Planned Course: Genetics	Course Number: S407	Department: Science	
Unit: DNA: Structure and Function Estimated Time: 4 weeks	Grade Level: 10-12 Level/Track:	Date Approved: 8/24/09	
PA Academic Standards	**Core Concepts (in question format)** • **Skills/Knowledge**	**Activities/Strategies/Study Skills (identify some activities as remedial or enrichment activities)**	**Assessments (include types and topics)**
ASSESSMENT ANCHOR S11.B.1.1.1 Explain how structure determines function at multiple levels of organization	▶ How does the structure of DNA relate to its functions? • Students will be able to discuss why DNA's shape is linked to traits. ▶ What is the Chemical Composition of DNA? • Students will be able to explain what a sugar-phosphate back is and its importance in DNA structure. • Students will be able to discuss base pairing rules and the importance of Hydrogen bonds.	– Teacher lecture on chemical composition of DNA – Transparencies of DNA – DNA diagrams – Lab – construction of DNA molecule – Video – "DNA—The blueprint of life"	All assessments are aligned to the core concepts: • Labeling Worksheet • Homework • Lab worksheet and constructed model on DNA • Chapter exam
S11.B.1.1.3 Compare and contrast cellular processes.	▶ How does the structure of the DNA double helix allow for easy replication of the molecule? • Students will be able to discuss why the bonds are easily broken. ▶ How does transcription compare to DNA replication? ▶ How do transcription and translation compare? ▶ How do transcription and translation play a role in	– Teacher lecture – Models – Transparencies – Lab – Simulation of DNA replication – Video – "Protein Synthesis"	• Worksheets • Diagrams • Homework • Chapter exam – essays, multiple choice, matching

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	interpreting the Genetic Code? • Students will be able to discuss how each of these processes is related to cell replication and protein synthesis.		
S11.B.2.1.2 Explain the role of mutations, differential reproduction, and gene recombination in changing the genetic makeup of a population.	▶ What types of genetic disorders/conditions can arise as a result of mutations? • Students will be able to explain substitutions vs. frame shifts. ▶ How are recombination and mutations essential ingredients in establishing new varieties of life? • Students will be able to will explain how mutations are linked to evolution.	– Teacher lecture – Handouts – Transparencies – Worksheets – Video – "I am not a Freak"	• Chapter exam questions • Worksheets • Diagrams • Homework • Video worksheet
S11.B.2.1.3 Explain the role of Selective Breeding and Biotechnology in changing the genetic makeup of a population.	▶ What are some biological techniques that can be used in a lab to alter the genetic makeup of organisms? ▶ What are some advantages to selective Breeding and	– Teacher lecture – Worksheets – Video – Transparencies	• Homework • Worksheets • Chapter Exam questions

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	Biotechnology? ▶ What are some drawbacks to selective Breeding and Biotechnology? • Students will be able to discuss medical advances that have been achieved d/t genetic technologies. • Students will be able to discuss what types of impacts this new technology may have on future species and new varieties of organisms.		