**Genetics**

**Study Guide Ch 6**

**Linkage and Recombination (section 6.1)**

Define: linkage, recombination, parental (non-recombinant) types, recombinant types, frequency of recombination, synteny,

Linkage: genes that are close together tend to be transmitted as a unit

Recombination: The alleles on a chromosome can be switched

Parental: non recombinant- the same genotype and phenotype as the parents

Recombinant: The haploid cells carrying the different genotype- not the parental genotype

Frequency of recombination: 100 \* map units: how often they are likely to undergo recombination

Synteny: Physical, genes are located on the same chromosomes but that are not linked, they undergo independent assortment

Understand the difference between independent assortment and recombination.

Be able to calculated recombination frequency

Recombination frequency = # recombinants/ total # of offspring

Understand how to use chi-square to determine if two genes are linked or not (pg.130).

Use the null hypothesis: prove that they do not undergo independent assortment

Understand what the different notations of genotypes in Drosophila represent.

Be able to distinguish parental types from recombinant types

Parentals always have the most offspring in the list

Learn the difference between cis and trans orientation of alleles.

Cis = same

Trans = opposite

Understand how and why gender in Drosophila affects recombination. They will be used for many of the problems in the text.

**Genetic Mapping (Section 6.2)**

Define: genetic map, linkage map, map unit, centimorgan, map distance, linkage group, chromatid interference, three-point crosses

Genetic map: determining the linear order and distance of separation among genes that are linked

Linkage map:

Map unit:

Centimorgan: units of map distance

Map distance: Defined by the recombination frequency \* 100

Understand the relationship between recombination frequency, map distances, centimorgans, and percent recombination

Understand that where a crossover occurs affects the presence or absence of recombinant types.

Learn how to use recombination frequencies to place genes on a genetic map.

Be able to explain why a 2-point cross cannot distinguish between 2, 3, and 4 strand double crossovers (This leads to why we use 3 point crosses for genetic mapping.)

Interference = 1 – observed/expected