

Monohybridism

1. A heterozygous round seeded plant (Rr) is crossed with a homozygous round seeded plant (RR).

What percentage of the offspring will be homozygous (RR)? _____

2. A homozygous round seeded plant is crossed with a homozygous wrinkled seeded plant. What are the genotypes of the parents? _____ x _____

What percentage of the offspring will also be homozygous? _____

3. In pea plants purple flowers are dominant to white flowers.

If two white flowered plants are cross, what percentage of their offspring will be white flowered? _____

4. A white flowered plant is crossed with a plant that is heterozygous for the trait.

What percentage of the offspring will have purple flowers? _____

5. Two plants, both heterozygous for the gene that controls flower colour are crossed. What percentage of their offspring will have purple flowers?

What percentage will have white flowers? _____

6. In guinea pigs, the allele for short hair is dominant.

What genotype would a heterozygous short haired guinea pig have? _____

What genotype would a pure breeding short haired guinea pig have? _____

What genotype would a long haired guinea pig have? _____

7. Show the cross for a pure breeding short haired guinea pig and a long haired guinea pig.

What percentage of the offspring will have short hair? _____

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8. Show the cross for two heterozygous guinea pigs.

What percentage of the offspring will have short hair? _____

What percentage of the offspring will have long hair? _____

9. Two short haired guinea pigs are mated several times. Out of 100 offspring, 25 of them have long hair. What are the probable genotypes of the parents?

_____ x _____ Show the cross to prove it!

10. In dogs, black body hair dominates over golden body hair. If two parent black dogs had just one golden hair puppy, what would the genotype of the parents be?

_____ x _____

11. Both parents of a blue-eyed man are brown-eyed (Brown is dominant). This man marries a brown-eyed woman who had a brown-eyed mother, blue-eyed father, and a brown-eyed brother. The man and woman in this question have a brown-eyed child. Answer the following

Provide the genotypes

- a. the man _____
- b. man's mother _____
- c. man's father _____
- d. the woman _____
- e. woman's mother _____
- f. woman's father _____

12. In fruit flies (*Drosophila*) gray body dominates over black body. Consider the cross between a hybrid gray fly and a black fly. (Use "G" and "g" alleles) GAMETES = "sex cells (sperm or egg)"

- a. Gametes of gray fly _____ & _____
- b. Gametes of black fly _____ & _____
- c. List all possible offspring genotypes _____

13. In horses, the trotting gait is due to a dominant allele "T" and the pacing gait to a recessive allele "t". If both parents are trotters and their first foal (offspring) is a pacer...

- a. What are the parents genotype _____ X _____
- b. If the parents have another foal, what is the probability that this foal will be a trotter? _____
- c. Chances of having two pacers in a row? _____

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14. In a certain plant, yellow fruit, Y, is dominant to white fruit, y. A heterozygous plant with yellow fruit is crossed with a plant with white fruit. Determine the probable genotypic and phenotypic ratios resulting from this cross.

15. Determine the probable genotypic and phenotypic ratios expected from crossing two heterozygous plants of previous problem.

16. In cats the allele for short hair is dominant over the allele for long hair. A short haired male and long haired female have kittens. Eight kittens have short hair and 3 have long hair.

- a. What are genotypes of the parents?
- b. What is the expected ratio of short to long haired cats?
- c. What is - the actual ratio in this problem?

17. A man and his wife are both heterozygous for brown eyes. They have six children all of whom have blue eyes.

- a. How is this explained?
- b. What are the chances that their next child will have brown eyes?
- c. What are the chances that their next child will have blue eyes?

18. In humans, the phenotype "white forelock" (a patch of unpigmented hair on the front of the head) is dominant. A woman with a white forelock married a man with white forelock. They had two daughters...one with a white forelock and one without.

- a. Genotype of parents _____ X _____
- b. Give the gamete genotype of the father's sperm _____
- c. Give the gamete genotype of the mother's egg _____
- d. Chance that the next child born to this family has white forelock? _____
- e. Chances the child is born without white forelock _____