Punnett Square Problems

Biology

You may work with a partner to determine what each Punnett Square should look like, but you should document your work in your own Google Docs document. Submit through Showbie when you are complete.

1. In pea plants, tall plants are dominant over dwarf plants. Using a Punnett Square, cross a heterozygous tall plant with a second heterozygous tall plant (T = tall, t = dwarf). Identify whether each potential offspring will be tall or dwarf.

2. In pea plants, yellow peas are dominant over green peas. Using a Punnett Square, cross a yellow pea heterozygous plant (Yy) with a plant homozygous recessive for green (yy) peas. Identify whether each potential offspring will be yellow or green.

3. Using a Punnett Square, cross two heterozygous plants. Identify the color of each parent plants peas and whether the peas of each potential offspring will be yellow or green.

4. In pea plants, round peas are dominant over wrinkled peas. Using a Punnett Square, cross a plant that is homozygous dominant with a plant homozygous for wrinkled peas (rr). Identify whether each potential offspring will be round or wrinkled.

5. In humans, brown eyes (B) are dominant over blue (b). A brown-eyed man marries a blue-eyed woman and they have three children, two of whom are brown-eyed and one of whom is blue-eyed. Draw the Punnett square that illustrates this marriage. What is the man's genotype? What are the genotypes of the children?

6. In dogs, there is a hereditary deafness caused by a recessive allele, "d". A kennel owner has a male dog that she wants to use for breeding purposes if possible. The dog can hear, so the owner knows his genotype is either DD or Dd. If the dog's genotype is Dd, the owner does not wish to use him for breeding so that the deafness gene will not be passed on. This can be tested by breeding the dog to a deaf female (dd). Draw the Punnett squares to illustrate the two possible crosses that would result from mating this male with a homozygous recessive female. In each case, what percentage/how many of the offspring would be expected to be hearing? deaf? How could you use the offspring of such a breed to determine the genotype of this male dog?

7. Using a Punnett square, show how two hearing dogs could produce deaf offspring.