

Name: _____

Genetics Worksheet 4 Codominance

There is another pattern of inheritance that also is an example of lack of dominance. In this situation, if the resulting phenotype *exhibits both traits of the parents*, the offspring phenotype is said to be the result of **codominance**. Examples of this include A and B blood types in humans, sickle-cell disease, and coat color in cattle and horses.

In this last example, cattle which are homozygous for a red coat allele are red, cattle which are homozygous for a white coat allele are white, and heterozygous cattle appear roan (red hairs mixed with white) due to codominance of the red and white coat color alleles. In this case it is common to use two different capital letters of the alphabet as superscripts to a common letter, to represent the red and white coat color alleles. For example, red cattle would be $C^R C^R$, white cattle would be $C^W C^W$, and roan cattle would be $C^R C^W$, where:

C^R = red coat

C^W = white coat

How is this different from red, white, and pink flowers?

- Cattle coat color would be considered incompletely dominant if $C^R C^W$ were completely pink, instead of a patchy red and white.
- Carnation petal color would be considered codominant if RW were red and white striped, instead of solid pink.

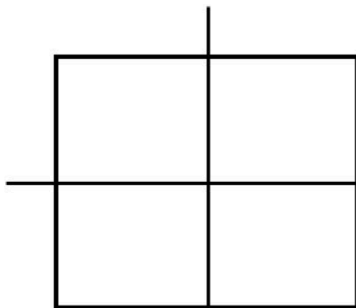
Nevertheless, both these patterns of inheritance are important for they deviate from the basic dominant/recessive pattern of inheritance.

In summary:	Cattle and Horse Coat Color
<u>Genotype</u>	<u>Resulting Phenotype</u>
$C^R C^R$	Red coat
$C^W C^W$	White coat
$C^R C^W$	Roan coat (red hairs mixed with white)

1. A roan bull (male) is mated with a white cow (female). What are the possible offspring?

Bull's genotype: _____

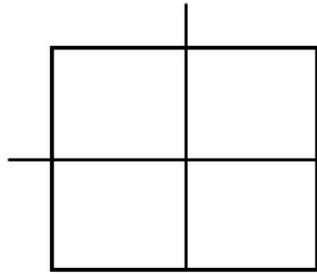
Cow's genotype: _____



Genotypes	Phenotypes

2. Could a red bull be the offspring of a roan bull and a white cow? Why or why not?

3. If the bull is roan, what color must the cow be in order to get 50% solid red offspring?

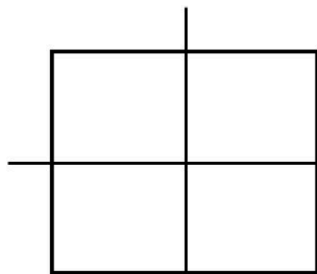


Genotypes	Phenotypes

Feather color is codominant in southern weebilers. A solid white bird will have $F^W F^W$ while a solid blue bird will have $F^B F^B$.

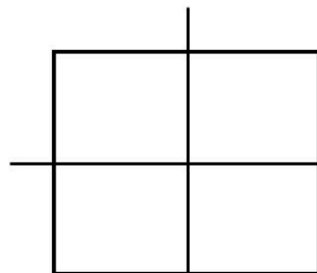
4. What would the genotype of a bird with both white and blue feathers be? _____

5. Below cross a white bird with a blue bird



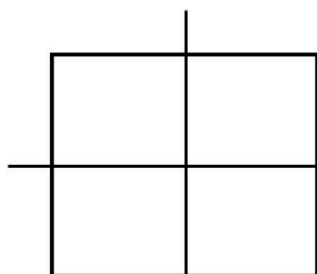
Genotypes	Phenotypes

6. By taking two of the offspring above, what is the probability of having a blue offspring? _____



Genotypes	Phenotypes

7. The offspring of two birds are 50% white and 50% white/blue. If the mother was white what color was the father?



Genotypes	Phenotypes