

Name \_\_\_\_\_

AP Lab 7 Genetics of Organisms- Virtual Fruit Fly LAB

Go to Fly Genetics: <http://www.sciencecourseware.org/vcise/drosophila/>

**Cross 1: Wild Type Female x Vestigial Winged Male**

PHENOTYPE	F <sub>1</sub> Generation	F <sub>2</sub> Generation
Wild Type Males		
Vestigial Winged Males		
Wild Type Females		
Vestigial Winged Females		

Write a NULL hypothesis that describes the mode of inheritance for the trait(s) you studied.

*There is no difference between the observed data and the data expected for a*  
 \_\_\_\_\_ cross.

*I would expect this pattern in the F<sub>1</sub> offspring* \_\_\_\_\_

*I would expect this pattern in the F<sub>2</sub> offspring* \_\_\_\_\_

Are the deviations for the phenotypic ratio of the F<sub>2</sub> generation within the limits expected by chance?

To answer this question, statistically analyze the data using the Chi-square analysis.

Calculate the Chi-square statistic for the F<sub>2</sub> generation in the chart below.

Observed Phenotypes (o)	Expected (e)	(o-e)	(o-e) <sup>2</sup>	$\frac{(o-e)^2}{e}$
			X <sup>2</sup> =	

Chi-square (X<sup>2</sup>) = \_\_\_\_\_

How many degrees of freedom are there? \_\_\_\_\_

Referring to the critical values chart, what is the probability (p) value for these data? \_\_\_\_\_

What is the significance? \_\_\_\_\_

**Remember: The minimum value for rejecting the null hypothesis in the sciences is 0.05. This means that only 5% of the time would you expect to see similar data if the null hypothesis is correct OR you are 95% sure the data does not fit the expected ratio.**

**If the calculated  $X^2$  value is greater than or equal to the critical value from the table, then the null hypothesis is REJECTED.**

According to the probability (p) value, can you accept or reject your null hypothesis for this cross? Explain.

What are the genotypes of the  $P_1$  flies? FEMALE \_\_\_\_\_ MALE \_\_\_\_\_

What are the genotypes of the  $F_1$  flies? FEMALE \_\_\_\_\_ MALE \_\_\_\_\_

How is this trait inherited?

Is the mutation dominant or recessive? \_\_\_\_\_

Is the mutation autosomal or sex linked? \_\_\_\_\_

Is this  $F_1$  cross a monohybrid or dihybrid cross? \_\_\_\_\_

Make 2 Punnett squares showing parents and  $F_1$  and  $F_2$  offspring for this trait.

**Cross 2: White Eyed Female x Wild Type Male**

	F <sub>1</sub> Generation	F <sub>2</sub> Generation
Wild Type Males		
White eyed Males		
Wild Type Females		
White Eyed Females		

Write a NULL hypothesis that describes the mode of inheritance for the trait(s) you studied. (See cross #1)

*I would expect this pattern in the F<sub>1</sub> offspring* \_\_\_\_\_

*I would expect this pattern in the F<sub>2</sub> offspring* \_\_\_\_\_

Are the deviations for the phenotypic ratio of the F<sub>2</sub> generation within the limits expected by chance?  
Calculate the Chi-square statistic for the F<sub>2</sub> generation in the chart below.

Observed Phenotypes (o)	Expected (e)	(o-e)	(o-e) <sup>2</sup>	$\frac{(o-e)^2}{e}$
			X <sup>2</sup> =	

Chi-square (X<sup>2</sup>) = \_\_\_\_\_

How many degrees of freedom are there? \_\_\_\_\_

Referring to the critical values chart, what is the probability (p) value for these data? \_\_\_\_\_

What is the significance? \_\_\_\_\_

According to the probability value, can you accept or reject your null hypothesis for this cross? Explain.

What are the genotypes of the  $P_1$  flies? FEMALE \_\_\_\_\_ MALE \_\_\_\_\_

What are the genotypes of the  $F_1$  flies? FEMALE \_\_\_\_\_ MALE \_\_\_\_\_

How is this trait inherited?

Is the mutation dominant or recessive? \_\_\_\_\_

Is the mutation autosomal or sex linked? \_\_\_\_\_

Is this  $F_1$  cross a monohybrid or dihybrid cross? \_\_\_\_\_

Make 2 Punnett squares showing parents and  $F_1$  and  $F_2$  offspring for this trait.

**Cross 3: Wild Type Female x Sepia Eyed, Vestigial Winged Male**

	F <sub>1</sub> Generation	F <sub>2</sub> Generation
Wild Type Males		
Wild Type Female		
Total Wild Types		
Vestigial Winged Males (normal eyes)		
Vestigial Winged Females (normal eyes)		
Total Vestigial Winged (normal antenna)		
Sepia eyed Males (normal wings)		
Sepia eyed Females (normal wings)		
Total Aristapedia (normal wings)		
Vestigial Wings, Sepia eyed Males		
Vestigial Wings, Sepia eyed Females		
Total Vestigial Wings, Sepia eyed		

Write a NULL hypothesis that describes the mode of inheritance for the trait(s) you studied. (See cross #1)

*I would expect this pattern in the F<sub>1</sub> offspring* \_\_\_\_\_

*I would expect this pattern in the F<sub>2</sub> offspring* \_\_\_\_\_

Are the deviations for the phenotypic ratio of the F<sub>2</sub> generation within the limits expected by chance?  
Calculate the Chi-square statistic for the F<sub>2</sub> generation in the chart below.

Observed Phenotypes (o)	Expected (e)	(o-e)	(o-e) <sup>2</sup>	$\frac{(o-e)^2}{e}$
			X <sup>2</sup> =	

Chi-square (X<sup>2</sup>) = \_\_\_\_\_ How many degrees of freedom are there? \_\_\_\_\_

Referring to the critical values chart, what is the probability (p) value for these data? \_\_\_\_\_

According to the probability value, can you accept or reject your null hypothesis? Explain.

What are the genotypes of the  $P_1$  flies? FEMALE \_\_\_\_\_ MALE \_\_\_\_\_

What are the genotypes of the  $F_1$  flies? FEMALE \_\_\_\_\_ MALE \_\_\_\_\_

How is this trait inherited?

Is the mutation dominant or recessive? \_\_\_\_\_

Is the mutation autosomal or sex linked? \_\_\_\_\_

Is this  $F_1$  cross a monohybrid or dihybrid cross? \_\_\_\_\_

Are these genes linked? \_\_\_\_\_

**Cross 4: Wild Type Female x Sepia Eyed, Ebony body Male**

	F <sub>1</sub> Generation	F <sub>2</sub> Generation
Wild Type Males		
Wild Type Female		
Total Wild Types		
Ebony body Males (normal eyes)		
Ebony body Females (normal eyes)		
Total Vestigial Winged (normal antenna)		
Sepia eyed Males (normal wings)		
Sepia eyed Females (normal wings)		
Total Aristapedia (normal wings)		
Ebony body Sepia eyed Males		
Ebony body, Sepia eyed Females		
Total Vestigial Wings, Sepia eyed		

Write a NULL hypothesis that describes the mode of inheritance for the trait(s) you studied. (See cross #1)

*I would expect this pattern in the F<sub>1</sub> offspring* \_\_\_\_\_

*I would expect this pattern in the F<sub>2</sub> offspring* \_\_\_\_\_

Are the deviations for the phenotypic ratio of the F<sub>2</sub> generation within the limits expected by chance?  
Calculate the Chi-square statistic for the F<sub>2</sub> generation in the chart below.

Observed Phenotypes (o)	Expected (e)	(o-e)	(o-e) <sup>2</sup>	$\frac{(o-e)^2}{e}$
			X <sup>2</sup> =	

Chi-square (X<sup>2</sup>) = \_\_\_\_\_ How many degrees of freedom are there? \_\_\_\_\_

Referring to the critical values chart, what is the probability (p) value for these data? \_\_\_\_\_

According to the probability value, can you accept or reject your null hypothesis? Explain.

How is this trait inherited?

Is the mutation dominant or recessive? \_\_\_\_\_

Is the mutation autosomal or sex linked? \_\_\_\_\_

Is this  $F_1$  cross a monohybrid or dihybrid cross? \_\_\_\_\_

Are these genes linked ? \_\_\_\_\_