FRANKLIN-SIMPSON HIGH SCHOOL

Course Name: Biology **Unit Name:** **Unit 8 – Genetics and Biotechnology**

Quality Core Objectives:

Unit 12 Mendel's Peas: A Study of Mendelian Genetics	
C.1. Genetics	f. Describe the basic process of meiosis
	g. Identify and explain Mendel's law of segregation and law of independent assortment
	h. Explain how the process of meiosis reveals the mechanism behind Mendel's conclusions about segregation and independent assortment on a molecular level
	i. Define and provide an example of the following: genotype, phenotype, dominant allele, recessive allele, codominant alleles, incompletely dominant alleles, homozygous, heterozygous, and carrier
	j. Explain sex-linked patterns of inheritance in terms of some genes being absent from the smaller Y chromosome, and thus males (XY) having a different chance of exhibiting certain traits than do females (XX)
	k. Construct and interpret Punnett squares and pedigree charts (e.g., calculate and predict phenotypic and genotypic ratios and probabilities)
	l. Infer parental genotypes and phenotypes from offspring data presented in pedigree charts and from the phenotypic and genotypic ratios of offspring

Purpose of the Unit:

Students will be able to discuss the identification of DNA as the genetic material, the elucidation of the structure of DNA, and the path from gene to protein. Emphasis will be placed on relating the structure of all important molecules to their function in the processes. At the end, students should be able to evaluate predictions and results of the classic DNA experiments, make predictions about other experimental setups, and predict the effects of various point mutations on transcription, translation, and phenotype.

Prerequisites:

The basic principles of biology (from earlier chapters) and biochemistry are required to understand this material.

Daily Lesson Guide

Day	Lesson Content and Daily Focus Questions	Tasks/Procedures		Engagement	Assessment and/or Accommodations
		Knowledge or Comprehension Activities	Critical Thinking (High Yield / Literacy /LTF/etc.)		
1	What are heritable traits and phenotypes? C.1.i I – ACT bell ringer (5 min) II – Trait catalogue lab (40 min) III – Refute my claim: "Traits are randomly assigned to individuals at birth"	1. ACT Bell ringer	1. Refute my claim	1. Lab (working with others)	1. Q&A 2. Refute my claim 3. Lab note books
2	How are genetic traits passed through generations? C.1.g; C.1.i; C.1.k I – ACT bell ringer (5 min) II – Guided notes (30 min) III - Monohybrid simple dominance problems (25 min)	1. ACT bell ringer	1. Advanced Organizer	1. Real world genetics problems	1. Q&A 2. Genetics Problem sets
3	How are genetic traits passed through generations?	1. ACT bell ringer	1. Advanced Organizer	1. Real world genetics	1. Q&A 2. Genetics Problem sets

	C.1.g; C.1.i; C.1.k I – ACT bell ringer (5 min) II – Guided notes (20 min) III - Monohybrid co-dominance and incomplete dominance problems (45 min)			problems	
4	How are genetic traits passed through generations? C.1.g; C.1.i; C.1.k;C.1.j I – ACT bell ringer (5 min) II – Guided notes (20 min) III - Monohybrid sex-linked problems (35 min)	1. ACT bell ringer	1. Advanced Organizer	1. Real world genetics problems	1. Q&A 2. Genetics Problem sets
5	How are genetic traits passed through generations? C.1.g; C.1.i; C.1.k;C.1.j I – ACT Bell ringer (5 min) II – Quiz (30 min) III – Grading and going over quiz (20 min)	1. ACT bell ringer			1. Quiz
6	How are genetic traits passed through generations? C.1.g; C.1.i; C.1.k;C.1.j I –ACT Bell ringer (5 min) II – Create your own genetics problems activity (50 min)	1. ACT bell ringer 2. DNA quiz	1. Create your own genetics problems	1. Create your own genetics problems (Personal response)	1. Student problems and solution guides

7	How are genetic traits passed through generations? C.1.g; C.1.i; C.1.k;C.1.j I – ACT bell ringer (5 min) II – Pedigree Guided notes (25 min) III – Pedigree problems(25 min)	1. ACT bell ringer	1. Advanced Organizer	1. Real world genetics problems	1. Q&A 2. Pedigree problems
8	How are genetic traits passed through generations? C.1.g; C.1.i; C.1.k;C.1.j I – ACT bell ringer (5 min) II – Make your own pedigree chart for a trait in your family (30 min) III – Pedigree practice questions (20 minutes)	1. ACT bell ringer	1. Creating pedigrees (non-linguistic representation)	1. Real world genetics problems	1. Student pedigree
9	How are genetic traits passed through generations? C.1.g; C.1.i; C.1.k; C.1.g I – ACT bell ringer (5 min) II – Guided notes (30 min) III - Dihybrid cross problems (25 min)	1. ACT bell ringer	1. Advanced Organizer	1. Real world genetics problems	1. Q&A 2. Genetics Problem sets

10	How are genetic traits passed through generations? C.1.g; C.1.i; C.1.k I – ACT bell ringer (5 min) II – Guided notes (30 min) III - Dihybrid cross problems (25 min)	1. ACT bell ringer	1. Advanced Organizer	1. Real world genetics problems	1. Genetic Problems 2. Q&A
12	How are genetic traits passed through generations? C.1.g; C.1.i; C.1.k I – ACT bell ringer (5 min) II – Dihyrbid data analysis (30 min) III - Dihybrid cross problems (25 min)	1. ACT bell ringer		1. Real world genetics problems	1. Data analysis problems 2. Genetic Problems 3. Q&A
13	How do organisms produce gametes? C.1.f; C.1.h I – ACT bell ringer (5 min) II – Meiosis picture lab (45 min)	1. ACT bell ringer	1. Picture lab (non-linguistic representation)	1. Lab (working with others)	1. Lab notebooks

14	How do organisms produce gametes? C.1.f; C.1.h I – ACT bell ringer (5 min) II – Meiosis Reading Annotation (20 min) III – Meiosis Organizer (30 min)	1. ACT bell ringer	1. Annotation 2. Advanced Organizer		1. Organizer
15	How does meiosis, Mendel, and genetics all affect real organisms? C.1.f; C.1.h Pipetape genetics activity (may take up to 3 days) I – Students build model chromosomes holding genes for a pipetape organism. II – student use a model pipetape cell to show meiosis. III – Groups breed pipetape creatures. IV – Students Draw the child pipetape V – Students analyze class wide data to see if their simulation matches Mendels		1. Non-linguistic representation	1. Novelty and variety	1. Models 2. Results

	predictions				
16	Unit Exam				