

Name: _____

Genetics Worksheet 3 Incomplete dominance

Incomplete Dominance

Previously you have studied genes in which one allele (one copy of a gene) was dominant and the other recessive. For instance, a heterozygous individual whose genotype is Hh, where "H" = right handedness and "h" = left handedness, would be right handed, since the right handed allele is dominant.

There are some gene pairs in which **neither allele is dominant**, and **when both alleles are present in the chromosomes both traits are expressed in the phenotype**. The resulting heterozygote phenotype is typically *in between* the two different homozygote phenotypes. This pattern of inheritance is called **incomplete dominance**. Examples of this include petal coloration in some flower species, curliness of human hair, and human hypercholesterolemia.

In the first example, snap dragons or carnations that are homozygous for a red petal allele are red, flowers which are homozygous for a white petal allele are white, and heterozygous flowers appear pink due to the lack of dominance between the red and white color alleles.

In this case it is common to use two different capital letters of the alphabet to represent the red and white alleles, such that:

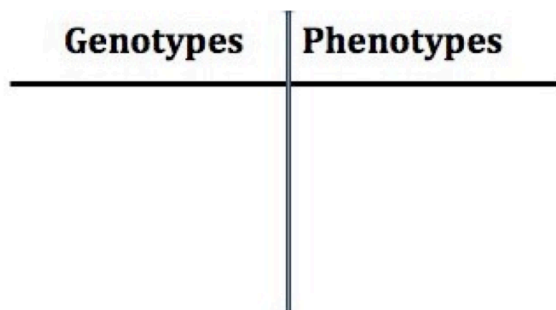
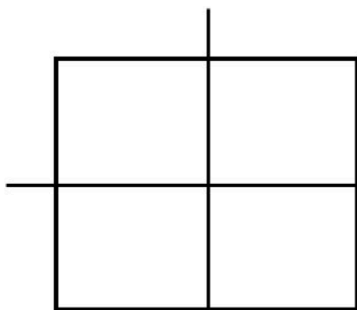
R = Red color

W = White color

In this example, red carnations would be RR, white carnations would be WW, and pink carnations would be RW. This is summarized below.

<u>Genotype</u>	<u>Resulting Phenotype</u>
RR	Red flowers
WW	White flowers
RW	Pink flowers

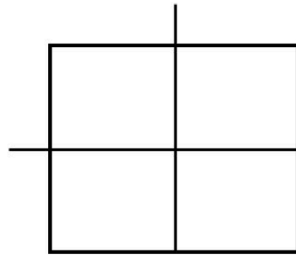
1. Carnations (a flower) demonstrate incomplete dominance, a RR genotype results in a red flower, a WW flower results in a white flower and RW is pink. What would be the result of a cross between a pink and a white carnation?



2. Could Red offspring be made from a cross of a White carnation with a Pink one? Why?
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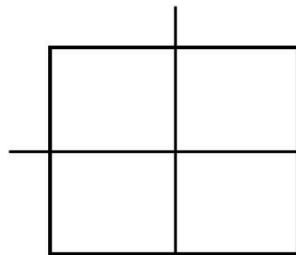
3. In some cats, the gene for tail length shows incomplete dominance. When a cat with a long tail is bred to a cat with no tail, the resulting offspring have short tails. For each of the following, predict the types of offspring that would result:

a) A long tail cat bred to a cat with no tail



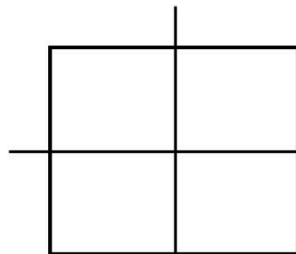
Genotypes	Phenotypes

b) A long tail cat bred to a short tail cat



Genotypes	Phenotypes

c) Two short tail cats

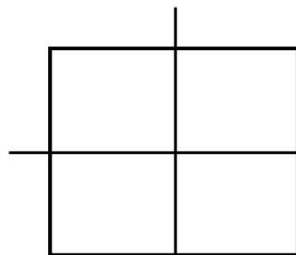


Genotypes	Phenotypes

4. In four o'clocks, flower color is due to incomplete dominance. Some flowers are red, some are yellow, and others are orange. Cross a red flower with an orange flower.

_____ What is the genotype of the red flower?

_____ What is the genotype of the orange flower?



Genotypes	Phenotypes

_____ What is the probability of getting red offspring?

_____ What is the probability of getting yellow offspring?

_____ What is the probability of getting orange offspring?