

Name: Anne Surkey Date: _____ Block: _____

Sex-linked Traits Worksheet

- Which sex is more likely have a recessive, sex-linked trait? Male Female
- Which parent do sons inherit recessive, sex-linked traits from? Mother Father
- Which type of sex chromosome do you find most sex-linked traits on? X Y
Remember trait carried on the X and male get X from mom
- 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? $X^n Y$

b. What is the genotype of the woman? $X^N X^n$

c. Fill in the Punnett Square to the right.

	X^N	X^n	Y
X^N	$X^N X^N$	$X^N X^n$	$X^N Y$
X^n	$X^N X^n$	$X^n X^n$	$X^n Y$

- What is the chance that the child will be colorblind? 50%
- What is the chance that a daughter will be colorblind? 50%
- What is the chance that a son will be colorblind? 50%

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 = red

X^r = white

b. What is the genotype of the male? $X^R Y$

c. What is the genotype of the female? $X^r X^r$

d. Fill in the Punnett Square to the right.

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

- What is the chance that there will be an offspring with white eyes? 50%

a trait that can be found on any chromosome (1-22) EXCEPT the sex chromosomes

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Date: _____ Period: _____

Sex-Linked Traits Worksheet

1) Albinism is a recessive autosomal genetic disorder that causes the complete or partial absence of pigments in the skin, hair and eyes. Fill in the Punnett square and determine the expected genotypic ratios from crossing homozygous recessive and heterozygous dominant parents.

R	r
Rr	rr
Rr	rr

Genotypes: $Rr \times rr$ Genotypic Ratio: $Rr = 50\%$
 Phenotypes: $50\% \rightarrow$ No albinism 50% albinism
 % of kids with disorder: 50% % of carrier kids: 50%

2) Red-Green color blindness is a recessive sex-linked (X chromosome) genetic disorder where the middle (green) or long (red-yellow) wavelength cones in the eyes have a partial or complete loss of function. Fill in the Punnett square and determine the expected genotypes and phenotypes from crossing a normal male and a female who is a carrier for color blindness.

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

Genotypes: $X^H X^h \times X^H Y$
 Circle all phenotype(s): normal male, male with color blindness, normal female, carrier female, female with color blindness
 % of kids with disorder: 25% Circle their gender(s) male / female

3) Color blindness is a recessive sex-linked genetic disorder located on the X chromosome. Fill in the Punnett square for a cross of a male with color blindness and a normal female.

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

Genotypes: $X^H X^H \times X^h Y$
 Circle all phenotype(s): normal male, male with color blindness, normal female, carrier female, female with color blindness
 % of kids with disorder: 0% Circle their gender(s) male / female

4) Color blindness is a recessive sex-linked genetic disorder located on the X chromosome. Fill in the Punnett square for a cross of a male who is color blind and a female who is a carrier for color blindness.

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

Genotypes: $X^H X^h \times X^h Y$
 Circle all phenotype(s): normal male, male with color blindness, normal female, carrier female, female with color blindness
 % of kids with disorder: 50% Circle their gender(s) male / female

oops!

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5) Color blindness is a recessive sex-linked genetic disorder located on the X chromosome. Fill in the Punnett square for a cross of a normal male and a female who is color blind.

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

Genotypes: $X^H X^h \times X^h Y$
 Circle all phenotype(s): normal male, male with color blindness, normal female, carrier female, female with color blindness
 % of kids with disorder: 50% Circle their gender(s) male / female

6) Color blindness is a recessive sex-linked genetic disorder located on the X chromosome. Fill in the Punnett square for a cross of a color blind male and a color blind female.

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

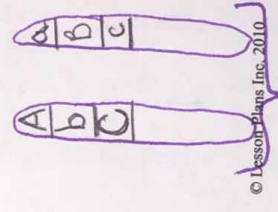
Genotypes: $X^h X^h \times X^h Y$
 Circle all phenotype(s): normal male, male with color blindness, normal female, carrier female, female with color blindness
 % of kids with disorder: 100% Circle their gender(s) male / female

7) Explain how sex-linked traits are different than autosomal traits.

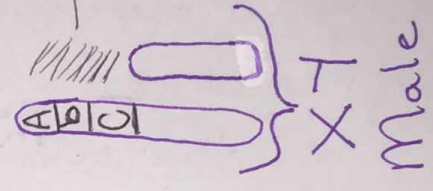
Autosomal can be on any chromosome EXCEPT sex chromosomes. Sex-linked traits are on the sex chromosomes. Explain why males have more sex-linked disorders than females.

Because the X chromosome is longer than the Y chromosome * only trait can show will be on the X.

Nothing here to 'block' seeing trait



X X Female



X Y Male

2 X chromosomes so it's like they can 'battle' to determine what trait will be seen.

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