Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**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 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:

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_& \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 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 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Math: What if in the above cross, 100 males were produced and 200 females.

How many total red-eyed flies would there be?

 \_\_\_\_\_\_\_\_\_\_\_\_

 red eyed, male \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ red eyed, female \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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)

|  |  |
| --- | --- |
|  = female, normal= female, carrier = female, hemophiliac | = male, normal= 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?

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 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? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_