

Practice Problems: Dihybrid Cross

Background Information:

<u>Trait</u>	<u>Dominant</u>	<u>Recessive</u>
Plant Height	Tall (T)	Short (t)
Pod Shape	Smooth (S)	Wrinkled (s)
Pod Color	Yellow (Y)	Green (y)
Seed Coat	Gray (G)	White (g)

- Write down the phenotypes for each of the following genotypes.
 - SS _____
 - Yy _____
 - Gg _____
 - Tt _____
 - TtGg _____
 - SSyy _____
 - yyTT _____
- Write down the possible genotypes for each of the possible phenotypes.
 - Smooth pods _____
 - Green pods _____
 - Tall plants _____
 - Tall plant and Green pods _____
 - Wrinkled and short _____
 - Gray seeds and smooth pods _____
- Use a punnett square to complete the following cross. YyTt and yyTt . What are the genotype and phenotype ratios?

4. Use a punnett square to complete the following cross. Heterozygous smooth/Gray seed coat and a Homozygous Wrinkled/White seed coat. What are the genotype and phenotype ratios?

5. Use a punnett square to complete the following cross. TTGg and TtGg. What are the genotype and phenotype ratios?

6. Cross two heterozygous smooth pod and grey seeded plants.

If Mendel wanted to determine the genotype of a yellow round pea, what would be the best plant to cross it?

- a. GgWw b. GGWw c. ggWW d. GGww e. ggww

Which of the following genotypes would you **not expect** to find among the offspring of a SsYy x ssyy test cross:

- A. ssyy B. SsYy C. Ssyy D. ssYy E. SsYY

In hamsters, rough coat (R) is dominant over smooth coat (r) and brown coat (B) is dominant over white coat(b). If you cross a homozygous rough, homozygous brown guinea pig with a smooth white one:

- a. What will be the genotypes of the parents? _____
- b. What is the phenotype ratio of the children? _____

Let's let **R** represent tongue-rolling, **r** represent a non-roller, **T** represent ability to taste PTC, and **t** represent non-tasting. Suppose a woman who is both a heterozygous tongue-roller and a non-PTC-taster marries a man who is a heterozygous tongue-roller and is a homozygous PTC taster. What will their children's phenotypes ratio be?

Wolves are sometimes observed to have black coats and blue eyes. Assume that these traits are controlled by single locus genes and are located on different chromosomes. Assume further that normal coat color (N) is dominant to black (n) and brown eyes (B) are dominant to blue (b). Suppose the alpha male and alpha female of a pack (these are the dominant individuals who do most of the breeding) are black with blue eyes and normal colored with brown eyes, respectively. The female is also heterozygous for both traits. What is the phenotype ratio of the offspring?