

**Center for Talented Youth
Genetics Syllabus**

Text:

Snustad & Simmons. *Principles of Genetics*, 3rd ed. John Wiley & Sons, Inc., New York.

WEEK 1:

Date	Topics	Activities	Text Chapters
Day 1	The Cell, DNA Basics, Mitosis, Meiosis	Lab Safety Cell Scavenger Hunt Cell Cycle Activities Meiosis Square Dancing	Ch 2-3
Day 2	Mendelian Genetics	Mono- & Dihybrid crosses Chi Square Analysis Human Genetic Traits	Ch 4
Day 3	Mendelian Extensions, Complex Patterns of Inheritance: Codominance, Pleiotropy, Epistasis	Human Genetic Traits ABO/Rh blood typing, Case Studies Pedigree Analysis Virtual Fly Lab Computer lab 1-3pm (internet access)	Ch 6
Day 4	Chromosomes: Structure, Basis for Heredity, Chromosomal Disorders	Sex Determination Sex Linkage & Linkage Analysis Karyotyping	Ch 7
Day 5	Recombination & Linkage	WEEKLY QUIZ! Linkage & Recombination ReeBops I & II	Ch 8

WEEK 2:

Date	Topics	Activities	Text chapters
Day 6	DNA: structure & discovery of the molecule	Analysis of Classical Experiments DNA extraction Macromolecule Testing	Ch 10-11
Day 7	DNA to RNA: Transcription & Translation	Codon Game 10-11am Library presentation library research for scrapbooks	Ch 12-13
Day 8	Mutation & DNA Repair Gene Regulation	Telephone / Mutations Game lac operon regulation Electrophoresis I: Loading Practice	Ch 14
Day 9	Bacterial Genetics I: Transformation & Transduction	Transformation of <i>E. coli</i> with fluorescent blue and green plasmids Transduction to produce Antibiotic Resistance	Ch 23 & 24
Day 10	Bacterial Genetics II: Conjugation & Plasmid Mapping	WEEKLY QUIZ! Restriction digest and plasmid mapping (electrophoresis)	Ch 23 & 24

WEEK 3:

Date	Topics	Activities	Text chapters
Day 11	Biotechnology & Molecular Genetics	Forensic DNA Fingerprinting (electrophoresis)	Ch. 20
Day 12	Human Variation	Human VNTR: PCR Amplification & Analysis of population Scrapbook Project due	supplemental materials
Day 13	Hardy-Weinberg & Population Genetics	Analysis of Gene Flow Equilibrium Modeling Case Studies GATTACA: video	Ch 29
Day 14	Genetics & Ethics Genetics of Cancer	GATTACA Discussion NIH Genes & Cancer Module Scrapbook Presentations	Ch 28
Day 15	Course Wrap-up	Review Game Parent Conferences	