

1. Hemophilia, a blood clotting disorder, is caused by an X-linked recessive allele (h). What are the chances that the daughter of a normal man and a heterozygous woman will have hemophilia?

a. Write the allele symbols and indicate what trait they code for.

$X^H = \text{normal}$ $X^h = \text{hemophilia}$

b. Write the P₁ cross.

$X^N Y \times X^N X^n$

c. Write the Punnett square.

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

d. Answer to the question:

0% chance of ♀ offspring w/ hemophil.

2. A recessive allele on the X chromosome causes colorblindness. A woman with normal vision (whose father is colorblind) marries a colorblind man. What fraction of their children is expected to be colorblind boys? Show your work and circle your answer below.

1. normal = X^N colorblind = X^n

2. $X^N X^n \times X^n Y$

3.

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

4. $\frac{1}{4}$

3. For a species of squash, assume white color is dominant to yellow color, and disk shape is dominant to spherical shape. If a squash plant that is heterozygous for white, disk squash ($WwDd$) is crossed with a plant that is also heterozygous for white and disk, how many different **phenotypes** are their offspring expected to show?

dihybrid cross

a. Use the **FOIL** method to show the different possible gametes that each parent can produce.



1. WD
2. Wd
3. wD
4. wd

b. Make a Punnett square showing the possible genotypes of offspring of this 2-factor cross.

	WD	Wd	wD	wd
WD	$WWDD$	$WWdD$	$WwDD$	$WwDd$
Wd	$WWdD$	$WWdd$	$WwDd$	$Wwdd$
wD	$WwDD$	$WwDd$	$wwDD$	$wwDd$
wd	$WwDd$	$Wwdd$	$wwDd$	$wwdd$

phenotypes:

- white, disk: 9
- white, sphere: 3
- yellow, disk: 3
- yellow, sphere: 1