

<b>Planned Course: Honors Biology</b>	<b>Course Number: S401H</b>	<b>Department: Science</b>	
<b>Unit: Genetics and Evolution</b>	<b>Grade Level: 9-10</b>		
<b>Estimated Time: 45 days</b>	<b>Level/Track: College Prep</b>	<b>Date Approved: 08/22/2016</b>	
<b>Biology Keystone Eligible Content</b> ▶ PA Academic Standards	▶ <b>Core Concepts (in question format)</b> • Skills/Knowledge	<b>Activities/Strategies/Study Skills</b> (identify some activities as remedial or enrichment activities)	<b>Assessments</b> (include types and topics)

<ul style="list-style-type: none"> <li>❖ Bio.B.3.3.1 <ul style="list-style-type: none"> <li>• 3.1.B.A9</li> </ul> </li> <li>❖ Bio.B.1.2.1 <ul style="list-style-type: none"> <li>• 3.1.B.B1</li> <li>• 3.1.B.B3</li> <li>• 3.1.B.B5</li> <li>• 3.1.B.C2</li> </ul> </li> <li>Bio.B.1.2.2 <ul style="list-style-type: none"> <li>• 3.1.B.B1</li> <li>• 3.1.B.B5</li> <li>• 3.1.B.B2</li> <li>• 3.1.B.B3</li> <li>• 3.1.C.C2</li> </ul> </li> <li>❖ Bio.B.2.2.1 <ul style="list-style-type: none"> <li>• 3.1.B.B1</li> <li>• 3.1.B.B3</li> <li>• 3.1.B.B5</li> <li>• 3.1.C.B3</li> <li>• 3.1.C.C2</li> </ul> </li> <li>❖ Bio.B.2.2.2 <ul style="list-style-type: none"> <li>• 3.1.B.A5</li> <li>• 3.1.B.B3</li> <li>• 3.1.B.B5</li> <li>• 3.1.C.B3</li> </ul> </li> <li>❖ Bio.B.2.3.1 <ul style="list-style-type: none"> <li>• 3.1.B.B1</li> <li>• 3.1.B.B3</li> <li>• 3.1.B.C2</li> <li>• 3.1.C.B3</li> <li>• 3.1.C.C2</li> </ul> </li> <li>❖ Bio.B.2.1.1</li> </ul>	<p>▶ What role does DNA play in the production of proteins necessary for growth and function of cells?</p> <p>DNA:</p> <ul style="list-style-type: none"> <li>• Identify the chemical components of DNA.</li> <li>• Discuss the experiments leading to the identification of DNA as the molecule that carries the genetic code.</li> <li>• Describe the steps leading to the development of the double-helix model of DNA.</li> <li>• Summarize the events of the DNA replication.</li> <li>• Compare DNA replication in prokaryotes with that of eukaryotes.</li> </ul> <p>RNA:</p> <ul style="list-style-type: none"> <li>• Contrast RNA and DNA.</li> <li>• Explain the process of transcription.</li> <li>• Identify the genetic code and explain how it is read.</li> <li>• Summarize the process of translation.</li> <li>• Describe the “central dogma” of molecular biology.</li> <li>• Define mutations and describe the different types of mutations.</li> </ul>	<p>▶ Suggested Labs and Activities:</p> <ul style="list-style-type: none"> <li>• KNEX DNA Structure Lab</li> <li>• KNEX DNA Replication Lab</li> <li>• KNEX Transcription / Translation Lab</li> <li>• Protein Synthesis Scavenger Hunt</li> <li>• RNA and Protein Synthesis Gizmo</li> <li>• Constructing a Human Pedigree Lab</li> <li>• Constructing a Human Karyotype Lab (Identifying Genetic Disorders)</li> <li>• Human Karyotyping Gizmo</li> <li>• Modeling Restriction Enzymes</li> <li>• Click and Clone Mouse Genetics</li> <li>• DNA Fingerprinting Simulation</li> <li>• DNA Fingerprinting Gizmo</li> <li>• Amino Acid Sequences Lab</li> <li>• Comparing Bones Activity</li> <li>• Natural Selection Gizmo</li> <li>• Microevolution Gizmo</li> <li>• Ecosystems and Speciation Lab</li> </ul> <p>▶ Scientific Article Assignments</p> <p>▶ Homework / Classwork to reinforce major concepts</p> <p>▶ Data Analysis</p> <p>▶ Visual Quizzes</p> <p>▶ Graphic Organizers / Diagrams</p>	<ul style="list-style-type: none"> <li>▶ Formative Assessments</li> <li>▶ Quizzes</li> <li>▶ Honors level chapter/topic summative assessments</li> <li>▶ Honors level lab Reports/Assessments</li> <li>▶ Quarterly Assessment #3</li> </ul>
---	--	--	---

<b>Planned Course: Honors Biology</b>	<b>Course Number: S401H</b>	<b>Department: Science</b>	
<b>Unit: Genetics and Evolution</b>	<b>Grade Level: 9-10</b>		
<b>Estimated Time: 45 days</b>	<b>Level/Track: College Prep</b>	<b>Date Approved: 08/22/2016</b>	
<b>Biology Keystone Eligible Content</b> ▶ PA Academic Standards	<b>Core Concepts (in question format)</b> • Skills/Knowledge	<b>Activities/Strategies/Study Skills</b> (identify some activities as remedial or enrichment activities)	<b>Assessments</b> (include types and topics)

<ul style="list-style-type: none"> <li>• 3.1.B.B5</li> <li>❖ Bio.B.2.1.2 <ul style="list-style-type: none"> <li>• 3.1.B.B1</li> <li>• 3.1.B.B2</li> <li>• 3.1.B.B3</li> <li>• 3.1.C.C2</li> </ul> </li> <li>❖ Bio.B.2.4.1 <ul style="list-style-type: none"> <li>• 3.1.B.B4</li> <li>• 4.4.7.A</li> <li>• 4.4.10.A</li> <li>• 4.4.12.A</li> <li>• 4.4.7.B</li> <li>• 4.4.10.B</li> <li>• 4.4.12.B</li> </ul> </li> <li>❖ Bio.B.3.2.1 <ul style="list-style-type: none"> <li>• 3.1.B.C3</li> <li>• 3.1.B.C1</li> <li>• 3.1.B.B3</li> </ul> </li> <li>❖ Bio.B.3.1.1 <ul style="list-style-type: none"> <li>• 3.1.B.C1</li> </ul> </li> <li>❖ Bio.B.3.1.2 <ul style="list-style-type: none"> <li>• 3.1.B.C1</li> <li>• 3.1.B.C2</li> </ul> </li> <li>❖ Bio.B.3.1.3 <ul style="list-style-type: none"> <li>• 3.1.B.C2</li> <li>• 3.1.B.B1</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Describe the effects mutations can have on genes.</li> <li>▶ How is hereditary information in genes inherited and expressed? Human Heredity <ul style="list-style-type: none"> <li>• Identify the types of human chromosomes in a karyotype.</li> <li>• Describe the patterns of the inheritance of human traits.</li> <li>• Explain how pedigrees are used to study human traits.</li> <li>• Explain how small changes in DNA cause genetic disorders.</li> <li>• Summarize the problems caused by nondisjunction.</li> </ul> </li> <li>Genetic Engineering <ul style="list-style-type: none"> <li>• Explain the purpose of selective breeding.</li> <li>• Explain how people increase genetic variation.</li> <li>• Explain how scientists manipulative DNA.</li> <li>• Describe the importance of recombinant DNA.</li> <li>• Define transgenic and describe the usefulness of some transgenic organisms to humans.</li> <li>• Describe the benefits of genetic engineering as they relate to agriculture and</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▶ Study Guides</li> <li>▶ Inquiry-based lab activities</li> <li>▶ Extension and enrichment activities and labs</li> </ul>	
--	--	--	--

<b>Planned Course: Honors Biology</b>	<b>Course Number: S401H</b>	<b>Department: Science</b>	
<b>Unit: Genetics and Evolution</b>	<b>Grade Level: 9-10</b>		
<b>Estimated Time: 45 days</b>	<b>Level/Track: College Prep</b>	<b>Date Approved: 08/22/2016</b>	
<b>Biology Keystone Eligible Content</b> ▶ PA Academic Standards	<b>▶ Core Concepts (in question format)</b> • Skills/Knowledge	<b>Activities/Strategies/Study Skills</b> (identify some activities as remedial or enrichment activities)	<b>Assessments</b> (include types and topics)

	<p>industry.</p> <ul style="list-style-type: none"> <li>• Explain how recombinant DNA technology can improve human health.</li> <li>• Summarize the process of DNA fingerprinting and explain its uses.</li> </ul> <p>▶ How does evolution result from the random processes selecting for survival and reproduction of a population?</p> <p>Darwin's Theory of Evolution</p> <ul style="list-style-type: none"> <li>• Describe the conditions under which natural selection occurs.</li> <li>• Explain the principle of common descent.</li> <li>• Explain how geologic distribution of species relates to their evolutionary history.</li> <li>• Explain how fossils and the fossil record document the descent of modern species from ancient ancestors.</li> <li>• Describe what homologous structures and embryology suggest about the process of evolutionary change.</li> <li>• Explain how molecular evidence can be used to trace the process of evolution.</li> </ul>		
--	--	--	--

<b>Planned Course: Honors Biology</b>	<b>Course Number: S401H</b>	<b>Department: Science</b>	
<b>Unit: Genetics and Evolution</b>	<b>Grade Level: 9-10</b>		
<b>Estimated Time: 45 days</b>	<b>Level/Track: College Prep</b>	<b>Date Approved: 08/22/2016</b>	
<b>Biology Keystone Eligible Content</b> ▶ PA Academic Standards	<b>▶ Core Concepts (in question format)</b> • Skills/Knowledge	<b>Activities/Strategies/Study Skills</b> (identify some activities as remedial or enrichment activities)	<b>Assessments</b> (include types and topics)

	<ul style="list-style-type: none"> <li>• Explain the results of the Grants' investigation of adaptation in Galapagos finches.</li> </ul> <p>▶ Evolution of Populations</p> <ul style="list-style-type: none"> <li>• Define evolution in genetic terms.</li> <li>• Identify the main sources of genetic variation in a population.</li> <li>• State what determines the number of phenotypes for a trait.</li> <li>• Explain how natural selection affects single-gene and polygenic traits.</li> <li>• Describe genetic drift.</li> <li>• Explain how different factors affect genetic equilibrium.</li> <li>• Identify the types of isolation that can lead to the formation of new species.</li> <li>• Describe the current hypothesis about Galapagos finch speciation.</li> </ul>		
--	---	--	--