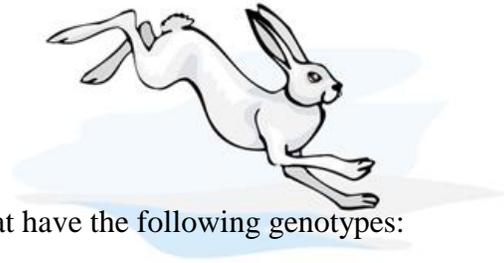


Genetic Crosses that Involve 2 Traits -- Biology 2A

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 = grey hair
Gg = grey 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				

How many out of 16 are:

Grey, red eyed _____

Grey, black eyed _____

White, red eyed _____

White, black eyed _____

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 #3 and #4 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 and in what proportion.

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. 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.



7. 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 _____

8. Set up a punnet square for the cross.

How many are smooth, resistant _____
How many are smooth, not resistant _____
How many are barbed, resistant _____
How many are barbed, not resistant _____

9. A Cyclops that is true breeding for the barbed gene (BB) and resistant to pesticides is crossed with one that is not barbed and resistant to pesticides? How many of the offspring will be barbed and resistant? _____

10. If two Cyclops that are heterozygous for both traits are crossed, what are the resulting phenotypes and in what proportion?