

GMB II Worksheet. **Due at the start of your next lab.**

Name _____ GSI & Sect # _____ Station # _____

1) What were the results of your complementation test? What general conclusions could be drawn by combining the data of all groups in your lab?

2) Tabulate your **labs** data for the F₂ flies. Due to the actual cross that was done it is not necessary to distinguish between the male & female flies.

	Parental types	Recombinant types
Male & female flies combined		

3 Draw a chromosome containing the bristle genes and eye color including map distance by using your entire labs data (from number 2) to calculate the map distance. **NOTE:** % of recombinants is determined by taking the number of recombinants divided by the total # of progeny that can show recombination in that particular cross!! Sometimes recombination may occur but it will be masked by dominant alleles and hence those offspring cannot display the recombinant phenotype.

% recombination = _____

4) A female fruit fly heterozygous for stubby antennae and clipped wings (wings normally are long), both recessive alleles, was mated to a true-breeding wild type male. The F₁ offspring were:

	males	females
stubby and clipped	34	0
stubby and long	564	0
normal and clipped	566	0
normal and long	36	1000

A. Please construct a Punnett square that demonstrates why all of the females are of the wild type.

B. Draw the mother's genotype in genetic notation. Please double check to see that your answer is correct (i.e. does it agree with the data).

C. If the genes are linked, how far apart are they? Show your work.

Worksheet continued on the other side.

5) A mutant fruit fly was found with a pearl eye color and twisted wing. When a female from a population of true-breeding pearl-eyed and twisted wing flies was mated to a male from a true-breeding wild type population, all of the F₁ progeny were pearl-eyed with wild type wings. What information does this cross tell us? What information does it not tell us? To answer this question construct 4 Punnett squares for the various possible ways that this genetic information can be contained in the fruit flies.

- a) both traits autosomal, not linked
- b) one trait on an X chromosome, the other on an autosomal chromosome
- c) both traits linked on an autosome
- d) both traits linked on an X chromosome

Use this page to show your reasoning.

6) Generate your standard curve (*HinD* III digest of λ DNA) on the semi-log graph paper on the back.

7a) Indicate the number of your tube used for digestion. _____

7b) Indicate the size of the various fragments produced when digesting your plasmid DNA (number 1-14).

8) Your GSI or UGSI loaded two DNA samples, lanes 8 & 9. How many bands are present in each lane and how far did each band migrate? Determine the base pair length of DNA fragments found in each band.

lane 8 (cut pBLU):

lane 9 (supercoiled):

9) Indicate the size of the various fragments produced when digesting λ DNA with the restriction enzyme Eco R1. (Note that there may not be five bands)

i) _____ ii) _____ iii) _____ iv) _____ v) _____

Semi- log paper
(Plot Base-pair size (y- axis) vs. distance migrated (x-axis))

