Simple Genetics Practice Problems

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

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<th>Genotype</th>
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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 crossed, 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!