Simple Genetics Practice Problems

1. For each genotype, indicate whether it is heterozygous (HE) or homozygous (HO)

AA ____	Ee ____	Ii ____	Mm ____
Bb ____	ff ____	Jj ____	nn ____
Cc ____	GG ____	kk ____	OO ____
Dd ____	HH ____	Ll ____	Pp

2. For each of the genotypes below, determine the phenotype.

Purple flowers are dominant to white flowers
PP _____
Pp _____
pp _____

Brown eyes are dominant to blue eyes
BB _____
Bb _____
bb _____

Round seeds are dominant to wrinkled
RR _____
Rr _____
rr _____

Bobtails are recessive (long tails dominant)
TT _____
Tt _____
tt _____

3. For each phenotype, list the genotypes. (Remember to use the letter of the dominant trait)

Straight hair is dominant to curly.
_____ straight
_____ straight
_____ curly

Pointed heads are dominant to round heads.
_____ pointed
_____ pointed
_____ round

4. Set up the square for each of the crosses listed below. The trait being studied is round seeds (dominant) and wrinkled seeds (recessive)

Rr x rr

What percentage of the offspring will be round?
_____

Rr x Rr

What percentage of the offspring will be round?
_____

RR x Rr

What percentage of the offspring will be round?
_____

Practice with Crosses. Show all work!

5. A TT (tall) plant is crossed with a tt (short plant).
What percentage of the offspring will be tall? _____

6. A Tt plant is crossed with a Tt plant. What percentage of the offspring will be short? _____

7. A heterozygous round seeded plant (Rr) is crossed with a homozygous round seeded plant (RR). What percentage of the offspring will be homozygous (RR)? _____

8. 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? _____

9. 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? _____

10. A white flowered plant is crossed with a plant that is heterozygous for the trait. What percentage of the offspring will have purple flowers? _____

11. Two plants, both heterozygous for the gene that controls flower color are crossed. What percentage of their offspring

will have purple flowers? _____
What percentage will have white flowers? _____

12. In guinea pigs, the allele for short hair is dominant.
What genotype would a heterozygous short haired guinea pig have? _____
What genotype would a purebreeding short haired guinea pig have? _____
What genotype would a long haired guinea pig have? _____

13. 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? _____

14. 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? _____

15. 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!

Genetic Crosses that Involve 2 Traits -- Biology 2

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.

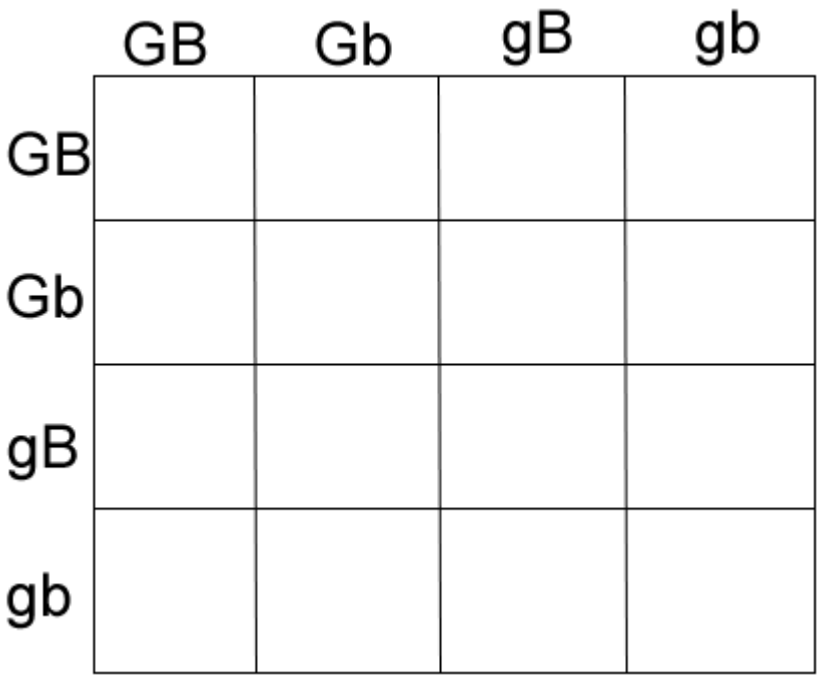
How many out of 16 have grey fur and black eyes? _____

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 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.



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? _____

4. Show the cross between a ggBb and a GGBb. You'll have to set the square up yourself!