Date_____ Name_____

Dihybrid Crosses and Polygenic Inheritance

In rabbits, grey hair is completely dominant to white hair and black eyes are completely dominant to red eyes.

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 dihybrid cross 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? _____

What is the probability of having an offspring that is grey with red eyes?

3. A male rabbit has 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 produced by this rabbit (the eggs would have these combinations of alleles) Hint there are 4 combinations.

5. Use the gametes from #3 and #4 to set up the dihybrid cross 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. What is the likelihood this pair of rabbits would produce a baby with the genotype ggBb? *Show your work!*

6. A tall, yellow-seeded pea plant heterozygous for height and seed color (TtYy) is crossed with a tall, green-seeded pea plant that is heterozygous for height but homozygous recessive for seed color (Ttyy). If 80 offspring are produced, how many are expected to be tall and have yellow seeds? *Show your work!*