	No	ime		
Lab 7 Genetics of Organisms- Virtual to Fly Genetics: <a href="http://www.sciencec">http://www.sciencec</a>	•	hila/		
	-	muz		
oss 1: Wild Type Female x Vestigial	Winged Male			
PHENOTYPE	F₁Generation	F <sub>2</sub> Gene	ration	
Wild Type Males				
Vestigial Winged Males				
Wild Type Females				
Vestigial Winged Females				
There is no difference between the  I would expect this pattern in the Fi	offspring	_ cross.		chance?
There is no difference between the  I would expect this pattern in the F  I would expect this pattern in the F  e the deviations for the phenotypic re answer this question, statistically and	offspring offspring itio of the F2 generation wit llyze the data using the Chi-	_ cross.  hin the limits square analysi	expected by	chance?
There is no difference between the  I would expect this pattern in the F  I would expect this pattern in the F  e the deviations for the phenotypic re answer this question, statistically and	offspring offspring itio of the F2 generation wit llyze the data using the Chi-	_ cross.  hin the limits square analysi	expected by	(o-e) <sup>2</sup>
There is no difference between the  I would expect this pattern in the F.  I would expect this pattern in the F.  the deviations for the phenotypic reanswer this question, statistically and culate the Chi-square statistic for the	offspring offspring utio of the F2 generation wit ulyze the data using the Chi- e F2 generation in the chart	hin the limits square analysi below.	expected by	
There is no difference between the  I would expect this pattern in the F.  I would expect this pattern in the F.  the deviations for the phenotypic reanswer this question, statistically and culate the Chi-square statistic for the	offspring offspring utio of the F2 generation wit ulyze the data using the Chi- e F2 generation in the chart	hin the limits square analysi below.	expected by	(o-e) <sup>2</sup>
There is no difference between the  I would expect this pattern in the F.  I would expect this pattern in the F.  the deviations for the phenotypic reanswer this question, statistically and culate the Chi-square statistic for the	offspring offspring utio of the F2 generation wit ulyze the data using the Chi- e F2 generation in the chart	hin the limits square analysi below.	expected by	(o-e) <sup>2</sup>
There is no difference between the  I would expect this pattern in the F.  I would expect this pattern in the F.  e the deviations for the phenotypic reanswer this question, statistically and lculate the Chi-square statistic for the	offspring offspring utio of the F2 generation wit ulyze the data using the Chi- e F2 generation in the chart	hin the limits square analysi below.	expected by	(o-e) <sup>2</sup>
I would expect this pattern in the Financial I would expect this question, statistically and local the Chi-square statistic for the I would be considered in the Chi-square statistic for the I would expect this pattern in the Financial I would expect the Financial I would expect this pattern in the Financial I would expect this pattern in the Financial I would expect this pattern	offspring offspring utio of the F2 generation wit ulyze the data using the Chi- e F2 generation in the chart	hin the limits square analysi below.	expected by	(o-e) <sup>2</sup>

What is the significance?

Remember:	The	minimu	ım v	ralue	for	rejec	ting	the	null	hypo	thesis	in	the	scier	ıces	is O	.05.	This	means	that	t only
5% of the	time	would	you	ехре	ct t	o see	simi	lar	data	if t	he null	l hy	poth	nesis	is co	orrec	t OR	? you	are 9	5% s	ure
the data de	oes n	ot fit	the	expe	ctec	l ratio	<b>)</b> .														

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	l?	

Make 2 Punnett squares showing parents and  $\mathsf{F}_1$  and  $\mathsf{F}_2$  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 F1 offspring $\_$	
E would expect this pattern in the F2 offspring	

Are the deviations for the phenotypic ratio of the  $F_2$  generation within the limits expected by chance? Calculate the Chi-square statistic for the  $F_2$  generation in the chart below.

Observed Phenotypes (o)	Expected (e)	(o-e)	(o-e) <sup>2</sup>	(0-e) <sup>2</sup>
			X <sup>2</sup> =	

Chi-square (X²) =
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 F1 flies?	FEMALE	MALE
How is this trait inherited?		
Is the mutation dominant or recessive	2?	
Is the mutation autosomal or sex link	ed?	
Is this $F_1$ cross a monohybrid or dihyb	orid cross?	

Make 2 Punnett squares showing parents and  $\mathsf{F}_1$  and  $\mathsf{F}_2$  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 (WT eyes)		
Vestigial Winged Females (WT eyes)		
Total Vestigial Winged ( WT eyes)		
Sepia eyed Males (WT wings)		
Sepia eyed Females (WT wings)		
Total Sepia eyes (WT 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	Write a NULI	L hypothesis that	describes	the mode of	inheritance for	the trait(s)	you studied.	(See cross #1)
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I would expect this pattern in the $F_1$ offspring	
I would expect this pattern in the F2 offspring	

Are the deviations for the phenotypic ratio of the  $F_2$  generation within the limits expected by chance? Calculate the Chi-square statistic for the  $F_2$  generation in the chart below.

Observed Phenotypes (o)	Expected (e)	(o-e)	(o-e) <sup>2</sup>	<u>(o-e)²</u> e
			X <sup>2</sup> =	

Chi-square (X2) =	How many degrees of freedom are there?
Referring to the critical values chart, what is the	he probability (p) value for these data?
According to the probability value, can you acce	ept or reject your null hypothesis? Explain.

What are the genotypes of the $P_1$ flies? FEN	IALE	MALE
What are the genotypes of the $F_1$ flies? FEM	MALE	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 o	ross?	<del></del>
Are these genes linked?		

Cross 4: DESIGN YOUR OWN CROSS (Cross with a WT)

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

	Males	ĺ					
	Wild Type Females						
	Females						
Write	a NULL hypothesis that describ	es the mode of	inheritance	for t	he trait(s) yo	ou studied.	(See cross #1)
I	would expect this pattern in the	F1 offspring					
Ιι	vould expect this pattern in the f	offspring _					
	he deviations for the phenotypic ate the Chi-square statistic for t		_			rpected by	chance?
	Observed Phenotypes (o	)	Expected	(e)	(o-e)	(o-e)²	<u>(o-e)²</u> e
						X <sup>2</sup> =	_
Chi-so	juare (X²) =	How t	many degree	es of f	reedom are		
Refer	ring to the critical values chart, v	what is the pro	bability (p)	value ·	for these da	ta?	
	ding to the probability value, can	·					
What	are the genotypes of the $P_1$ flies	? FEMALE_			MALE_		
What	are the genotypes of the F1 flies	? FEMALE_			MALE_		
How i	s this trait inherited?						
Is	the mutation dominant or recess	sive?					

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

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

EXTRA CREDIT LINKED CROSS: Heterozygous Sepia Eyed, Ebony body F1 Female X HOMOZYGOUS Male Make a cross between WT female with Sepia Eyed, Ebony body male to get F1 offspring Do a test cross between the F1 female and a HOMOZYGOUS Sepia Eyed, Ebony body male WATCH BOZEMAN BIOLOGY VIDEO- LINKED GENES to see how to do this

	F <sub>1</sub> Generation	F <sub>2</sub> Generation
Wild Type Males		
Wild Type Female		
Total Wild Types		
Ebony body Males (WT eyes)		
Ebony body Females (WTeyes)		
Total Ebony body (WT eyes)		
Sepia eyed Males (WT body)		
Sepia eyed Females (WT body)		
Total Sepia eyed (WT body)		
Ebony body Sepia eyed Males		
Ebony body, Sepia eyed Females		
Total Ebony body, Sepia eyed		

What is the map	distance between the	se genes?	
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EXTRA CREDIT LINKED CROSS: Heterozygous Sepia Eyed, Ebony body  $F_1$  Female X HOMOZYGOUS Male Make a cross between WT female with Sepia Eyed, Ebony body male to get  $F_1$  offspring Do a test cross between the  $F_1$  female and a HOMOZYGOUS Sepia Eyed, Ebony body male

## WATCH BOZEMAN BIOLOGY VIDEO- LINKED GENES to see how to do this

	F <sub>1</sub> Generation	F <sub>2</sub> Generation
Wild Type Males		
Wild Type Female		
Total Wild Types		
Ebony body Males (WT eyes)		
Ebony body Females (WTeyes)		
Total Ebony body (WT eyes)		
Sepia eyed Males (WT body)		
Sepia eyed Females (WT body)		
Total Sepia eyed (WT body)		
Ebony body Sepia eyed Males		
Ebony body, Sepia eyed Females		
Total Ebony body, Sepia eyed		

W/hat	t is the man	distance betw	ieen these oe	onoc?
'hat	t is the mab	distance betw	ieen these ae	гnе

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

Practice Cross: Wild Type Female x LOBE EYED Male

PHENOTYPE	F₁Generation	F <sub>2</sub> Generation
Wild Type Males		
Lobe eyed Males		
Wild Type Females		
Lobe eyed Females		

		cross.		
I would expect this pattern in the $F_1$ off:	spring			
I would expect this pattern in the F2 offs	pring	· · · · · · · · · · · · · · · · · · ·		
re the deviations for the phenotypic ratio of answer this question, statistically analyze alculate the $\it Chi$ -square statistic for the $\it F_2$	the data using the Chi-s	quare analysi	• •	chance?
Observed Phenotypes (o)	Expected (e)	(o-e)	(o-e) <sup>2</sup>	(0-e) <sup>2</sup>
			X <sup>2</sup> =	
hi-square (X²) =				
ow many degrees of freedom are there?				
ferring to the critical values chart, what is			-4-2	

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.

What are the construct of the D. fling?	EEM ALE	AA 41 E
What are the genotypes of the $P_1$ flies?		
What are the genotypes of the F <sub>1</sub> flies?	remale	MALE
How is this trait inherited?		
Is the mutation dominant or recessive	e?	
Is the mutation autosomal or sex link	ed?	
Is this $F_1$ cross a monohybrid or dihyl	brid cross?	
Make 2 Punnett squares showing parents	and $F_1$ and $F_2$ offspring for this tr	ait.

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

## PRACTICE CROSS 2: Wild Type Female x Ebony Body, Purple eyed male

	F1 Generation	F <sub>2</sub> Generation
Wild Type Males		
Wild Type Females		
Total Wild Types		

Ebony body Males (WT eyes)				
Ebony body Females (WT eyes)				
Total Ebony body (WT eyes)				
Purple eyed Males (WT body)				
Purple eyed Females (WT body)				
Total Purple eyes (WT wings)				
Ebony body, Purple eyed Males				
Ebony body, Purple eyed Females				
Total Ebony body, Purple eyed				
Total Epolly pody, Lai pio oyou				
Write a NULL hypothesis that describes the n	node of inneritance for	ine irali(s)	you studied	. (See cross #1
I would expect this pattern in the F1 offsp	oring			
I would expect this pattern in the F2 offsp	ring			
Are the deviations for the phenotypic ratio of Calculate the Chi-square statistic for the $F_2$ go	_		expected by	y chance?
Observed Phenotypes (o)	Expected (e)	(0-e)	(o-e) <sup>2</sup>	(0-e) <sup>2</sup>
			X <sup>2</sup> =	
Chi-square (X2) =	How many degrees of	freedom are	e there?	
Referring to the critical values chart, what is	the probability (p) value	for these d	lata?	
According to the probability value, can you acc	ept or reject your null h	nypothesis?	Explain.	
What are the genotypes of the $P_1$ flies? FEN	NALE	MALE	i	
What are the genotypes of the F1 flies? FEM	MALE	MALE	Ē	

Is the mutation dominant or recessive?	
Is the mutation autosomal or sex linked?	
Is this F1 cross a monohybrid or dihybrid cross?	
Are these genes linked?	

How is this trait inherited?