

# Incomplete Dominance & Codominance

SBI3C Biology

# Incomplete Dominance

- An allele that can't totally block the recessive allele
- One dominant allele isn't enough to give the dominant trait
- When homozygous dominant = full dominant trait
- When homozygous recessive = full recessive trait
- **When heterozygous = an intermediate trait**

# Example: Four O'Clock Flowers

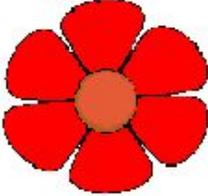
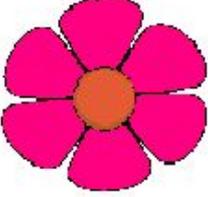
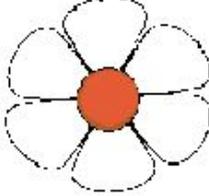
Red = Dominant allele R

White = Recessive allele, r

Red flowers must be Homozygous Dominant

White flowers must be Homozygous recessive

**Heterozygous flowers are pink**

	R	r
R	RR 	Rr 
r	Rr 	rr 

# Example: Roan Horses

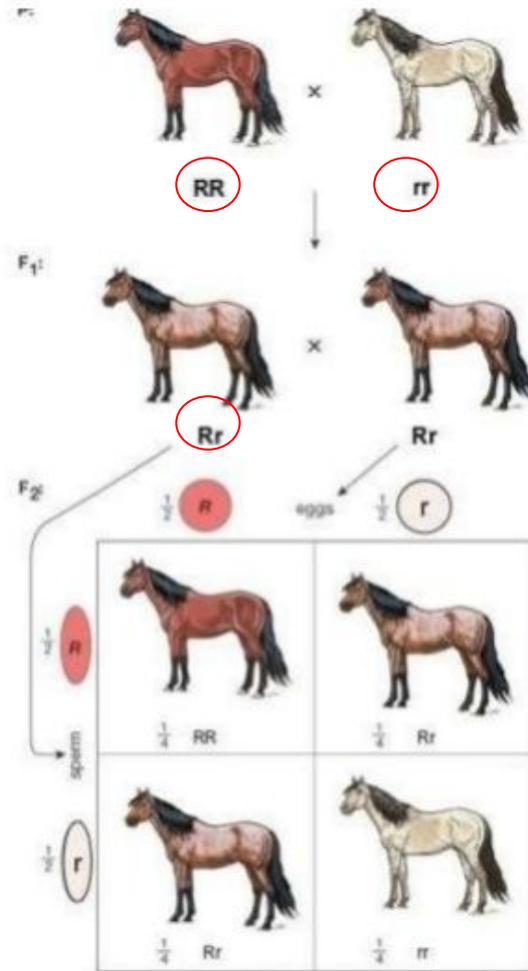
Chestnut = Dominant R

Cream = Recessive, r

RR Chestnut horse

rr Palomino horse

Rr Roan horse



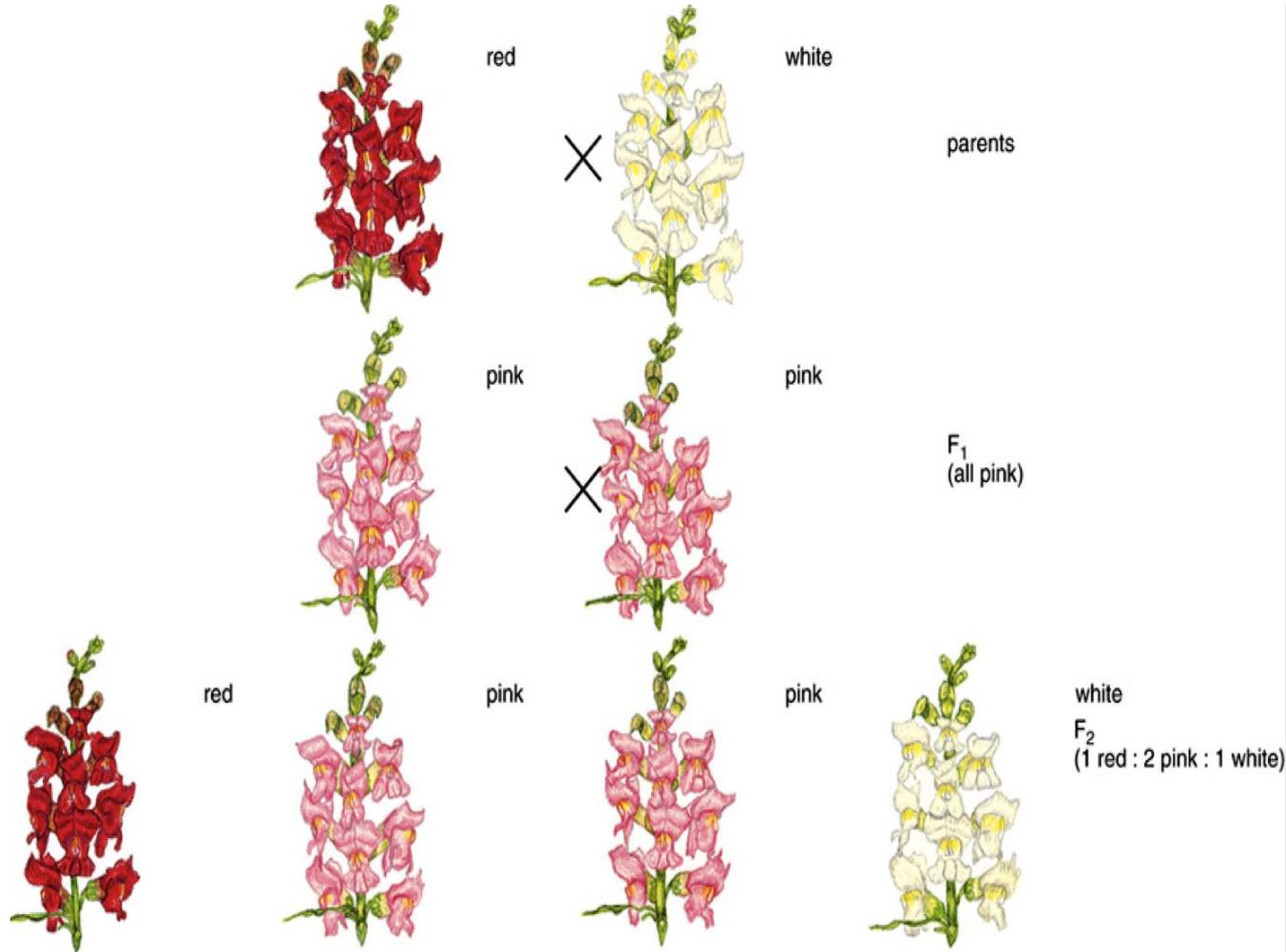
Roan Horse



<http://search.vadilo.com/b/q?rel=2&keys=Dominance+Incomplete+Dominance+Codominance+PPT>

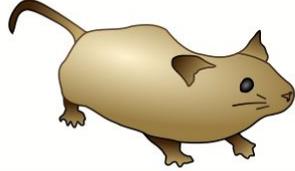
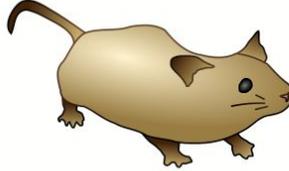
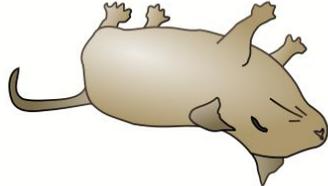
# Example: Snapdragons

Hybrids are pink. The red and white trait can reappear in the second generation.



# Example: Lethal genes in Mice

One coat colour gene produces wild type agouti fur if homozygous dominant, or yellow fur if heterozygous, but is lethal if homozygous recessive!

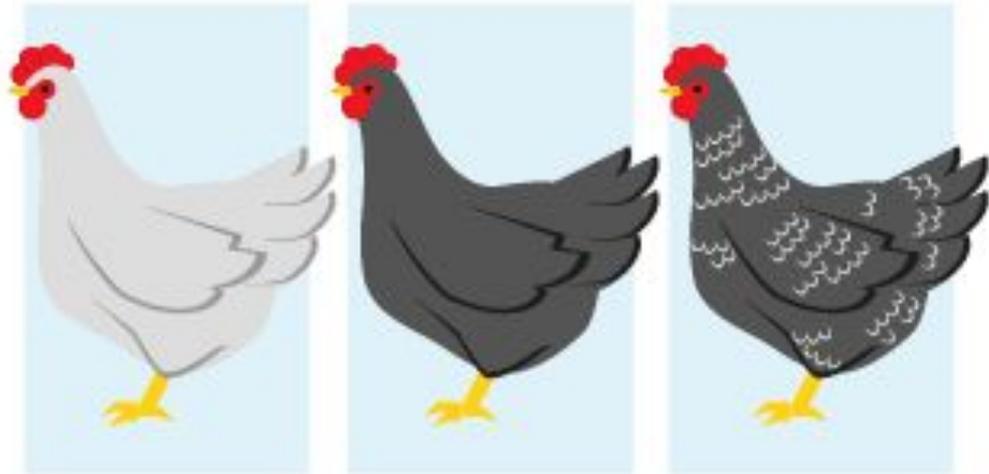
	A	a
A	Agouti coat <b>AA</b> 	Yellow Coat <b>Aa</b> 
a	Yellow coat <b>Aa</b> 	Dead <b>aa</b> 

# Codominance

- Dominant doesn't block the recessive
- When homozygous dominant = full dominant trait
- When homozygous recessive = full recessive trait
- **When heterozygous = both traits are seen**

# Example: Andalusian Chickens

Heterozygous chickens have black and white feathers.



<b>Phenotype</b>	WHITE	BLACK	SPECKLED
<b>Genotype</b>	WW	BB	BW

# Example: Camelia Flowers

When white and red flowers cross-pollinate, they produce seeds that will give plants with red and white flowers.

*White Camellia*



*Red Camellia*



X

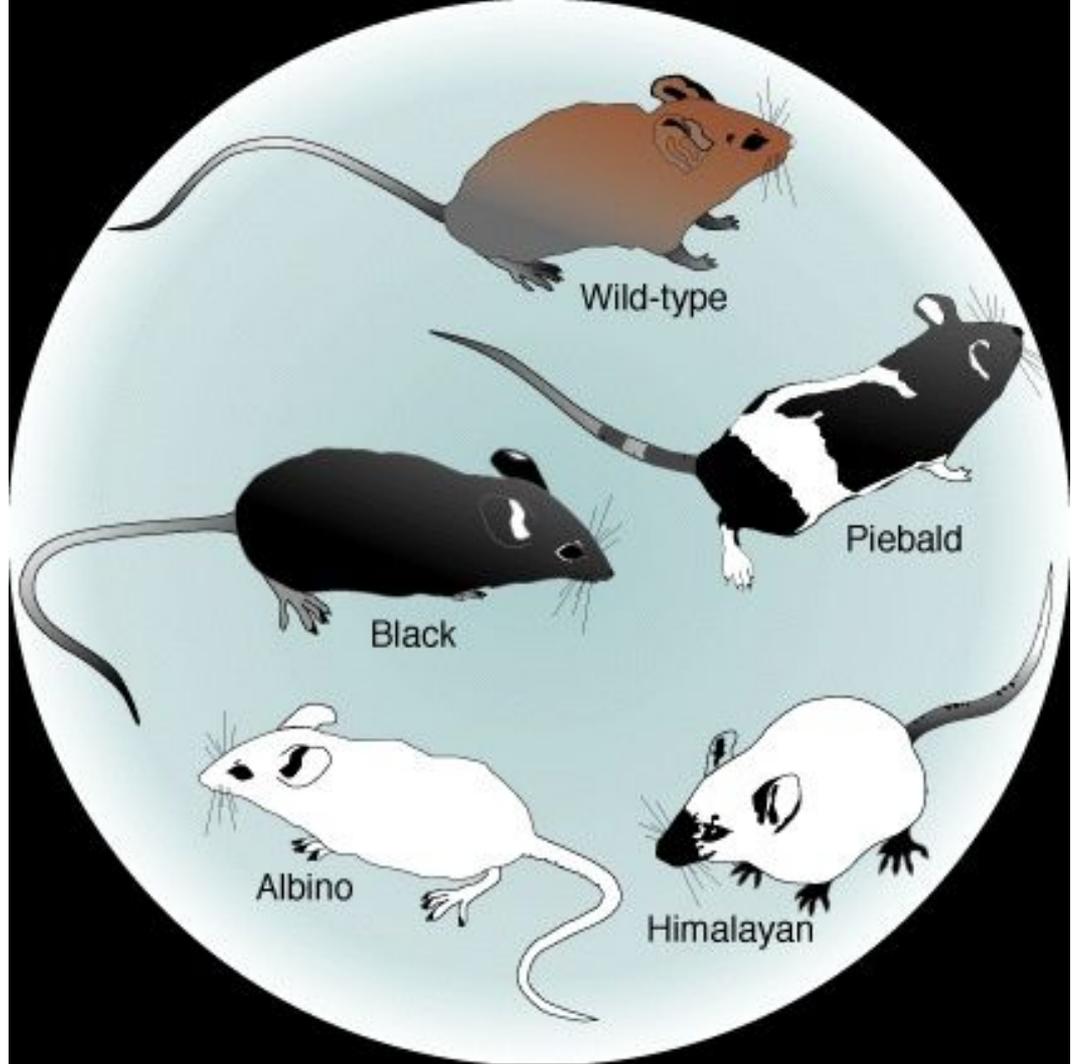


*Red and White Camellia*



# Example: Mice

There are many different coat colour genes. Piebald and Himalayan are Heterozygous of Black (dom) and White (rec).



## Try these:

1. A gardener is developing a new type of tulip. She knows that in tulips, Red is dominant and white is recessive. She crosses a purebred red flower with a purebred white flower. What will be the result if the alleles are incomplete dominant? Use symbols R and r
2. Pigeon breeders value a wing pattern called checked. It looks like cross hatching or check marks of black, on the wing feathers. The regular patterns are barred (two strips, dominant) or clear (no markings at all, recessive). These alleles are a codominant. If two checked-wing birds are mated, what will the offspring look like? Use symbols C and c

# Solutions:

## 1. Tulips:

Genotypic ratio 1:0

All Heterozygous

Phenotypic ratio 1:0

All red & white striped

	R	R
r	Rr	Rr
r	Rr	Rr

# Solutions:

2. Pigeons: Phenotypic ratio 1:2:1

25% barred, 50% checked, 25% clear

Genotypic ratio 1:2:1

	C	c
C	CC	Cc
c	Cc	cc