

Learning Target: I can define, explain, and demonstrate the difference between codominance and incomplete dominance using Punnett squares.



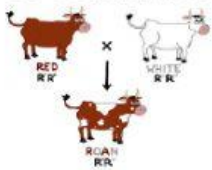
Codominance vs. Incomplete Dominance Interactive Activity

Part 1: Codominance - Use your knowledge to complete the following cloze read.

In Non-Mendelian genetics one allele is not always completely dominant over another allele. Sometimes multiples alleles can be shown. In codominance, neither _____ is recessive or _____ by the other allele. As a result, both alleles are equally _____, and you can see both of their features in the physical appearance or _____. Codominance is like a true "co-teaching" model, where each teacher plays an equal role in helping the students learn. Both teachers are physically present in the classroom and neither teacher is _____ over the other teacher.

Part 2: Codominance – Setup and complete the Punnett squares to answer the questions.

CO-DOMINANCE:



- In roan cows (R^rR^w), red coat genotype (R^rR^r) and white coat genotype is (R^wR^w) are codominant. When a cow has these hybrid (mixed) genotypes, it has a mix of red and white coat. (Use the letter R^r or R^w)

- What is the genotype for red coat cows? _____
- What is the genotype for white coat cows? _____
- What is the genotype for roan coat cows? _____

- What happens when you breed a roan coat cow with a white coat cow?
 - What is the probability of having cows with roan coat? _____
 - What is the probability of having cows with white coat? _____
 - What is the probability of having cows with red coat? _____

- Two roan coat cows are crossed. What is the probability that they will have roan coat? _____

- In checkered chickens (BW), black feather genotype (BB) and white feather genotype (WW) are codominant. When a chicken has these hybrid (mixed) genotypes, it has a mix of black and white feathers.
 - What is the genotype for black feather chickens? _____
 - What is the genotype for white feather chickens? _____
 - What is the genotype for black and white feather chickens? _____

- What happens when you breed a black and white feather chicken with a black feather chicken?
 - What is the probability of having chickens with black and white feathers? _____
 - What is the probability of having chickens with black feathers? _____
 - What is the probability of having chickens with white feathers? _____

- Two black and white coat chickens are crossed. What is the probability that they will have black and white feathers? _____ (Make a Punnett square to solve the problem)

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Part 3: Incomplete dominance - Use your knowledge to complete the following cloze read.

In Non-Mendelian genetics one _____ is not always completely dominant over another allele. In incomplete dominance the dominant allele can't completely _____ or cover up the recessive allele. As a result, both alleles are _____ together, and you can see the blending of their features in the physical appearance or _____.

For example, in flowers red (R) is dominant over white (r). $RR = \underline{\hspace{1cm}}$ $rr = \underline{\hspace{1cm}}$ but $Rr = \text{Pink}$. You can also see it like this as Red (R) is _____. White (r) is _____. $RR = \underline{\hspace{1cm}}$, $R'R' = \underline{\hspace{1cm}}$ and $RR' = \underline{\hspace{1cm}}$ because both alleles blended.

Remember: In incomplete dominance, the heterozygous phenotype is in between the dominant and recessive alleles or genes for that trait. That is why they _____.

Part 4: Incomplete dominance – Setup and complete the Punnett squares to answer the questions.

7. In roan horses, fur coat color is controlled by incomplete dominance. The two alleles are brown (B) and white (B'). Brown = (BB), White = (B'B'). The heterozygous genotype is expressed as palomino (BB' = light brown) in the phenotype or physical appearance.
 - a. What is the phenotype (physical appearance) of a horse with the genotype BB? _____
 - b. What is the phenotype (physical appearance) of a horse with the genotype BB'? _____
 - c. What is the phenotype (physical appearance) of a horse with the genotype B'B'? _____

8. A brown horse is crossed with a white horse.
 - a. What is the probability of getting a brown horse? _____
 - b. What is the probability of getting a palomino horse? _____
 - c. What is the probability of getting a white horse? _____

9. A palomino horse is crossed with a brown horse.
 - a. What is the probability of getting a palomino horse? _____
 - b. What is the probability of getting a brown horse? _____
 - c. What is the probability of getting a white horse? _____

10. Explain the difference between codominance and incomplete dominance. _____



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