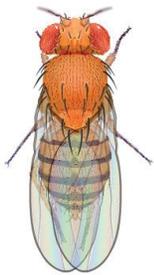


 Activity 7.1.3 Experiment 1 Vestigial Wings

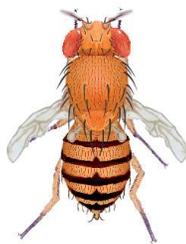
Background

In this experiment, you will examine the inheritance of a single gene that governs wing shape in *Drosophila melanogaster* fruit flies. The gene is found on the second chromosome of the fruit fly and normally results in the fly having wild flat wing shape. However, a mutant allele has been found that causes the wing to become twisted and useless. This wing shape is called vestigial and the recessive allele causing the change in shape is called the vestigial wing allele.

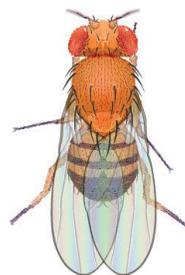
A heterozygous fly possesses an allele for the wild wing shape and an allele for vestigial wing shape. As the wild wing shape is dominant, a heterozygous fly will possess a wild wing phenotype. The symbol used for the wild allele is V and the mutant allele is v .



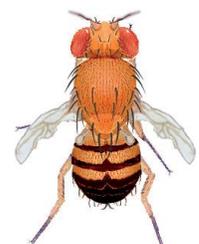
Wild Female



Vestigial Wing Female



Wild Male



Vestigial Wing Male

Procedure

1. Open the Drosophila Genetics Lab on your computer as instructed by your teacher.
2. Click on the **Reset** button and then **Select** button.
3. Select **Saved Parents** and then **Exp01_f.mfp** or **Exp01_m.mfp** (f stands for female, while m stands for male).
4. Drag each of the parents over to the **Observation Platform** and record their phenotype and genotype in question 1 of the Predictions.
5. Complete questions 2 and 3 of the Predictions to determine the probability of wild wing flies and vestigial wing flies in this mating.
6. Click the **Breed** button. Examine and record the phenotype of 100 offspring in Table 1.
7. Drag one male and one female into the **Hold Jar**.
8. Empty the **Parent/Offspring** area.
9. Drag the held flies into the **Parent** jar and select **Breed**. This is your Hybrid, or F_1 , cross.
10. Examine each parent from the hybrid cross and record their phenotype and genotype in question 4 of Predictions.
11. Complete questions 5 – 7 of the Predictions to determine the probability of wild wing flies and vestigial wing flies in this mating.
12. Examine and record the phenotype of 200 offspring in Table 2.

Predictions

- Determine the information below for each of the original parents, one of which is a homozygous wild winged individual and the other a homozygous vestigial winged individual.

Parent	Phenotype	Genotype
Female		
Male		

- Complete the Punnett Square for the parent cross.

	Genes from the male	
	_____	_____
Genes from the female		

- What would you expect the ratio of wild wing flies to vestigial wing flies to be in the Punnett Square you just completed?

_____ wild : _____ vestigial

- Determine the information below for each of the hybrid parents, who are both heterozygous, in your F1 cross.

Parent	Phenotype	Genotype
Female		
Male		

- Complete the Punnett Square for the hybrid cross.

	Genes from the male	
	_____	_____
Genes from the female		

- What would you expect the ratio of wild wing flies to vestigial wing flies to be in the Punnett Square you just completed?

_____ wild : _____ vestigial

- What are the expected ratios of genotypes in this cross? (VV : Vv : vv)

_____ : _____ : _____

Results Analysis

Table 1. Parent Cross Results

Parent Description			
Female Genotype _____		Male Genotype _____	
Female Phenotype _____		Male Phenotype _____	
Wild Wing Flies		Vestigial Wing Flies	
Female	Male	Female	Male
Total = _____	Total = _____	Total = _____	Total = _____
Total Wild Wing Flies = _____		Total Vestigial Wing Flies = _____	
Ratio of Wild wings: Vestigial Wings _____ :			

1. How does the ratio of wild : vestigial winged flies observed in the parent cross experiment compare to the ratio predicted in your Punnett Square?

Table 2. Hybrid Cross Results

Hybrid Description			
Female Genotype _____		Male Genotype _____	
Female Phenotype _____		Male Phenotype _____	
Wild Wing Flies		Vestigial Wing Flies	
Female	Male	Female	Male
Total = _____	Total = _____	Total = _____	Total = _____
Total Wild Wing Flies = _____		Total Vestigial Wing Flies = _____	
Ratio of Wild wings: Vestigial Wings _____ :			

2. How does the ratio of wild : vestigial winged flies observed in the hybrid cross experiment compare to the ratio predicted in your Punnett Square?

3. Why might there be differences in the observed and predicted phenotypic ratios?