Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Simple Genetics Practice Problems**

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

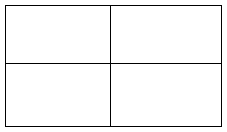
|  |  |  |  |
| --- | --- | --- | --- |
| AA \_\_\_\_ Bb \_\_\_\_ Cc \_\_\_\_ Dd \_\_\_\_ | Ee \_\_\_\_ ff \_\_\_\_ GG \_\_\_\_  HH \_\_\_\_ | Ii \_\_\_\_ Jj \_\_\_\_ kk \_\_\_\_ Ll \_\_\_\_ | Mm \_\_\_\_ nn \_\_\_\_ OO \_\_\_\_ Pp \_\_\_\_ |

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

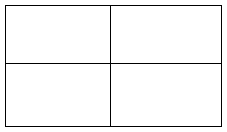
|  |  |
| --- | --- |
| *Purple flowers are dominant to white flowers* PP \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Pp \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pp \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | *Brown eyes are dominant to blue eyes* BB \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Bb \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bb \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  |  |

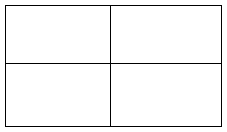
**3. For each phenotype, list the genotypes. (Remember to use the letter of the dominant trait)**

|  |  |
| --- | --- |
| *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** Write the Genotypic ratio: \_\_\_: \_\_\_:\_\_\_   
   
Write the Phenotypic ration: \_\_\_:\_\_\_

**Rr x R r** Write the Genotypic ratio: \_\_\_: \_\_\_:\_\_\_   
   
Write the Phenotypic ration: \_\_\_:\_\_\_

**RR x Rr** Write the Genotypic ratio: \_\_\_: \_\_\_:\_\_\_   
   
Write the Phenotypic ration: \_\_\_:\_\_\_

**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 purple flowered plant that is   
heterozygous. 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 pure-breeding 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!