

Name of Course: Genetics

Course Overview:			
This one-trimester genetics elective is designed to give students at Wells High School a general overview of all the components necessary to understand the significance of genetics in the modern world. Throughout the term, the class will investigate current topics and discoveries in the ever-changing field of genetics! Topics covered include molecular genetics, genes & chromosomes, genetic variation & mutations, inheritance & expression, genetic disorders, and genetic bioethics.			
Unit of Study	Essential Question(s)	Content/Skill/Concept	Instructional Strategies
DNA & Cell Division	What are the basic units of genetics?	DNA structure; DNA replication; cell division (meiosis & mitosis); current events in genetics.	Hands-on DNA models, Naked Genetics podcast, instructional videos and demonstrations, virtual PCR lab, Mitosis/Meiosis simulation genetics current event, "DNA Episode 1 - The Secret of Life"
Chromosomes & Gene Expression	How does our DNA code for all of our traits? What happens when things go wrong?	Transcription & translation; gene editing strategies; chromosomal structure; chromosomal abnormalities & disorders; current events in genetics.	transcription/translation practice problems, genetic current event, CRISPR podcast, karyotyping activity, "DNA Episode 2 - Playing God"
Genetic Variation	What makes everyone so unique? How do "nature" and "nurture" interact?	Natural genetic variation; genetic disorders; epigenetics and methylation; current events in genetics.	Genetic Condition Project , epigenetics WebQuest, methylation videos, mutations practice worksheet, genetics current event
Inheritance	How do we inherit our traits from our parents?	Genetic inheritance; Mendelian and non-Mendelian inheritance; blood typing; <i>Drosophila</i> life cycle, scoring, and reproduction; current events in genetics.	RadioLab "Inheritance" podcast, Mendelian and non-Mendelian crosses practice, <i>Drosophila</i> lab, genetics current event, paternity test lab, "DNA Episode 3 - The Human Race" Understanding your Blood Type
Gene Therapy & Cancer	How can genetics be used in medicine? Can we cure cancer with genetics?	Gene therapy strategies; cancer & genetics; current events in genetics.	Gene therapy WebQuest, genetics current event, CRISPR Review , "DNA Episode 4 - Curing Cancer"
Genetic Transformation	What protocols do scientists use to study how genes work?	Types of vectors; genetic transformation.	Intro to Vectors WebQuest, pGLO lab