**Unit 4: Genetics**

**Read:**  Chapters 13, 14, and 15

**Videos**:

Meiosis: <https://www.youtube.com/watch?v=zGVBAHAsjJM&feature=youtu.be>

Mendelian Genetics: [www.bozemanscience.com/029-mendelian-genetics](http://www.bozemanscience.com/029-mendelian-genetics)

Probability in Genetics: <http://www.bozemanscience.com/probability-in-genetics>

Chromosomal Genetics: <http://www.bozemanscience.com/chromosomal-genetics>

Bozeman Lab #7 – Drosophila: <http://www.bozemanscience.com/ap-bio-lab-7-genetics-of-drosophila>

**Majority of test is genetics problems!**

Basic Mendelian genetics

Dihybrid crosses

Incomplete Dominance

Co-dominance

Epistasis

Sex-linked traits

Multiple Alleles

Blood Type – know the genotypes/phenotypes, these will not be given to you.

Recombination frequency and chromosome mapping (genetic mapping may not always give perfectly aligned percentages. Based on probability and no-infinite data sets)

**Free Response on Test will be a chi-square genetics problem-know how to interpret and explain the results of your chi-square test.**

**Objectives**:

1. Know the terms diploid and haploid.
2. Track the chromosome and chromatid number through all stages of meiosis.
3. How and why does meiosis occur?
4. Explain the events of all stages of meiosis.
5. How does meiosis increase genetic variation, thus, supporting evolution?
6. Compare the process of mitosis to the process meiosis.
7. How and when are DNA replication, chromosomal alignment, and chromosomal separation accomplished during a meiotic cell cycle?
8. How do the events of meiosis explain the observations of Gregor Mendel?
9. Be able to solve for ratios and frequencies for offspring genotypes and phenotypes.
10. Be able to use the probability laws to solve genetics problems.
11. Describe the difference between autosomes and sex-chromosomes.
12. How do the processes of segregation and independent assortment explain Mendelian (dominant or recessive) and non-Mendelian (incomplete dominance, codominance, multiple alleles, sex-linkage) inheritance patterns?
13. How do the processes of meiosis explain the inheritance patterns of unlinked and linked genes?
14. How can recombination (offspring genes different from parent) during meiosis be explained?
15. How can recombination during meiosis be used to locate genes on chromosomes and establish their relative distances (gene mapping)?
16. What are some of the ethical, social, and medical issues surrounding human genetic disorders?
17. How do the events of meiosis explain the observations of Thomas Morgan?
18. How do the interactions of multiple genes affect inheritance patterns and the expression of particular phenotypes?
19. How does the location of genes on sex chromosomes affect inheritance patterns and the expression of particular phenotypes?
20. How does the transmission of non-nuclear genes affect inheritance patterns and the expression of particular phenotypes?
21. Compare and contrast the different processes in which genetic variation is produced.
22. Explain the relationship between an organism’s environment, its genome, and its phenotype. Cite specific examples.
23. Describe the different chromosomal mutations and how non-disjunction occurs.

Grades

Statistics of Inheritance POGIL \_\_\_\_ / 10

Chapter 13 Meiosis and Sexual life cycle Questions \_\_\_\_ / 10

Chapter 13 Guided Reading questions \_\_\_\_ / 8

Chapter 15 Guided Reading questions \_\_\_\_ / 8

Chapter 14 Genetics Problems \_\_\_\_ / 10

M and M Chi Square Lab \_\_\_\_ / 10

Linked Genes pg, 303-304 \_\_\_\_ / 10

Virtual Fly Lab \_\_\_\_ / 15

Unit Test \_\_\_\_ / 45-50

Schedule

See the class website for the unit schedule