

HudsonAlpha High School Field Trip Experiences Alignment with 2015 Alabama Course of Study

	Cytogeneticist for a Day	Extreme Extraction	All in the Family – Or Is It?	GenomeCache®	Investigating the Genetics of Cancer	Genetically Modified Snacks?	Genes & ConSEQUENCES®	Jumping Genes	Sequencing and Beyond
<b>Scientific and Engineering Practices</b>									
Asking questions (for science) and defining problems (for engineering)		☉	☉		☉	☉		☉	
Developing and using models	☉			☉	☉		☉		☉
Planning and carrying out investigations		☉				☉		☉	
Analyzing and interpreting data	☉	☉	☉		☉	☉	☉	☉	☉
Constructing explanations (for science) and designing solutions (for engineering)		☉					☉		
Engaging in argument from evidence	☉	☉	☉		☉	☉			☉
Obtaining, evaluating, and communicating information	☉	☉	☉	☉	☉	☉	☉	☉	☉
<b>Crosscutting Concepts</b>									
Patterns	☉								☉
Cause and Effect	☉	☉	☉		☉	☉	☉	☉	☉
Scale, proportion, and quantity				☉					
Systems and system models									
Structure and function		☉						☉	
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<b>Biology Standards</b>									
1. Use models to compare and contrast how the structural characteristics of carbohydrates, nucleic acids, proteins, and lipids define their function in organisms.		☉					☉		

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<p>2. Obtain, evaluate, and communicate information to describe the function and diversity of organelles and structures in various types of cells (e.g., muscle cells having a large amount of mitochondria, plasmids in bacteria, chloroplasts in plant cells).</p>		<p>⊙</p>							
<p>3. Formulate an evidence-based explanation regarding how the composition of deoxyribonucleic acid (DNA) determines the structural organization of proteins.</p>			<p>⊙</p>		<p>⊙</p>		<p>⊙</p>		
<p>3. A. Obtain and evaluate experiments of major scientists and communicate their contributions to the development of the structure of DNA and to the development of the central dogma of molecular biology.</p>									
<p>3.B. Obtain, evaluate, and communicate information that explains how advancements in genetic technology (e.g., Human Genome Project, Encyclopedia of DNA Elements [ENCODE] project, 1000 Genomes Project) have contributed to the understanding as to how a genetic change at the DNA level may affect proteins, and in turn, influence the appearance of traits.</p>	<p>⊙</p>	<p>⊙</p>	<p>⊙</p>	<p>⊙</p>		<p>⊙</p>	<p>⊙</p>	<p>⊙</p>	<p>⊙</p>
<p>4. Develop and use models to explain the role of the cell cycle during growth and maintenance in multicellular organisms (e.g., normal growth and/or uncontrolled growth resulting in tumors).</p>			<p>⊙</p>		<p>⊙</p>				
<p>11. Analyze and interpret data collected from probability calculations to explain the variation of expressed traits within a population. C. Analyze and interpret data (e.g., pedigree charts, family and population studies) regarding Mendelian and complex genetic disorders (e.g., sickle-cell anemia, cystic fibrosis, type 2 diabetes) to determine patterns of genetic inheritance and disease risks from both genetic and environmental factors.</p>			<p>⊙</p>		<p>⊙</p>		<p>⊙</p>	<p>⊙</p>	<p>⊙</p>
<p>12. Develop and use a model to analyze the structure of chromosomes and how new genetic combinations occur through the process of meiosis. A. Analyze data to draw conclusions about genetic disorders caused by errors in meiosis (e.g., Down syndrome, Turner syndrome).</p>	<p>⊙</p>								<p>⊙</p>
<p><b>Environmental Science Standards</b></p>									

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<b>6. Obtain, evaluate, and communicate information to describe how human activity may affect biodiversity and genetic variation of organisms, including threatened and endangered species.</b>						●			
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