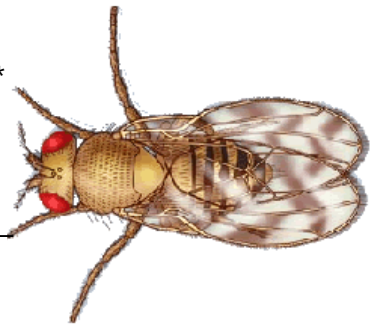
Name _____

Practice Problems: Sex 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:

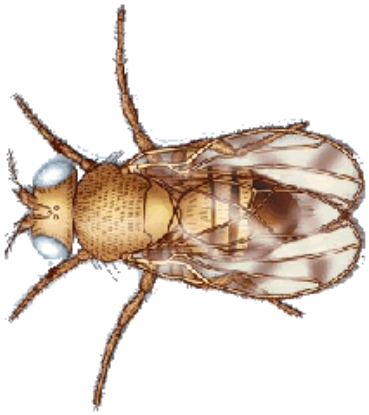
$X^R X^r$ _____ $X^R Y$ _____ $X^r X^r$ _____
$X^R X^R$ _____ $X^r Y$ _____

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 $X^R Y$.

How many are:
white eyed, male ____
white eyed, female ____
red eyed, male ____
red eyed, female ____



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

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

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

$X^H X^h$ = female, carrier

$X^h X^h$ = female, hemophiliac

$X^H Y$ = male, normal

$X^h Y$ = male, hemophiliac

6. Show the cross of a man who has hemophilia with a woman who is normal (not a carrier).

How many children will have the disease? _____

7. A woman who is a carrier marries a normal man. Show the cross:

How many children will have the disease? _____

What is the sex of the child with the disease? _____

8. A woman who has hemophilia marries a normal man.

How many children will have the disease? _____

What is the sex of the child with the disease? _____

9. In cats, the gene for calico (multicolored) cats is codominant. Females that receive a B and an R gene have black and oRange splotches on white coats. Males can only be black or orange, but rarely calico. Show the cross of a female calico cat with a black male;

Female, calico = $X^B X^R$ Male, black = $X^B Y$

How many offspring will be:

Female and calico ____ Female and black ____
Male and black ___ Male and orange ___
Male and calico ____

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

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