Unit 4: Biology Pacing Guide

Teachers of Biology must become familiar with and implement the NYS *Process Strands:* The process strands (problem solving, relationships, processes, mechanisms, models and applications of biological concepts). These process strands help students in attaining science literacy, generate explanations, exhibit creative problem solving, and make informed decisions on the living environment and scientific inquiry.

Genetics is the 4th of 7 units within the Biology course. (**Key Idea 2**) Organisms inherit genetic information in a variety of ways that result in continuity of structure and junction between parents and offspring.

Weeks 5	Content Bands & Student Expectations	Performance Indicators – Major Understandings	Essential question(s), Textbook connection, Suggested Labs/Activities	Vocabulary
Unit 4 Genetics	**Genetics** **Introduction to Genetics** Students will be able to recognize the work of Gregor Mendel. **Crossing Over** Students will be able to demonstrate crossing over. **Environment influences gene expression** Students will explain gene expression. **DNA & Protein Synthesis** Describe how genotype translates to phenotype. **Biotechnology** Identify how biotechnology helps to compare and study genes and proteins, and how it is applied in health care, research and agriculture.	**P.I. 2.1** 1:1.1b 1:3.2 4:2.1b 4:2.1c 4:3.1c 4:2.1a 4:2.1k 4:2.1f 4:2.1g 4:1.2i 4:2.1j 4;5.2i **P.I. 2.2** 4:2.2c 4:4.1.b 4:2.2e 4:2.2a 4:2.2b 4:2.2d	**Essential Question:** How do genes influence the development of traits? **Textbook Connection:** Chapter 6.3, 6.4 **Essential Questions:** How does crossing over during meiosis increase genetic diversity? **Textbook Connection:** Chapter 6.6 **Essential Questions:** How does environment influence gene expression? **Textbook Connection:** Pages 207 and 217 **Essential Questions:** How is DNA a template for all living things? **Textbook Connection:** Chapter 8.2, 8.3, 8.4, 8.5, **Essential Questions:** How is technology used to investigate and manipulate genetics? **Textbook Connection:** Chapter 9.1,2,3,4, p.277, 9.5, 9.6 **Suggested Labs/ Activities:** Required NYS Lab – Relationships in Biodiversity Karyotyping Extracting DNA	Trait Genetics Gene Allele Homozygous Heterozygous Genotype Phenotype Karyotype RNA or messenger molecule Restriction enzyme Gel electrophoresis DNA fingerprinting Clone Genetic engineering Recombinant DNA Genetic screening Gene therapy Segment

Enduring Understanding: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science as it pertains to Biology.