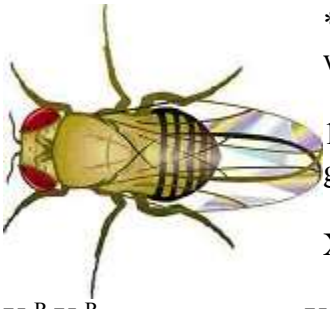
Name: _____ Class: _____ Date: _____

Genetics - X Linked Genes



In fruit flies, eye color is a sex linked trait. Red is dominant to white.

1. What are the sexes and eye colors of flies with the following genotypes?

$X^R X^r$ _____ $X^R Y$ _____ $X^r X^r$ _____

$X^R X^R$ _____ $X^r Y$ _____

2. What are the genotypes of these flies:

white eyed, male _____ red eyed female (heterozygous) _____

white eyed, female _____ red eyed, male _____

3. Show the cross of a white eyed female $X^r X^r$ with a red-eyed male $X^R Y$.

4. Show a cross between a pure red eyed female and a white eyed male.
What are the genotypes of the parents:

_____ and _____

How many are:

white eyed, male ____
white eyed, female ____
red eyed, male ____
red eyed, female ____

5. Show the cross of a red eyed female (heterozygous) and a red eyed male.

What are the genotypes of the parents?

_____ & _____

How many are:

white eyed, male ____
white eyed, female ____
red eyed, male ____
red eyed, female ____

Math: What if in the above cross, 100 males were produced and 200 females. How many total red-eyed flies would there be? _____

Human Sex Linkage

6. In humans, hemophilia is a sex linked trait. Females can be normal, carriers, or have the disease. Males will either have the disease or not (but they won't ever be carriers)

$X^H X^H$ = female, normal	$X^H Y$ = male, normal
$X^H X^h$ = female, carrier	
$X^h X^h$ = female, hemophiliac	$X^h Y$= male, hemophiliac

Show the cross of a man who has hemophilia with a woman who is a carrier.

What is the probability that their children will have the disease? _____

7. A woman who is a carrier marries a normal man. Show the cross. What is the probability that their children will have hemophilia? What sex will a child in the family with hemophilia be?

8. A woman who has hemophilia marries a normal man. How many of their children will have hemophilia, and what is their sex?

Calico Cat Genetics

9. In cats, the gene for calico (multicolored) cats is codominant. Females that receive a **B** and an **R** gene have black and o**R**ange splotches on white coats. Males can only be black or orange, but never calico.

Here's what a calico female's genotype would look like: $X^B X^R$

Show the cross of a female calico cat with a black male?

What percentage of the kittens will be black and male? _____
What percentage of the kittens will be calico and male? _____
What percentage of the kittens will be calico and female? _____

10. Show the cross of a female black cat, with a male orange cat.

What percentage of the kittens will be calico and female? _____What color will all the male cats be? _____