	A	A
A	AA	AA
A	AA	AA

$\frac{4}{4}$ = AA

	a	a
a	aa	aa
a	aa	aa

$\frac{4}{4}$ = aa

	a	a
A	Aa	Aa
A	Aa	Aa

$\frac{4}{4}$ = Aa

	A	a
A	AA	Aa
A	AA	Aa

$\frac{2}{4}$ AA

$\frac{2}{4}$ Aa

	A	a
a	Aa	aa
a	Aa	aa

$\frac{2}{4}$ Aa

$\frac{2}{4}$ aa

	A	a
A	AA	Aa
a	Aa	aa

$\frac{1}{4}$ AA

$\frac{2}{4}$ Aa

$\frac{1}{4}$ aa

1. Dimples (D), tongue rolling (R) and freckles (F) are all dominant traits carried by autosomes.

a. What is the genotype of a person who is heterozygous for dimples and tongue rolling and who has freckles?

Dd Rr FF or Ff

b. When this person produces gametes, what possible combinations of alleles might they carry? List ALL possibilities.

DRF
DrF
dRF
drF

DRf   dRf
Drf   drf

2. An albino man, whose parents are both normally pigmented, marries a normally pigmented woman. They have one child, an albino daughter. List the genotypes of all the persons mentioned.

Genotype of the man __aa__

Genotype of his parents __Aa__

Genotype of the woman __Aa__

Genotype of the child __aa__

Could this couple produce normally pigmented offspring?

__Yes__ Why or why not? Mom can distribute A to her children

3. Huntington's Disease is a degenerative brain disorder caused by an autosomal dominant allele (H). The disease begins to manifest itself early in middle age, often after the individual has already produced children. As the disease progresses the individual loses control over movement, speech, reason and thinking. There is no effective treatment of cure and eventually full-time care is required.

Suppose a woman who has no history of Huntington's Disease marries a man whose father died of Huntington's disease, but whose mother is disease free. They produce one child. By the time the child is 18 the father has begun to show early signs of the disease. The family is devastated. What is the probability that the child will be stricken with the disease?

Woman h h
man H h
man's father H h
man's mother h h
child ___ ___ 50% (2/4)

	H	h
h	Hh	hh
h	Hh	hh

4. It happens that the length of the big toe is determined by a single gene pair and that big toes equal to or longer than the second toes is the recessive condition (t). Presuming that your big toes are longer than your second toes and your fiancé also has long big toes, what are the chances that your offspring will have short big toes (big toes shorter than the second toes)?

 = tt

Your = tt
fiancé = tt

	t	t
t	tt	tt
t	tt	tt

∅ %

X -

- 5. Will a man inherit a sex-linked trait from his mother or his father? Why?

he can only inherit X from mother + these traits are carried on the X chromosome.

"X"

6. Color-blindness is a sex-linked inherited trait. A man with normal vision marries a woman with normal vision but whose father was colorblind.

a. What percentage of their sons are likely to be colorblind?

$\frac{1}{2}$ 50%

b. What percentage of their daughters are likely to by colorblind?

0% 0/2

c. Who will be carriers of the colorblind allele, sons or daughters (a carrier is the heterozygous form of the genotype)? Daughters

man $X^B Y$

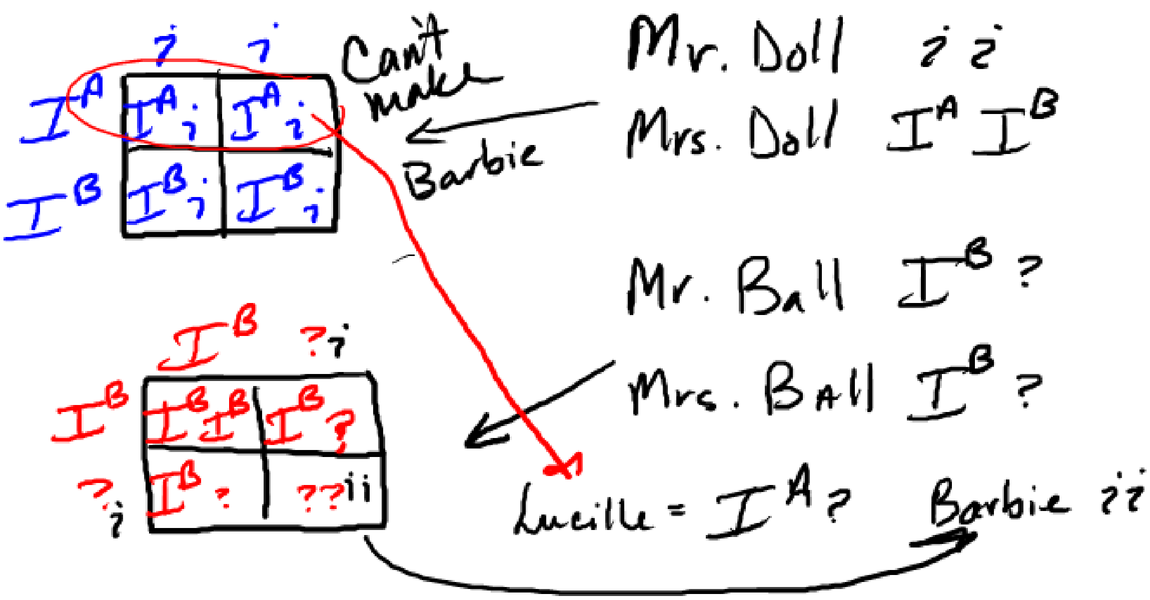
woman $X^B X^b$

father $X^b Y$

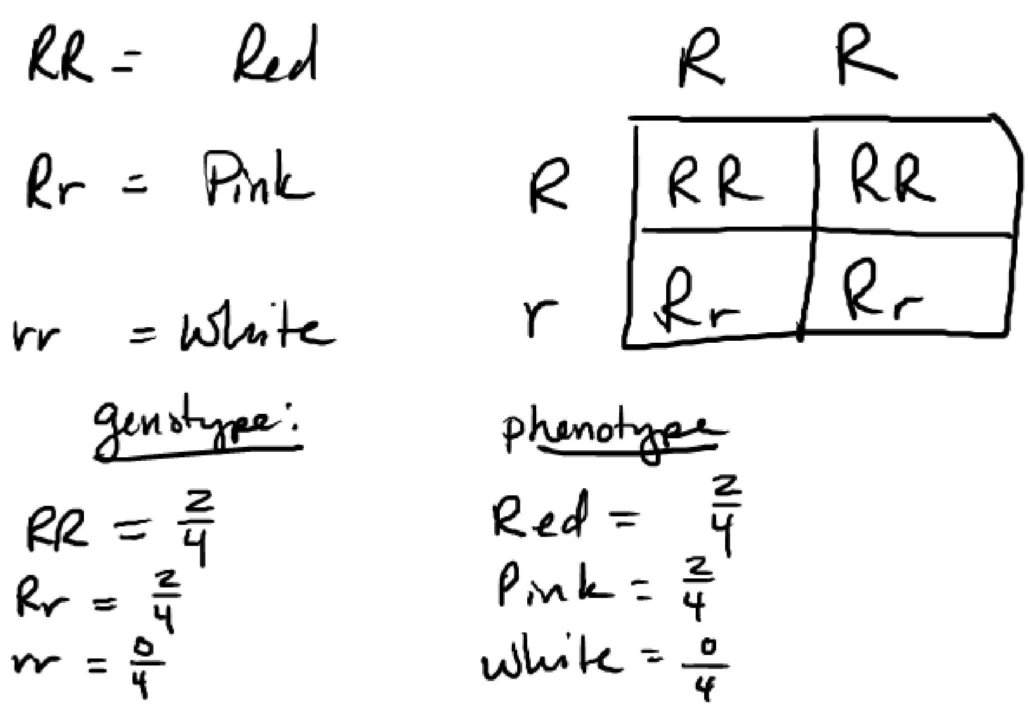
	X^B	Y
X^B	$X^B X^B$	$X^B Y$
X^b	$X^B X^b$	$X^b Y$

7. Mrs. Ball and Mrs. Doll had babies at the same hospital at the same time. Mrs. Ball took home a girl and named her Lucille. Mrs. Doll took home a girl and named her Barbie. However, Mrs. Doll was sure that the red-haired baby she brought home was not hers and requested that the hospital do a blood test to make sure the babies had not been switched. Blood tests showed that Mr. Doll was blood type O and Mrs. Doll was blood type AB. Mr. and Mrs. Ball were both type B. Lucille was type A and Barbie was type O. Had a switch occurred? How do you know?

Yes!



8. What would be the genotype and phenotype ratios of a cross between a plant that is homozygous dominant for red flowers and a plant that is heterozygous for the trait?



- Are traits always associated with dominant alleles?

NO!

ex. Huntington's = Dominant

Albino = recessive

- Do dominant or recessive phenotypes have any relationship to superiority or inferiority?

NO!

Huntington's

HH = dead

Albino

aa = no pigment

- What determines if an allele is *good* or *bad*?

The environment!

Thank you Darwin :)

- Ultimately, what creates changes in the alleles causing them to become different from one another?

Mutation

One More…..

If a man has a genotype of DDCcAa and he has offspring with a woman that is ddCcAa, what is the probability that they will have a child that is DdCCaa? $\frac{4}{4} \times \frac{1}{4} \times \frac{1}{4} = \frac{4}{64} = \frac{1}{16}$