

UNIT OF STUDY

Title: Introduction to Genetics	Subject/Course: Biology	Length: 2 weeks
Topic: Heredity and Evolution 1	Grade: 10	Designer: Woods
UNIT GOALS AND EXPECTATIONS		
IMPORTANT CONCEPTS/UNDERSTANDINGS: In all organisms, the instructions for specifying the characteristics of the organism are carried in DNA, a large polymer formed from subunits of four kinds (A, G, C, and T). DNA resides in the nuclei of cells and contains the genetic information that underlies heredity. Most of the cells in a human contain two copies of each of 22 different chromosomes. In addition, there is a pair of chromosomes that determines sex: a female contains two X chromosomes and a male contains one X and one Y chromosome. Transmission of genetic information to offspring occurs through egg and sperm cells that contain only one representative from each chromosome pair. An egg and a sperm unite to form a new individual. The fact that the human body is formed from cells that contain two copies of each chromosome – and therefore two copies of each gene – explains many features of human heredity, such as how variations that are hidden in one generation can be expressed in the next.	ESSENTIAL QUESTIONS: What did Gregor Mendel do to reveal the patterns of inheritance in pea plants? How are punnett squares used to determine probability? What patterns of inheritance are present in humans? How does the body help maintain a constant number of chromosomes from generation to the next? What is a karyotype and what information can it provide about a persons’ genetics?	
STUDENT LEARNING EXPECTATIONS: HE.4.B.1 Summarize the outcomes of Gregor Mendel’s experimental procedures and differentiate among the laws and principles of inheritance: <ul style="list-style-type: none">▪ dominance▪ segregation▪ independent assortment (HE.4.B.2) HE.4.B.3 Use the laws of probability and Punnett squares to predict genotypic and phenotypic ratios MC.2.B.10 Analyze the meiotic maintenance of a constant chromosome number from one generation to the next and examine different modes of inheritance: <ul style="list-style-type: none">▪ sex linkage▪ crossing over▪ multiple alleles (HE.4.B.4)▪ nondisjunction	HE.4.B.5 Analyze the historically significant work of prominent geneticists <ul style="list-style-type: none">▪ Watson and Crick▪ Craig Venter HE.4.B.6 Evaluate karyotypes for abnormalities: <ul style="list-style-type: none">• monosomy• trisomy	
SPECIFIC DECLARATIVE KNOWLEDGE –know Describe how Mendel studied inheritance in peas. Summarize Mendel’s conclusions about inheritance. Explain the principle of dominance. Describe what happens during segregation. Explain how geneticists use the principles of probability. Describe how geneticists use punnett squares. Explain the principle of independent assortment. Describe other patterns of inheritance. Explain how Mendel’s principles apply to organisms. Contrast the chromosome number of body cells and	SPECIFIC PROCEDURAL KNOWLEDGE –do Use a punnett square to determine genetic probabilities. Create abnormal karyotypes.	

gametes. Summarize the events of meiosis. Contrast meiosis and mitosis. Identify the abnormalities on a karyotype.	
UNIT ASSESSMENTS (Include tasks related to Dimensions 3 and 4 and Bloom's Taxonomy)	
"Call It... Dominant or Recessive" Lab Assignment "Karyotyping Lab" Assignment "Strawberry DNA Isolation/Cheek Cell DNA Isolation"- Lab Current Event Open Response	
Traditional Assessments: Written Test Quizzes	Other Evidence of Learning: Bellringers Informal Questioning
ACTIVITIES AND LEARNING EXPERIENCES	
Punnett Practice -Individual Practice Powerpoint Lecture with Discussion Vocabulary Strategy Daily Notebook Entries Establish Habits of Mind for Science in Critical Thinking, Creative thinking, and Self Regulated Thinking Open Responses to analyze historical events Guest Speaker/Field Trip	Resources Prentice Hall Textbook: Biology CBL's Internet Powerpoint Lab Equipment
Career Connections	
Genetics Counselor	