

INCOMPLETE DOMINANCE CROSSES

In some traits, a single allele is not "strong" enough to be expressed; therefore, a weaker or washed out form of the trait occurs. When the organism is homozygous, the full effect of the trait is expressed.

In the classic example of snapdragons, when a red and a white flower are crossed, the offspring are all pink. When performing crosses in which there is no dominant gene, a different key is used. Two different capital letters are used for the alleles rather than using a capital letter for the dominant gene and the lower case form of the letter for the recessive allele.

We write the key as follows: RR = red; WW = white; RW = pink.

Punnett squares are still used to determine the likelihood of any particular trait being expressed; only the key has a different look.

CODOMINANT CROSSES

Codominance is very similar to incomplete dominance. The difference is that instead of an intermediate form of the phenotype developing, BOTH alleles are expressed resulting in a mixed, spotted or striped appearance.

In the classic example of cattle, when a red organism is mated with a white one, the offspring have equal numbers of red and white hairs, a condition known as roan.

We write the key as RR = red; R'R' = white; and R'R = roan.

Punnett squares can be used for these problems, and the outcome will look just like incomplete dominance.

HOW DOES INCOMPLETE DOMINANCE DIFFER FROM CODOMINANCE?

Codominance is a form of inheritance in which both alleles are equally shown. Blood typing is a great example. AB blood is the codominant relationship between the A protein and B protein both expressing themselves completely on red blood cells.

Incomplete dominance is a form of inheritance in which the heterozygous alleles are both expressed, resulting in a combined phenotype.

The one example that most books give is seen in some flower colors. A red and a white allele create pink, not red and white stripes.

Name _____

Practice: Codominance and Incomplete Dominance

1. Practice setting up keys for the phenotypes listed in each set. Remember that the "medium" trait must always be heterozygous.

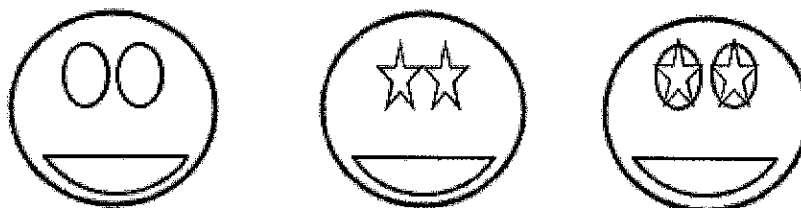
- Birds can be blue, white, or white with blue-tipped feathers.
- Flowers can be white, pink, or red.
- A Hoo can have curly hair, spiked hair, or a mix of both curly and spiked.
- A Sneech can be tall, medium, or short.
- A Bleexo can be spotted, black, or white.



2. Now, can you figure out in the above list, which of the letters represent codominant traits and which are incomplete.

Codominant _____ Incompletely Dominant _____

3. In Smileys, eye shape can be starred, circular, or a circle with a star. Write the genotypes for the pictured phenotypes



4. Show the cross between a star-eyed and a circle eyed.

What are the phenotypes of the offspring? _____

What are the genotypes? _____

5. Show the cross between a circle-star eyed, and a circle eyed.

How many of the offspring are circle-eyed? _____

How many of the offspring are circle-star eyed? _____

6. Show the cross between two circle-star eyed.

How many of the offspring are circle-eyed? _____

How many of the offspring are circle-star eyed? _____

How many are star eyed? _____