Biotechnology
CAA Syllabus

Day	Time	What	How
1	Morning	Warm Up Noteboook 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	***Lab* # 1 – Introduction to Microscopes** ***Lab* # 2 Chromosomes & Genes (examination of Drosophila Salivary gland slides)**	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	*Warm up* Cell Organelle Review Introduction to Mitosis Cell Cycle	Scientific Method Vocabulary Wanted Poster Gallery Walk PowerPoint, class discussion; handouts Video & guide sheet
	Afternoon	Meiosis Differences between mitosis & meiosis	Class discussion "Why can't mitosis work for humans?" Somatic Cell Math handout Video: Meiosis: Key to Genetic Diversity & guide sheet
	Study Hall	Lab Reports Lab # 1 and # 2 Review and grading Mitosis lab	Lab notebooks Mitosis & Meiosis handouts DRA pp. 24 – 38; p. 39 # 3, 16, 21, & 28 Mitosis animal and plant slides

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3	Morning	DNA – An Introduction CD and writing assignment	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 JE #4 - How's it going?

	Afternoon	Introduction to Gel Electrophoresis ***Lab # 3 DNA Extraction*** Assign Genetic Disorder Topics	PowerPoint/Class discussion/Handout Edvotek: Isolation & Extraction of DNA from *E. coli* DRA & guide questions
	Study Hall	Finish The Double Helix Ethics of Watson & Crick Discovery	JE # 5
4	Morning	DNA Replication Transcription	Powerpoint and Class discussion Class notes and Clint Eastwood Activity Directed Reading and guide questions
	Afternoon	***Lab 4: Sickle Cell Anemia Detection by Gel Electrophoresis***	Handouts and class discussion Lab Warm up: What is sickle cell? Review of Gel Electrophoresis
	Study Hall	Finish ***Lab 4: Sickle Cell Anemia Detection by Gel Electrophoresis***	Class Discussion of heritable diseases and final gels, have ready to turn in
5	Morning	Question & Answer Session Warm Up Chromosomal Mutations ⇒ Insertions ⇒ Deletions ⇒ Translocation ⇒ Repetitions Detection of mutations by DNA Sequencing and interpretation of significance on protein formed Group research on a genetic disorder- is it an insertion, a deletion, a translocation, or repetition? Discuss bioethics involved	Class discussion Student handout and discussion Class discussion/OH Presentation & textbook references Computer lab
	Afternoon	***Lab# 5: Wildlife Forensics***	Edvotek Shark Fin Origin Lab
	Study Hall	Lab Corrections Continue Genetic Disorder Projects	Computer Lab
Day	**Time**	**What**	**How**
6	Morning	Completion of Chromosomal Mutations DNA Mutations and Repair Mechanism Patterns of Inheritance Mendelian Genetics Mono & dihybrid crosses	 OH/Class discussion & outline completion Video: Patterns of Inheritance Class discussion Practice Genetic Problems –

		Incomplete dominance Multiple Alleles Genetics of Blood Groups Gene Mapping Probability	teacher led and student worksheet Genetic Problems Handout
	Afternoon	***Lab # 7: Human Heredity***	Class data and histogram, Discussion of dominance/recessive traits Observation of types of inheritance
	Study Hall	Computer Lab	Work on Genetic Disorder Project *** "Who killed the RA?" – Dorm event**
7	Morning	Warm Up Introduction to Cloning Weird Al Lightning bugs & tobacco Plants	 How to Clone a Gene Lab Transformation
	Afternoon	***Lab #8: A Lab on the Inheritance of Blood Types***	Discussion of Lab results (Sneaky Instructor Error) and review of blood type inheritance
	Study Hall	Computer Lab	Genetic Disorder Research & completing Power Points
8	Morning	The Innocence Project The Case of Nathaniel Wu	Video on Sam Sheppard Trial Ethical analysis of hiring of person with Huntington's Disease JE # 6 – Would you hire him?
	Afternoon	***Lab # 9 Transformation of GFP gene into E. coli and turn on the gene with the use of arabinose***	Class Discussion of cloning, plasmids, bacteria
8	Study Hall	Lab Completion Class Discussion on Sam Sheperd Trial	JE # 7 – Sam Shepperd Case
9	Morning	Palindromes Restriction Enzymes: Types, Purpose, & uses ***Lab # 10 DNA Scissors*** PCR Reading in Textbook D Q Alpha 1	Power Point Presentation ***Lab*** Restriction Enzyme Digest *(BIO-RAD)* *** "Who killed the RA?" – Cafeteria event**
	Afternoon	Continue ***Lab # 9 Transformation of GFP gene into E. coli and turn on the gene with the use of arabinose*** *(BIO-RAD)*	Evaluation of Transformation Plates to set up GFP Labs
	Study Hall	Review Computer Lab Begin to Prepare for Research Presentations	Directed Reading Individual & group work Genetic Disorder Research & completing Power Points
10	Morning	Warm up Gene Splicing & Big Business Simulation of Gene Splicing lab Ethics: Letter to friend re: taking HGH	Discussion and review of Transformation Lab Writing Prompt JE #8 – Do you recommend HGH?

	Afternoon	***Lab # 10 DNA Autorad Mutations***	Find chromosomal mutations and analyze proteomic consequences
	Study Hall	Individual Reading and prep for Gen.Dis.Pres. (Computers) Complete any unfinished labs	Turn in Transformation Lab
11	Morning	GFP lesson 3 Southern Blotting DNA Fingerprinting	Lab GPF cont Class discussion
	Afternoon	Applications of DNA Science ***LAB # 11 – Who Committed the Crime? BIO-RAD***	Review of "Who killed the RA?" events (visits by the RAs involved)
	Study Hall	Read gels from RFLP Lab Lab Notebooks & Corrections	Study/Textbook
12	Morning	GFP Lesson 4 FORENSICS – RFLP Case Studies Analysis	
	Afternoon	***Lab # 12 A Paternity Case*** ***Lab # 13 A Criminal Case***	Who's the father? Who committed the crime? *** "Who killed the RA?" – Cafeteria arrest**
	Evening	Computer Lab – Finish Genetic Disorder Presentations Begin Lab Corrections	
13	Morning	Microarrays "Eye of Nye" video Cancer Genetics - Cancer and the Cell Cycle; The Two Hit Theory of Cancer	Class Discussion GM foods – JE #9 - GM Foods
	Afternoon	Begin Genetic Disorder Presentations	
	Study Hall	Finish Genetic Disorder Presentations	
Day	Time	What?	How
14	Morning	Evaluations Lab Notebook Doctor: Reorganization, fill in missing gaps, correct all labs	Time spent reviewing with instructors
	Afternoon	***Lab # 14 Microarrays***	Discussion of Lab Questions and Answers
	Study Hall	Classroom cleanup Anything else you'd like to learn?	Class Discussion
15	Morning	***Something the Lord Made*** – movie	Watch with BIOTb