

Exceptions to Mendel's Rules

Name _____

Period _____ Date _____

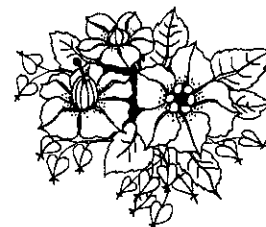
INCOMPLETE dominance: Neither allele is dominant

- Results in a mixture of the two alleles
- Example: Crossing a pure red flower with a pure white flower makes a pink flower

Use the following symbols for the punnett square.

- C^R represents the red allele
- C^W represents the white allele
- A pure red flower is represented by this symbol: $C^R C^R$
- A pure white flower is represented by this symbol: $C^W C^W$
- A pink flower is represented by this symbol: $C^R C^W$

The capital C represents the trait for flower color



Fill in the punnett square below. Cross a pure red flower with a pure white flower.

$$\begin{array}{c} C^R C^R \\ \hline C^R \quad C^R \\ \hline \end{array} \times \begin{array}{c} C^W C^W \\ \hline C^W \quad C^W \\ \hline \end{array}$$

C^W	$C^R C^W$	$C^R C^W$
C^W	$C^R C^W$	$C^R C^W$

Genotype	Phenotype
$C^R C^W$	(100%) pink

Now cross the offspring of the flowers above.

$$\begin{array}{c} C^R C^W \\ \hline C^R \quad C^W \\ \hline \end{array} \times \begin{array}{c} C^R C^W \\ \hline C^R \quad C^W \\ \hline \end{array}$$

C^R	$C^R C^R$	$C^R C^W$
C^W	$C^R C^W$	$C^W C^W$

Genotype	Phenotype
$C^R C^R$	Red (25%)
$C^W C^W$	White (25%)
$C^R C^W$	Pink (50%)

Study the example with the horses.

What color horse do you get when you cross a Chestnut with a Cremello? ^(DK. brown) ^(white) Lt. brown (Palomino)

This is another example of incomplete dominance.

CODOMINANCE - both alleles are dominant.

- Results in the expression of both alleles

Look at the pictures on the slides.

When you cross a white cow with a brown cow, you get a brown & white spotted cow. Both colors show up. They are both dominant.

With codominance, what do you get when you cross a black chicken with a white chicken? (see picture)

black & white Chicken

With codominance, what do you get when you cross a red fish with a blue fish?

red & blue fish

Answer the following questions.

1. Cross a blue alien with a red alien. They show incomplete dominance. Use the symbol "C" for the trait of alien color. R=red; B=blue. Show the punnett square. Include phenotypes and genotypes.

$C^B C^B$	X		$C^R C^R$
C^B	C^B	C^R	C^R
C^R	$C^B C^R$	$C^B C^R$	
C^R	$C^B C^R$	$C^B C^R$	

Genotype	Phenotype
$C^B C^R$	purple (100%)

2. Now, let's say this alien is codominant for red and blue. What would the alien offspring look like?

red & blue aliens