects of changes brought about by mutations: beneficial, harmful, neutral. HE.6.B.1 Compare and contrast Lamarck's explanation of evolution with Darwin's theory of evolution by natural selection. HE.6.B.3 Analyze the effects of mutations and the resulting variations within a population in terms of natural selection. HE.6.B.4 Illustrate mass extinction events using a time line. HE.6.B.5 Evaluate evolution in terms of evidence as found in the following: fossil record, DNA analysis, artificial selection, morphology, embryology, viral evolution, geographic distribution of related species, antibiotic and pesticide resistance in various organisms. CDL.7.B.2 Differentiate the characteristics of the six kingdoms: Ecbacteria, Archaea, Protisita, Fungi, Plantae, Animalia</p>		
<p>SPECIFIC DECLARATIVE KNOWLEDGE – What I know Understand Gregor Mendel is known as "the Father of Genetics" because of his work with pea plants. Determine punnett squares are used to determine the probabilities of certain inherited traits. Understand a genotype is the term for alleles.</p>	<p>SPECIFIC PROCEDURAL KNOWLEDGE – What I need to do Predict appearance of organisms based on inherited genes. Recognize the differences in DNA and RNA models. Model replication of DNA. Depict mass extinction events. Categorize organisms based on the characteristics of their kingdoms.</p>	

<p>Know a phenotype is the physical characteristics determined by the genotype.</p> <p>Explain that Watson and Crick are credited to discovering the structure of DNA.</p> <p>Understand that DNA is made up of 2 sugar, a phosphate and a nucleic acid.</p> <p>Understand that RNA is made up of 1 sugar, a phosphate and a nucleic acid.</p> <p>Determine that each DNA molecule has alleles which determine a person's genetic make up.</p> <p>Understand that the process of replication, transcription and translation makes the proteins necessary for our body to function.</p> <p>Identify the fact that Lamarch and Darwin had different theories about how organisms came into being.</p> <p>Know that DNA replication results in some mutations of the genetic code. Not all mutations are harmful. Some are beneficial and are necessary for diversity among species.</p> <p>Understand that mass extinctions of organisms have occurred in the past due to natural catastrophes, diseases, and other causes.</p> <p>Understand that the theory of evolution claims that evidence of changes in organisms can be found in fossil remains, rock strata, and similarities on DNA among organisms.</p> <p>Understand that organisms on Earth, both prokaryotic and eukaryotic are divided into six kingdoms which are further subdivided for easier identification.</p> <p>Identify specific evidences of evolution</p> <p>Identify the effects of changes in DNA.</p> <p>Describe the changes in organisms that take place over time.</p> <p>Identify the changes that occur in organisms for survival.</p> <p>Identify major genetic discoveries.</p> <p>Recognize the difference in dominant and recessive traits.</p>	
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UNIT ASSESSMENTS (Include tasks related to Dimensions 3 and 4 and Bloom's Taxonomy)
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<p>Use a Punnett square to answer a genetic problem .</p> <p>Models of DNA with identifying labels.</p> <p>Dramatization of replication, transcription and translation.</p>

<p>Traditional Assessments:</p> <p>Quizzes</p>	<p>Other Evidence of Learning:</p> <p>Notebook entries</p> <p>Observations of Labs</p> <p>Timeline of mass extinctions</p>
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ACTIVITIES AND LEARNING EXPERIENCES	Resources
Complete Bikimi Bottom genetics activities.	www.sciencespot.net
Identify the traits of plants and animals given real examples or photographs (for example height, hair color, eye color, flower color).	Genetics, Unitedstreaming
Complete genetics with a smile activity	www.sciencspot.net
Match geneticists to major discoveries	Genetics, Unitedstreaming
Depict or illustrate the appearances of DNA and RNA models by labeling a model.	Genetics, Unitedstreaming
Students will model replication of DNA by matching like items (i.e. matching socks, sorting clothes by color)	Genetics, Unitedstreaming

<p>Students will identify different kingdoms by matching pictures of organisms according to characteristics... Specifically animals, plants, vertebrates, and invertebrates.</p> <p>Extract DNA from bananas or strawberries</p> <p>Act out how mutations occur.</p>	<p>AGFC</p> <p>SAMSC lab book</p> <p>SAMSC lab book</p>
Career Connections	
<p>Lab Tech</p> <p>Paleontologist Tech</p> <p>X-ray Tech</p>	