Monohybrid

1. In pea plants, yellow peas are dominant over green peas. Use a Punnett square to predict the phenotypic and genotypic outcome of a cross between a plant heterozygous for yellow peas and a plant homozygous for green peas. Use Y for dominant and y for recessive.

2. A tall pea plant crossed with a short pea plant produces offspring; of which about half are tall and half are short. What are the genotypes of the parents? Show the possible gamete combinations using a Punnett square.

3. In guinea pigs, a rough coat (R) is dominant over a smooth coat (r) . A particular rough-coated male guinea pig is crossed with a smooth-coated female guinea pig. Use a Punnett square to predict the genotypes and phenotypes of their offspring.

4. Assume the allele for brown eyes (B) in humans is dominant over the allele for blue eyes (b). A brown-eyed man marries a blue-eyed woman, and they have eight children. All eight children are brown-eyed. What are the genotypes of the parents and the children.

5. (a) What is the probability that the first child of two heterozygous brown-eyed parents will be blue-eyed? Show your work using a Punnett square.
(b) If the first child is blue-eyed, what is the probability that the second child will also be blue-eyed?

6. A black coat (B) in guinea pigs is dominant over a white coat (b). How would you determine whether a black coat guinea pig is homozygous or heterozygous for black colour? Use a Punnett square to show how you arrived at your answer.

7. A curly haired Scottish terrier is crossed with a straight-haired Scottish terrier. Curly hair (C) is dominant over straight hair (c). What are the expected phenotypic and genotypic ratios of their offspring?