

- Example: Flower colour of Snapdragons. Cross of C^rC^r (red) and C^wC^w (white) $\rightarrow F_1 [C^rC^w$ (pink)] $\rightarrow F_2$ [1 C^rC^r , 2 C^rC^w , 1 C^wC^w , 1:2:1 phenotypic ratio instead of 3:1]

d. Codominance

- 2 alleles encode different gene products
- Heterozygote expresses both alleles
- Example: Human MN blood group $\rightarrow$ 1:2:1 phenotypic ratio instead of 3:1

Gametes	L^M	L^N
L^M	L^M/L^M M	L^M/L^N MN
L^N	L^M/L^N MN	L^N/L^N N

e. Multiple Alleles in a population

- NOT bi-allelic genes, 3 or more alleles
- Example: Human ABO blood system (3 alleles, 6 genotypes, 4 phenotypes)

f. Two genes affecting a single trait

- Example: Skin pigmentation in corn snakes; one gene determines orange pigment and the other determines black pigment and *act independently*

Mendelian F_2 ratio	Genotype	Phenotype
9/16	$O_B_$	Camouflaged
3/16	O_bb	Orange
3/16	$oo/B_$	Black
1/16	oo/bb	Albino



g. Epistasis

- An interaction between 2 genes in a pathway whereby one gene interferes with the phenotypic expression of other gene

(A)	$AA BB$ 1 $AA Bb$ 2 $Aa BB$ 2 $Aa Bb$ 4 9	$AA bb$ 1 $Aa bb$ 2 3	$aa BB$ 1 $aa Bb$ 2 3	$aa bb$ 1 1	Unmodified ratio 9 : 3 : 3 : 1
	Color below shows phenotypic expression				
(B)	9	3	3	1	12 : 3 : 1 $\rightarrow$ Dominant epistasis
	9	3	3	1	10 : 3 : 3
	9	3	3	1	9 : 6 : 1 $\rightarrow$ Duplicate genes with cumulative effect
	9	3	3	1	9 : 4 : 3 $\rightarrow$ Recessive epistasis
	9	3	3	1	15 : 1 $\rightarrow$ Duplicate dominant genes
	9	3	3	1	13 : 3 $\rightarrow$ Dominant and recessive interaction
	9	3	3	1	12 : 4
	9	3	3	1	10 : 6
	9	3	3	1	9 : 7 $\rightarrow$ Duplicate recessive genes/Complementary gene action