

Phoenixville Area School District Understanding by Design (UbD) Science Unit Plan

Grade Level &/or HS Subject: **BIOLOGY**

Unit Name: **THE CENTRAL DOGMA**

Stage 1 Desired Results		
Overarching NGSS & PA Standards: HS-LS1-1 Which branch(es) of science apply: LS	Transfer	
	<i>Students will be able to independently use their learning to...</i> <ul style="list-style-type: none"> • Develop and/or use models • Construct explanations and design solutions 	
	Meaning-Making	
	<i>Students will understand that...</i> <ul style="list-style-type: none"> • The structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells. 	ESSENTIAL QUESTIONS <i>Students will keep considering...</i> <ul style="list-style-type: none"> • How do the structures of organisms enable life's functions?
	Knowledge and Skills Acquisition	
	<p style="text-align: center;">UNDERSTANDINGS</p> <i>Students will know...</i> <ul style="list-style-type: none"> • Systems of specialized cells within organisms help them perform the essential functions of life. • All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. • How the process of DNA replication results in the transmission and/or conservation of genetic information.* • How the processes of transcription and translation are similar in all organisms.* • The role of ribosomes, endoplasmic reticulum, Golgi apparatus, and the nucleus in the production of specific types of proteins.* • How genetic mutations alter the DNA sequence and may or may not affect phenotype (e.g., silent, nonsense, frameshift).* • the role of an enzyme as a catalyst in regulating a specific biochemical reaction.* • how factors such as pH, temperature, and concentration levels can affect enzyme function.* 	<i>Students will be skilled at...</i> Constructing an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

	<div>KEY VOCABULARY</div> <div>Deoxyribonucleic Acid, Nucleotide, Nitrogenous Base, Semiconservative Replication, Helicase, DNA Polymerase, Transcription, Translation, Codon, Mutation, Protein, Enzyme, Denaturation, Activation Energy, Competitive Inhibition, Allosteric Inhibition, Endergonic, Exergonic</div>	
Stage 2 – Evidence		
Evaluative Criteria	Assessment Evidence	
What criteria will be used in each assessment to evaluate attainment of the desired results?	<div>PERFORMANCE TASK(S):</div> <div><ul style="list-style-type: none">DNA Structure Modeling LabProtein Synthesis Modeling ActivityMutations Project</div>	<div>Differentiation Considerations:</div> <div><ul style="list-style-type: none">Grouping of studentsSplit Screen ActivitiesScaffolding of Information</div>
What criteria will be used in each assessment to evaluate attainment of the desired results?	<div>OTHER EVIDENCE:</div> <div><ul style="list-style-type: none">Quizzes and Unit ExamChoice of the following:<ul style="list-style-type: none">DNA Replication Modeling Activity (story board)Enzyme Structure & Function Lab</div>	<div>Differentiation Considerations:</div> <div><ul style="list-style-type: none">Grouping of studentsSplit Screen ActivitiesScaffolding of Information</div>