

### Sex-linked Traits Worksheet

1. Which sex is more likely have a recessive, sex-linked trait?                      Male                      Female
2. Which parent do sons inherit recessive, sex-linked traits from?                      Mother                      Father
3. Which type of sex chromosome do you find most sex-linked traits on?                      X                      Y
4. Colorblindness is a recessive, sex-linked disorder in humans. A colorblind man has a child with a woman who is a carrier of the disorder.

KEY:  $X^N$  = normal vision     $X^n$  = colorblindness

- a. What is the genotype of the man? \_\_\_\_\_
- b. What is the genotype of the woman? \_\_\_\_\_
- c. Fill in the Punnett Square to the right.
- d. What is the chance that the *child* will be colorblind? \_\_\_\_\_
- e. What is the chance that a *daughter* will be colorblind? \_\_\_\_\_
- f. What is the chance that a *son* will be colorblind? \_\_\_\_\_

5. In fruit flies, red eyes are dominant over white eyes. Eye color is a sex-linked trait. A red-eyed male mates with a white-eyed female.

- a. Make a key with eye color in fruit flies.

$X^R$  = \_\_\_\_\_                       $X^r$  = \_\_\_\_\_

- b. What is the genotype of the male? \_\_\_\_\_
- c. What is the genotype of the female? \_\_\_\_\_
- d. Fill in the Punnett Square to the right.
- e. What is the chance that there will be an *offspring* with white eyes? \_\_\_\_\_

6. Hemophilia is a disease caused by a gene found on the X chromosome. Therefore, it is referred to as a sex-linked disease. The recessive allele causes the disease. A man with hemophilia marries a woman that is homozygous dominant for the trait.

a. Make a key for the trait.

$X^N =$  \_\_\_\_\_  $X^n =$  \_\_\_\_\_

b. What is the genotype of the male? \_\_\_\_\_

c. What is the genotype of the female? \_\_\_\_\_

d. Fill in the Punnett Square to the right.

e. Will any of their offspring have the disease?

**Important Background Information for Question #7: (This is a challenge!)**

*In fruit flies, humans and other mammals, sex is determined by an X-Y system. However, many organisms do not have the X-Y system of sex determination. For example, birds have a Z-W system. Male birds are ZZ, where as females are ZW.*

7. In chickens, barred feathers ( $Z^B$ ) are dominant over nonbarred feathers ( $Z^b$ ).

a. Draw a Punnett square that shows the results of a cross between a barred female and a nonbarred male.

b. What is the probability that the offspring will be:

i. Barred females? \_\_\_\_\_

ii. Nonbarred females? \_\_\_\_\_

iii. Barred males? \_\_\_\_\_

iv. Nonbarred males? \_\_\_\_\_

