Beyond Mendel's Laws

both equally present

mixing

Beyond Mendel's Laws

Incomplete Dominance

Beyond Mendel's Laws

Incomplete Dominance

- blending of a single trait

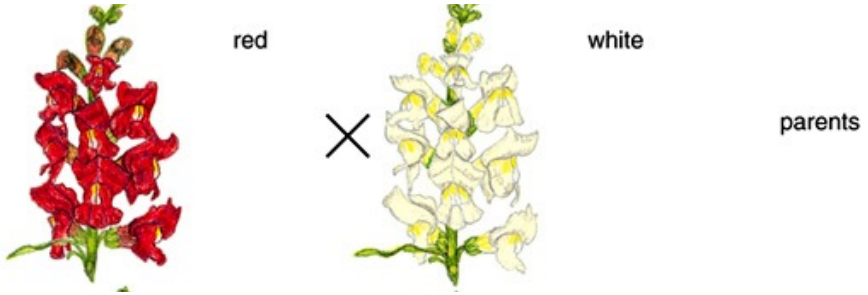
- when heterozygous individuals expresses neither one of the trait

---> intermediate expression of traits

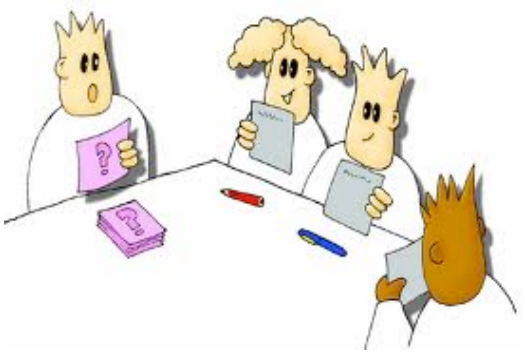
eg: flower colour in snapdragons - 2 alleles are red (C^R) & white (C^W)

red (C^RC^R) white (C^WC^W) _____ ($C^R C^W$)

What do you see in the F1 generation? (C^RC^R X C^WC^W)



$C^R C^W$



What do you see in the F2 generation?

Pink Pink

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

pink

$C^R C^W$

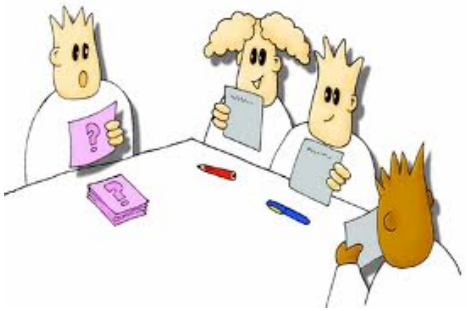
pink

$C^R C^W$

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

Phenotype- 1 RED : 2 Pink : 1White

Genotype- 1 $C^R C^R$: 2 $C^R C^W$: 1 $C^W C^W$



*The allele for normal hemoglobin is represented by Hb^A, and the allele for sickle cell hemoglobin is represented as Hb^S. Individuals who are homozygous (Hb^SHb^S) have sickle cell anemia. Individuals who are heterozygous have someone normal and some sickled red blood cells. What is the outcome of offspring between a man and a woman who are both **carriers** (has one allele) for sickle cell?*

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SICKLE-CELL ANEMIA

Co-dominance

Co-dominance

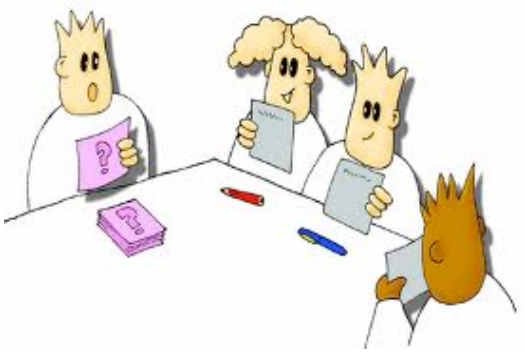
- both alleles are dominant; both are expressed in the heterozygous individuals

eg: Feather colour in chickens - 2 alleles are black (I^B) and white (I^W)

$I^B I^B$ = Black

$I^B I^W$ = Black and White

$I^W I^W$= White

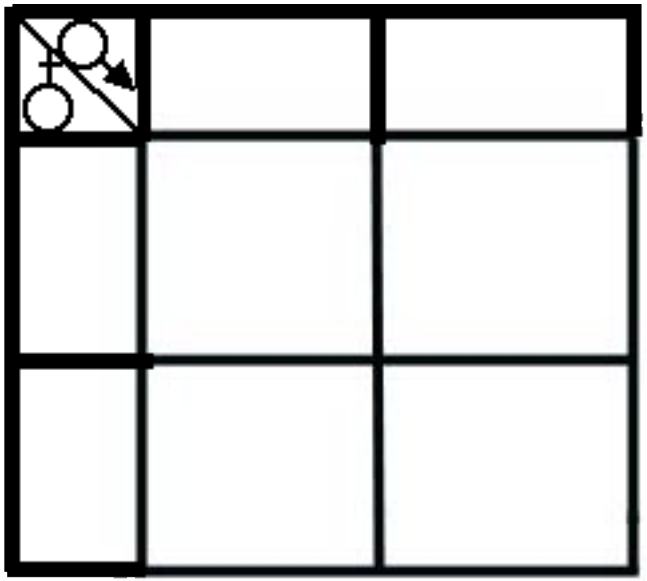


A black chicken is crossed with a checkered chicken. What is the phenotypic and genotypic outcome?

Black- $I^B I^B$

Checkered

$I^B I^W$

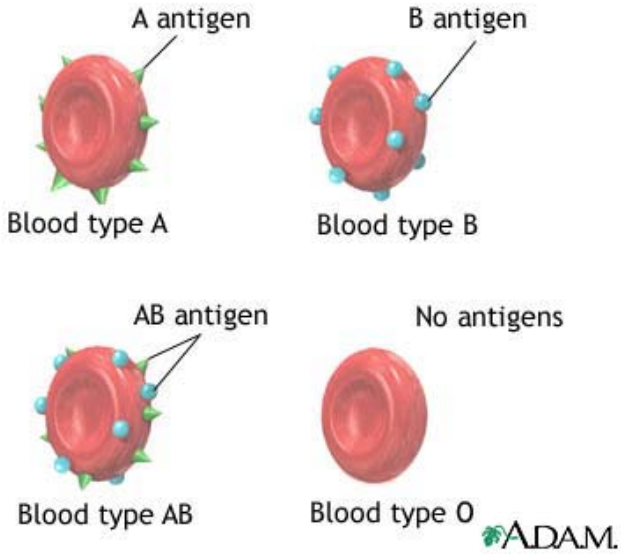


Multiple Alleles

- more than two alleles involved

eg: blood types

- 3 alleles are A, B, O
- everyone has 2 of the 3 alleles
- represented by I^A, I^B, i



- A & B: - co-dominant with each other
  - dominant over O

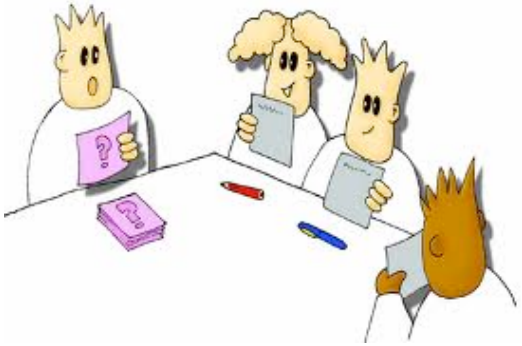
What is the genotype of:

Type A- I^A i or I^A I^A

Type B- I^B i or I^B I^B

Type AB- I^A I^B

Type O- i i

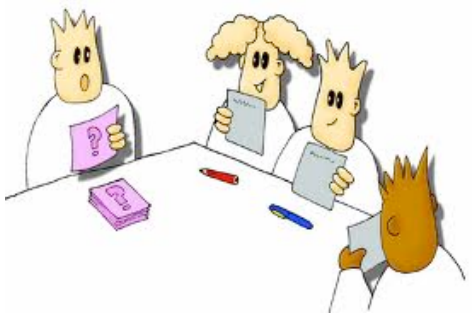


A man with blood type A meets a woman of blood type B. They have four kids, each with a different blood type.

a. What are the possible genotypes of the man?

b. What are the possible genotypes of the woman?

c. Show the cross that will produce the proper results.



A man and a woman can have kids that are A and AB, but not B and O.

a. What are the two possibilities for genotypes of the parents?

Class and Homework

- Try the 5 questions on Edsby in the PDF
- Data Based questions , page 172-3 on mouse coat colour
- Data based questions , page 173 on Spots of Ladybird beetles