Incomplete and Codominance Worksheet

Answer Key

Answer the following questions. Provide a punnett square to support your answers where indicated. Express probabilities as percentages.

1. Explain the difference between incomplete dominance and codominance:
   Incomplete = both alleles are expressed and the phenotype is a "blend"
   Codominance = both alleles are expressed and the phenotype is a mixture or patches of both of them

2. In some chickens, the gene for feather color is controlled by codominance. The allele for black is B and the allele for white is W. The heterozygous phenotype is known as erminette.
   a. What is the genotype for black chickens? __BB__
   b. What is the genotype for white chickens? __WW__
   c. What is the genotype for erminette chickens? __BW__

3. If two erminette chickens were crossed, what is the probability that: (use a Punnett square)

   a. They would have a black chick? = 25%

	B	W
B	BB	BW
W	BW	WW

   50% of the offspring have genotype BW, 25% are BB, and 25% are WW. This means that 50% of the offspring are erminette, 25% are black, and 25% are white.

   b. They would have a white chick? =25%

   (see above punnet square)

4. A black chicken and a white chicken are crossed. What is the probability that they will have erminette chicks?

	B	B
W	BW	BW
W	BW	BW

100% of the offspring have genotype BW. This means that 100% of the offspring are erminette.

5. In snapdragons, flower color is controlled by incomplete dominance. The two alleles are red (R) and white (R'). The heterozygous genotype is expressed as pink.

      a. What is the phenotype of a plant with the genotype RR? ____red_____

      b. What is the phenotype of a plant with the genotype R'R'? ____white_____

      c. What is the phenotype of a plant with the genotype RR'? ____pink_____

6. A pink-flowered plant is crossed with a white-flowered plant. What is the probability of producing a pink-flowered plant?

	R'	R'
R	RR'	RR'
R'	R'R'	R'R'

50% of the offspring have genotype RR' and 50% have genotype R'R'. This means that 50% of the offspring are white and 50% of the offspring are pink.

7. What cross will produce the most pink-flowered plants? Show a punnett square to support your answer.

	R	R
R'	RR'	RR'
R'	RR'	RR'

A cross between a red and white flowered plant would give the most poink-flowered plants = 100%.