

Biology

Name: _____

Basic Genetics - Monohybrids & Dihybrids

Date: _____

Hour: _____

Must show all work to receive credit

1. A pea plant is the F1 offspring of a true-breeding (homozygous) plant with purple flowers and a true-breeding (homozygous) plant with white flowers. This plant is crossed with one that has white flowers. Purple is dominant (P) to white (p). How many of the plants in the F2 generation will have white flowers?

2. In humans, tongue rolling is a dominant trait (T). Those with the recessive (t) condition cannot roll their tongues. Bob can roll his tongue, but his mother could not. He is married to Sally, who cannot roll her tongue. What is the probability that their first born child will not be able to roll his tongue?

3. In goats, a recessive (f) gene causes the goats to “faint” when they are startled. A farmer breeds two goats (that have never fainted) and their first offspring faints two days after birth. What must the parent’s genotypes have been?

4. In guinea pigs, short hair (S) is dominant to long hair (s). Also in guinea pigs, black eyes (B) are dominant to red eyes (b). A male guinea pig that is heterozygous for both traits is crossed with a female that is long haired and red eyed. What are the expected phenotypes of their offspring and in what proportion? (This means a dihybrid cross!)

5. In horses, trotter (T) is dominant over pacer (t). Straight manes (H) are dominant over curly manes (h). Gives the genotypes and phenotypes of every possible combination in a horse.

6. A curly maned pacer horse is mated to one who is homozygous dominant for both traits. What would you expect their offspring to look like?

7. If you have two horses that are both heterozygous for both traits - trotting and mane - what ratio of the offspring would you expect to be curly maned and a pacer?

8. In pea plants, purple flowers (P) are dominant to white flowers (p). Rounds seeds (R) are dominant to wrinkled seeds (r) .

a. Pprr x ppRr How many offspring are purple with wrinkled seeds? _____

b. ppRR x Pprr How many offspring are purple with round seeds? _____

c. pprr x PpRr How many offspring are white with wrinkled seeds? _____