

GENETICS: X LINKED GENES

Name Keyy

****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:

$X^R X^R$ Female Red
 $X^R X^r$ Female Red
 $X^r X^r$ Female White
 $X^R Y$ Male Red
 $X^r Y$ Male White

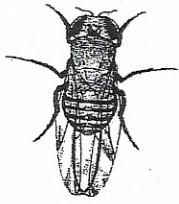
2. What are the genotypes of these flies:

white eyed, male $X^r Y$
 white eyed, female $X^r X^r$
 red eyed female (heterozygous) $X^R X^r$
 red eyed, male $X^R Y$

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

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

white eyed female & red eyed male



How many are:

white eyed, male 0
 white eyed, female 2
 red eyed, male 2
 red eyed, female 0

5. Show the cross of a red eyed female (heterozygous) and a red eyed male. What are the genotypes of the parents?

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

How many are:
 white eyed, male 0
 white eyed, female 0
 red eyed, male 2
 red eyed, female 2

6. In humans, hemophilia is a sex linked trait. Females with the disease or not (but they won't ever be carriers)

What: What if in the above cross, 100 males were produced and 200 females? How many total red-eyed flies would there be?
250

50 Red male
 50 Red female

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

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

X^H	X^h	X^H	Y
X^H	$X^H X^h$	$X^H X^h$	$X^H Y$
X^h	$X^h X^h$	$X^h X^h$	$X^h Y$

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?
 hemophilia = 25%, male

8. A woman who has hemophilia marries a normal man. How many of their children will have hemophilia, and what is their sex?
 50% hemophilia male

X^H	X^h	X^H	Y
X^H	$X^H X^h$	$X^H X^h$	$X^H Y$
X^h	$X^h X^h$	$X^h X^h$	$X^h Y$

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

X^B	X^R	X^B	Y
X^B	$X^B X^R$	$X^B X^R$	$X^B Y$
X^R	$X^B X^R$	$X^R X^R$	$X^R Y$

What percentage of the kittens will be black and male? 25%
 What percentage of the kittens will be calico and male? 0%
 What percentage of the kittens will be calico and female? 25%

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

X^B	X^R	X^B	Y
X^B	$X^B X^R$	$X^B X^R$	$X^B Y$
X^R	$X^B X^R$	$X^R X^R$	$X^R Y$

What percentage of the kittens will be calico and female? 50%
 What color will all the male cats be? black