

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

Biology Honors  
Sample Genetics Quiz

1. In one experiment, Mendel crossed a pea plant that bred true for green pods with a pea plant that bred true for yellow pods. All the F<sub>1</sub> plants had green pods. Which is the recessive trait? Explain your answer.

Recessive trait is \_\_\_\_\_

2. What are the genotype and phenotype ratios that result from the cross of two pea plants heterozygous for green pods? Use a Punnett square to demonstrate your answer

Genotype ratio: \_\_\_\_\_

Phenotype ratio: \_\_\_\_\_

3. Tall is a dominant allele in pea plants (**T**). If two tall plants are crossed, some of the offspring are short. What are the possible genotypes of the parents?

Possible genotypes \_\_\_\_\_

4. In carnations, flower color shows lack of dominance. If plants with red flowers are crossed with plants with white flowers, all the F<sub>1</sub> plants have pink flowers. Is it possible for the pink-flowered plants to breed true? Explain using a diagram

True-breeding pink \_\_\_\_\_

5. List the possible gametes produced by a pea plant that is heterozygous for the tall trait (**T**) and heterozygous for the smooth pod (**N**) trait.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. What are the genotype and phenotype ratios for the cross between pea plants heterozygous for the tall trait but homozygous for the constricted pod trait?

Genotype ratio: \_\_\_\_\_

Phenotype ratio: \_\_\_\_\_



7. In mice the allele for colored fur (**F**) is dominant to the allele for albinism (**f**) and the allele for running behavior (**R**) is dominant to the allele for waltzing behavior (**r**). Predict the phenotype ratio for the offspring of a heterozygous colored heterozygous running mouse with a white waltzing mouse.

Phenotype ratio: \_\_\_\_\_

8. In mice the allele for colored fur (**F**) is dominant to the allele for albinism (**f**) and the allele for running behavior (**R**) is dominant to the allele for waltzing behavior (**r**). Predict the phenotype ratio for the offspring of a homozygous colored heterozygous running mouse with a white waltzing mouse.

Phenotype ratio: \_\_\_\_\_

9. In Labrador retrievers coat color is determined by 2 genes that sort independently: melanin production (**B** for black is dominant to **b** for brown) melanin deposition (**E** for deposition is dominant to **e** for no deposition)

Yellow Labrador retrievers may be homozygous dominant or heterozygous for pigment production but are homozygous recessive for melanin deposition. Chocolate Labrador retrievers are homozygous recessive for melanin production but may be homozygous dominant or heterozygous for melanin deposition. Black Labrador retrievers may be homozygous dominant or heterozygous for melanin production and for melanin production.

Write all possible genotypes for yellow, chocolate, and black Labrador retrievers:

Yellow \_\_\_\_\_

Chocolate \_\_\_\_\_

Black \_\_\_\_\_

10. Male and female chocolate Labrador retrievers were mated and had a litter of 12 puppies. Two of the puppies were yellow.

What were the genotypes of the parents?

Parent genotypes \_\_\_\_\_

How many of the other puppies were chocolate and how many were black?  
(Please show your work!)

Chocolate \_\_\_\_\_

Black \_\_\_\_\_

