

Genetics
CTY Course Syllabus

		Content	Method
Sunday Opening Day	SH	- Pre-test	
Day 1	AM	- Chapter 1: Genetics - Chapter 2: Mendel's Breakthrough: Patterns, Particles, and Principles of Heredity	- Discussion - PowerPoint Presentation
	PM	- Lab: Genetics of Plants - Activity: Genes and Probability - Activity: Mendelian Diseases	- Lab - Partner Activity - Student Presentation
	SH	- Chapter 2: Problem Set - Reading from <i>The Monk in the Garden</i> by Robin Marantz Henig	- Individual Work Reading
Day 2	AM	- Review Chapter 2 Problem Set - Chapter 3: Extensions to Mendel: Complexities in Relating Genotype to Phenotype - Chapter 4: The Chromosome Theory of Inheritance - Activity: Chromosome Simulation	- Q/A - PowerPoint Presentation - Group Activity
	PM	- Lab: Genetics of Drosophila - Activity: Analyzing Chromosomes Through Karyotyping Chromosome Simulation	- Lab - Partner Activity
	SH	- Chapters 3 and 4 Problem Set	- Individual/Partner Work
Day 3	AM	- Review Chapters 3 and 4 Problem Sets - Chapter 5: Linkage, Recombination, and the Mapping of Genes on Chromosomes - Chapter 6: DNA: How the Model of Heredity Carries, Replicates, and Recombines Information	- Q/A - PowerPoint Presentation - PowerPoint Presentation
	PM	- Lab: What Does DNA Look Like? - Lab: Size Determination of DNA Restriction Fragments - Activity: DNA Models	- Lab - Lab - Individual Activity
	SH	- Chapters 5 and 6 Problem Set - Reading: from <i>The Double Helix</i> by James Watson	- Individual/Partner Work
Day 4	AM	- Review Chapters 5 and 6 Problem Sets - Chapter 7: Anatomy and Function of a Gene: Dissection Through Mutation - Chapter 8: Gene Expression: The Flow of Information from DNA via RNA to Protein	- Q/A - PowerPoint Presentation - PowerPoint Presentation
	PM	- Chapters 7 and 8 Problem Set - Review Game	- Individual/Partner Group Activity

		Content	Method
	SH	- Review Chapters 7 and 8 Problem Set Study	- Q/A - Individual Work
Day 5	AM	- Exam I Chapters 1-8 - Reading from <i>Genome: The Autobiography of a Species in 23 Chapters</i> by Matt Ridley - Chapter 11: The Direct Detection of Genotype Distinguishes Individual Genomes	- PowerPoint Presentation
	PM	- Lab: In Search of the Sickle Cell Gene	- Lab
Sunday	SH	- Lab: In Search of the Sickle Cell Gene (cont.) - Movie: GATTACA	- Lab - Movie
	AM	- Chapter 9: Deconstructing the Genome: DNA at High Resolution - Special Topic: Human Genome Project - Chapter 13: Chromosomal Rearrangements and Changes in Chromosome Number Reshape Eukaryotic Genomes	- PowerPoint Presentation - PowerPoint Presentation
Day 6	PM	- Lab: In Search of the Sickle Cell Gene (cont.) - Lab: PCR-based VNTR Human DNA Typing	- Lab - Lab
	SH	- Lab: PCR-based VNTR Human DNA Typing (cont.) - Essay: Genetic Testing	- Lab - Individual Work
	AM	- Chapter 10: Reconstructing the Genome through Genetic and Molecular Analysis - NCBI Website Activity	- PowerPoint Presentation - Computer Activity
Day 7	PM	- Lab: Blue/White Cloning of a DNA Fragment - Lab: DNA mapping Using Restriction Enzymes	- Lab - Lab
	SH	- Chapters 9, 10, 11 and 13 Problem Set	- Individual/Partner Work
	AM	- Review Chapters 9, 10, 11 and 13 Problem Sets - Chapter 14: The Prokaryotic Chromosome: Genetic Analysis in Bacteria - Chapter 16: Gene Regulation in Prokaryotes	- Q/A - PowerPoint Presentation
Day 8	PM	- Lab: Blue/White Cloning of a DNA Fragment (cont.)	- Lab
	SH	- Chapters 14 and 16 Problems Sets	- Individual/Partner Work
	AM	- Review Chapters 14 and 16 Problem Sets - Chapter 12: The Eukaryotic Chromosome: An Organelle for Packaging and Managing DNA - Chapter 17: Gene Regulation in Eukaryotes	- Q/A - PowerPoint Presentation - PowerPoint Presentation
Day 9			

		Content	Method
	PM	- Chapters 12 and 17 Problem Sets	- Individual/Partner Group Activity
	SH	- Review Chapters 12 and 17 Problem Set - Study	- Q/A - Individual Work
Day 10	AM	- Exam Chapters 9-14, 16, 17 - Reading from Chapter 15: The Chromosomes of Organelles Outside the Nucleus Exhibit Non-Mendelian Patterns of Inheritance	- Reading - PowerPoint Presentation
	PM	- Lab: Mitochondrial DNA Analysis Using PCR	- Lab
Sunday	SH	- Chapter 15 Problem Set	- Individual/Partner Work
Day 11	AM	- Review Chapter 15 Problem Set - Chapter 19: Using Genetics to Study Development - Special Topics: Stem Cells and Cloning	- Q/A - PowerPoint Presentation - Lab
	PM	- Lab: Zebrafish	- Lab
	SH	- Model Organisms	- Group Project
Day 12	AM	- Chapter 18: Cell Cycle Regulation and the Genetics of Cancer	- PowerPoint Presentation - Reading
	PM	- Lab: In Search of the Cancer Gene	- Lab
	SH	- Model Organisms	- Group Project
Day 13	AM	- Chapter 20: The Genetic Analysis of Populations and How They Evolve - Lab: Heredity of Human Traits	- PowerPoint Presentation - Lab
	PM	- Model Organism Presentations	- Group Presentations
	SH	- Chapter 20 Problem Set	- Individual/Group Work
Day 14	AM	- Review Chapter 20 Problem Set - Chapter 21: Evolution at the Molecular Level - Film: PBS Evolution	- Q/A - PowerPoint Presentation - Film
	PM	- Study	- Individual Work
	SH	- Post-test	
Day 15	AM	- Closing	