WLHS/Biology/Oppelt

Name_____

Genetic Crosses that Involve 2 Traits (Dihybrids)

In rabbits, grey hair is dominant to white hair. Also in rabbits, black eyes are dominant to red eyes. These letters represent the genotypes of the rabbits:

GG = gray hair Gg = gray hair gg = white hair	BB = black eyes Bb = black eyes bb = red eyes

1. What are the phenotypes (descriptions) of rabbits that have the following genotypes:

Ggbb _____ ggBB _____

ggbb _____ GgBb _____

2. A male rabbit with the genotype GGbb is crossed with a female rabbit with the genotype ggBb The square is set up below. Fill it out and determine the phenotypes and proportions in the offspring.

	Gb	Gb	Gb	Gb
gB				
gB				
gb				
gb				

How many out of 16 have grey fur and black eyes? _____

How many out of 16 have grey fur and red eyes? _____

How many out of 16 have white fur and black eyes? _____

How many out of 16 have white fur and red eyes? _____

3. A male rabbit with the genotype GgBb . Determine **the gametes** produced by this rabbit (the sperm would have these combinations of alleles) Hint there are 4 combinations.

_____ _____ _____ _____

4. A female rabbit has the genotype ggBb. Determine **the gametes** (eggs) produced by this rabbit.

_____ _____ _____ _____

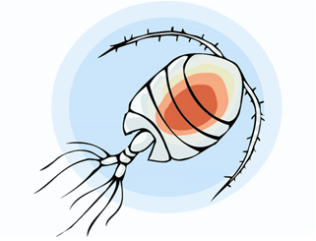
5. Use the gametes from #4 and #5 to set up the punnet square below. Put the male's gametes on the top and the female's gametes down the side. Then fill out the square and determine what kind of offspring would be produced from this cross. **Give the genotypic and phenotypic ratios.**

6. An aquatic arthropod called a Cyclops has antennae that are either smooth or barbed. The allele for barbs is dominant. In the same organism, resistance to pesticides is a recessive trait.

a). Make a "key" to show all the possible genotypes (and phenotypes) of this organism. Use the rabbit key to help you if you're lost.

b). A Cyclops that is resistant to pesticides and has smooth antennae is crossed with one that is heterozygous for both traits. Show the genotypes of the parents. _____ x _____

c) Set up a punnet square for the cross.



d) What are the phenotypic and genotypic ratios of the offspring?

For questions 7 and 8, use the following information as we examine the various crosses between guinea pigs. Assume that in guinea pigs that have golden fur are dominant (G) to silver fur (g) and long hair (L) is dominant to short hair (l).

7. Cross a homozygous golden fur, homozygous long hair guinea pig and a heterozygous golden fur, short haired guinea pig.

a. What are the parents' genotypes? _____ x _____

b. Show the punnett square in the space below. SHOW WORK.

c. What is the genotypic ratio of the offspring? _____

d. What is the phenotypic ratio of the offspring? _____

8. Cross a hybrid golden fur, hybrid long hair guinea pig and a silver, short hair guinea pig.

a. What are the parents' genotypes? _____ x _____

b. Show the punnett square in the space below. SHOW WORK.

c. What is the genotypic ratio of the offspring? _____

d. What is the phenotypic ratio of the offspring? _____