

Monohybrid Cross Worksheet 7: Sex-Linked Inheritance

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Name

Date

Monohybrid cross problems

1. Hemophilia, a rare condition in humans in which blood is incapable of clotting due to inefficient amounts of clotting factors, is caused by a sex-linked, recessive gene mutation (f) in the *FIX* gene.

a. Is the mutation found on X or Y chromosomes? Why? _____

2. Determine if the following genotypes are unaffected (U), directly affected (A), and/or a carrier (C):

i. X^fX _____

ii. $X Y$ _____

iii. $X^f X^f$ _____

iv. $X^f Y$ _____

v. $X X$ _____

vi. $X X^f$ _____

3. Are males or females more prone to being affected by hemophilia? Why?

4. A male with hemophilia has a child with a female that is a carrier of the hemophilia mutation. Fill out the monohybrid cross and determine the following:

a. P1 genotypes: _____

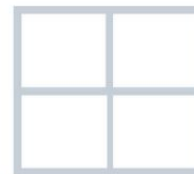
b. F1 genotypes: _____

c. Can the couple have a male child that is unaffected? _____

d. What proportion of F1 children are unaffected? _____

e. What proportion of F1 children are carriers? _____

f. What proportion of F1 children are affected? _____



5. Two parents unaffected by hemophilia have a child who is diagnosed with hemophilia caused by a mutation in the *FIX* gene. How is this possible? _____

6. An unaffected male and female carrier of the *FIX* mutation have children. Fill out the monohybrid cross and determine the following:

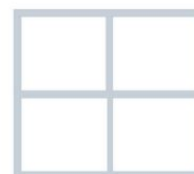
a. P1 genotypes: _____

b. F1 genotypes: _____

c. What proportion of children have hemophilia? _____

d. What proportion of children are carriers? _____

e. What proportion of children are unaffected? _____



7. If the mutation carrier(s) from Question 6 have children with an unaffected partner, fill out the monohybrid cross and determine the following:

a. P1: _____

b. F1 genotypes: _____

c. What proportion of F1 have hemophilia? _____

d. What proportion of F1 are carriers? _____

