

## Fruit Fly Genetics

**Purpose:** Determine one autosomal and one sex-linked trait in fruit flies.

**Background information:** In order to make predictions in this lab *and write a good conclusion*, you need to have an understanding of autosomal and sex-linked traits. Write down 1-2 sentences of background information that explains these concepts. When in the computer lab, you may also want to look up common fruit fly traits to see which are autosomal or sex-linked. **Be sure to write down the source of your information.**

### **Hypothesis:**

You will have two different hypotheses. Write one for a trait you think is autosomal and one for a trait you think is sex-linked. Remember to phrase it as an if-then statement.

*Ex: **If white eyes are sex-linked, then a cross between a white-eyed female and a wild-type male will produce 50% wild-type females and 50% white-eyed males.***

**Materials:** Virtual fly lab, lab notebook, brain :)

**Procedure:**

1. Go to <http://www.sciencecourseware.com/vcise/drosophila/>
2. Register using the class code 10867291.
3. Order flies (in your procedure, be specific about the sex and phenotypes of the flies).
4. Mate flies & view results under microscope.
5. Record data and compare to your predicted Punnett Squares for this cross. Label by generation ( $F_1$ ,  $F_2$ ).
6. Draw a Punnett Square to predict results of a cross between flies from the  $F_1$  generation. Then perform this cross and record results.
7. Repeat steps 3-6 with your other trait.

**How do I know what trait to use?**

Just try it! Make Punnett squares for each cross you try. Compare your results (percentages) to the anticipated probabilities from your Punnett Square. If you're stuck, search the internet to see if you can determine the inheritance pattern.

**What if the percentages don't match my Punnett Square?**

Maybe the trait is sex-linked but you didn't use X,Y in the square. Or it was autosomal and you *did* use X,Y. Try it both ways!

## Fruit Fly Lab Instructions

**Conclusion:** In your conclusion you should...

1. State whether your hypothesis was supported or rejected.
2. Explain *how* you know if your hypothesis is supported or rejected (report actual data= percentages).
3. Do this for BOTH hypotheses.

Example: The hypothesis that bar eyes is an autosomal trait was rejected. Bar eyes is a sex-linked trait because the offspring of a cross between a bar-eyed female and wild type male resulted in ~49% bar-eyed offspring, all of which were male. If the trait was autosomal, there would be an equal chance of males and females inheriting the trait. Sex-linked traits affect males more than females.