

## *Biotechnology*

<b>Day</b>	<b>Time</b>	<b>What</b>	<b>How</b>
1	Morning	Warm Up  Notebook Organization/Agendas Setting the Stage  Learning Logs  Problem Solving in Science: The Scientific Method  History of Biotechnology  Review of Cell Structures  Pre Assessment	Listening Activity – marble notebooks  Discussion and handouts on Lab Safety Protocol  Discussion of set up and usage  PowerPoint and solving the Hijacking Mystery using the steps of the Scientific Method PowerPoint and discussion  Cell Organelle Wanted Posters Pre-test
	Afternoon	<b>Lab # 1 – Introduction to Microscopes</b>  <b>Lab # 2 Chromosomes &amp; Genes (examination of Drosophila Salivary gland slides)</b>	Thread Slides and HUB Paintings Mystery  Pre-Lab Discussion of Chromosomes ⇒ Structure ⇒ Function ⇒ Types How to make Biological Drawings
	Study Hall	Cell Organelle Function Directed Reading: Chapter 1 and questions	Wanted Posters(Computer Lab)
2	Morning	Cell Organelle Review  Introduction to Mitosis Cell Cycle  Meiosis  Differences between mitosis & meiosis  Begin DNA Video	Scientific Method Vocabulary Wanted Poster Gallery Walk  PowerPoint, class discussion; handouts Video & guide sheet Class discussion “Why can’t mitosis work for humans?” Somatic Cell Math handout Video: Meiosis: Key to Genetic Diversity & guide sheet  Race for the Double Helix
	Afternoon	Meiosis – Internet Lesson	Animated Meiosis Lab Online Quiz and Activities
	Study Hall	Lab Reports Lab # 1 and # 2  Meiosis/Mitosis Activity	Lab notebooks Mitosis & Meiosis handouts DRA pp. 24 – 38; p. 39 # 3, 16, 21, & 28 Fill-in-Blank and Word search

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3	Morning	DNA – An Introduction History of DNA PowerPoint CD and writing assignment  The Double Helix – Race for the Discovery (Video)	Class Discussion and PowerPoint Journal Entry # 3 Directed Reading pp. 178 – 193 p. 195 # 1, 3, 9, 10, 11, 12, 13, 15 Handouts on DNA and replication Challenge Vocabulary Video Guide Questions  JE #4 - How's it going?
	Afternoon	Introduction to Gel Electrophoresis <b>Lab # 3 DNA Extraction</b>  Assign Genetic Disorder Topics	PowerPoint/Class discussion/Handout Edvotek: Isolation & Extraction of DNA from <i>E. coli</i> DRA & guide questions
	Study Hall	Finish The Double Helix Ethics of Watson & Crick Discovery	JE # 5 – “Were Watson & Crick ethical?”
4	Morning	Warm Up – Central Dogma  DNA Replication Transcription Structure of DNA  Chromosomal Mutations ⇒ Insertions ⇒ Deletions ⇒ Translocation ⇒ Repetitions  Detection of mutations by DNA Sequencing and interpretation of significance on protein formed  Introduction to Translation/Protein Synthesis	Student handout and discussion  PowerPoint and Class discussion Class notes and Clint Eastwood Cut & Paste Activity Directed Reading and guide questions  Class discussion/OH Presentation & textbook references  JE#6 – “Definition of Life”  PowerPoint, Class Discussion, and Handouts
	Afternoon	<b>Lab 4: Sickle Cell Anemia Detection by Gel Electrophoresis</b>	Handouts and class discussion  Lab Warm up: What is sickle cell? Review of Gel Electrophoresis
	Study Hall	Finish <b>Lab 4: Sickle Cell Anemia Detection by Gel Electrophoresis</b>	Class Discussion of heritable diseases and final gels

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5	Morning	Ethical Dilemma: Video: GATTACA	Joint activity with second Biotech section Writing response on one of the dilemma and student personal response  JE#7 – GATTACA Ethical Dilemma
	Afternoon	<b>Lab# 5: Wildlife Forensics</b>	Edvotek Shark Fin Origin Lab
	Study Hall	Complete <b>Lab# 5: Wildlife Forensics</b> Lab Corrections	
6	Morning	Completion of Chromosomal Mutations Protein Synthesis  Patterns of Inheritance Mendelian Genetics Mono & dihybrid crosses Incomplete dominance Multiple Alleles Genetics of Blood Groups Gene Mapping Probability	Class discussion & worksheet practice  Video: Patterns of Inheritance Class discussion Practice Genetic Problems – Teacher led and student worksheet Genetic Problems Handout
	Afternoon	<b>Lab # 7: Human Heredity</b>	Class data and histogram, Discussion of dominance/recessive traits Observation of types of inheritance
	Study Hall	Protein Synthesis and Genetic Code Practice  Complete labs/Genetic Problems	Worksheets/Book Activity
7	Morning	Warm Up Assign Genetic Disorder Introduction to Restriction Enzymes  <b>Lab #8: DNA Scissors</b>	Palindromes, Types of R.E. – Purposes and Uses  Restriction Enzymes Cut & Paste Lab
	Afternoon	<b>Lab #9: A Lab on the Inheritance of Blood Types</b>	Discussion of Lab results and review of blood type inheritance
	Study Hall	Computer Lab	Genetic Disorder Research & Power Points
8	Morning	The Case of Nathaniel Wu  Introduction to Cloning Weird AI Lightning bugs & tobacco Plants	JE # 8 – Would you hire him?  How to Clone a Gene Lab Transformation

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	Afternoon	<b>Lab # 10 DNA Autorad Mutations</b>	Find chromosomal mutations and analyze proteomic consequences
	Study Hall	Lab Completion Computer Lab	Genetic Disorder Research
9	Morning	PCR Reading in Textbook D Q Alpha 1  Review Cloning/Transformation	Power Point Presentation  Class Discussion of cloning, plasmids, bacteria
	Afternoon	<b>Lab # 11 Transformation of GFP gene into E. coli and turn on the gene with the use of arabinose (BIO-RAD)</b>	Class Discussion of cloning, plasmids, bacteria  Lab Restriction Enzyme Digest (BIO-RAD)
	Study Hall	Review Computer Lab Begin to Prepare for Research Presentations	Directed Reading Individual & group work Genetic Disorder Research & completing Power Points
10	Morning	Gene Splicing & Big Business Ethics: Letter to friend re: taking HGH Genetic Disorder - ALD	Discussion and review of Transformation Lab Writing Prompt JE #9 – Do you recommend HGH?  Lorenzo's Oil movie
	Afternoon	Continue <b>Lab # 11 Transformation of GFP gene into E. coli and turn on the gene with the use of arabinose</b>	Evaluation of Transformation Plates to set up GFP Labs
	Study Hall	Individual Reading and prep for Genetic Disorder Projects Complete any unfinished labs	Turn in Transformation Lab
11	Morning	GFP lesson Southern Blotting DNA Fingerprinting  The Innocence Project Class Discussion on Sam Sheppard Trial	Lab GFP cont Class discussion  Video on Sam Sheppard Trial
	Afternoon	Applications of DNA Science <b>LAB # 12 – Who Committed the Crime? BIO-RAD</b>	
	Study Hall	Read gels from RFLP Lab Lab Notebooks & Corrections Those Finished: <b>Lab # 13 Microarrays</b>	Study/Textbook

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12	Morning	<b>Lab # 14 A Paternity Case</b> <b>Lab # 15 A Criminal Case</b>  FORENSICS – RFLP Case Studies Analysis	Who's the father? Who committed the crime?
	Afternoon	Complete Unfinished Worksheets, Genetic Disorder Projects, Labs	Catch-up
	Study Hall	Begin Lab Corrections <b>Lab # 16 DNA Fingerprinting</b>	Gel Dist vs. Semi-log graph BIORAD
13	Morning	"Eye of Nye" video  Begin Genetic Disorder Presentations	Class Discussion GM foods – JE #10 - GM Foods
	Afternoon	Continue Genetic Disorder Presentations	
	Study Hall	Cancer Genetics - Cancer and the Cell Cycle; The Two Hit Theory of Cancer	
14	Morning	Evaluations Finish Genetic Disorder Presentations  Two-person Presentations	Various advanced topics in Biotech
15	Afternoon	The Clone Age	Video on Cloning and Ethics
	Study Hall	Post-Test	
	Morning	Class Discussion	