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!