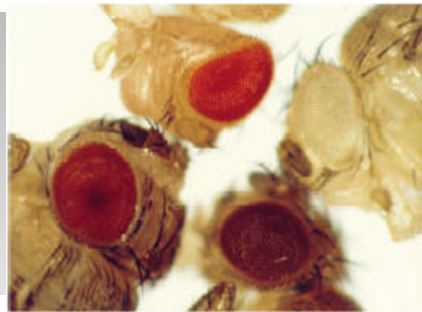


Multiple Alleles

- **Multiple alleles** are when there are more than two different alleles for one trait.
 - **Example:** Fruit flies can have several different eye colors, such as red, apricot, honey, and white. The dominant hierarchy is as follows: red dominant to apricot, is dominant to honey, is dominant to white.
- Capital letters and subscript numbers are used to express the different genes and their combinations.

- Fruit flies can have 4 different eye colours
- Wild type (red)
- Apricot colour
- Honey colour
- White colour



- Eye colour is controlled by 4 different genes
- Which one wins?
- The order is this:

red > apricot colour > honey colour > white

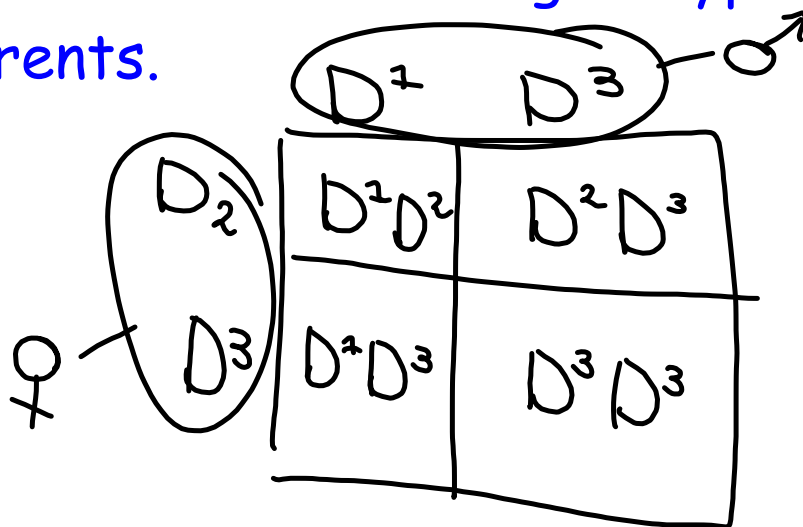
Geneticist determine this order by seeing which colour shows up the most (red) in fly populations, followed by the next most abundant (apricot) and so on.

<u>Phenotype</u>	<u>Genotype</u>	<u>Dominant To</u>
1 Red	$E^1E^1, E^1E^2, E^1E^3, E^1E^4$	Apricot, Honey, White
2 Apricot	E^2E^2, E^2E^3, E^2E^4	Honey, White
3 Honey	E^3E^3, E^3E^4	White
4 White	E^4E^4	

E^1E^4 (red eye color) X E^2E^3 (apricot eye color)

	E^2	E^3
E^1	E^1E^2	E^1E^3
E^4	E^2E^4	E^3E^4

Multiple alleles control the intensity of pigment in mice. The D^1 designates full colour, D^2 designates dilute colour, and D^3 is deadly when homozygous. When a full colour male is mated to a dilute colour female the offspring are produced in the following ratio: 2 full colour to 1 dilute to 1 dead. Determine the genotypes of the parents.



Blood types involve multiple alleles and co dominance

ex type A - $I^A I^A$ or $I^A i$ or $I^A I^O$

type B - $I^B I^B$ or $I^B i$ or $I^B I^O$

type AB - $I^A I^B$

type O - ii or $I^O I^O$

What possible blood types would result from a cross between a heterozygous type

A person and someone with type AB

$I^A I^O$ or $I^A i$

	I^A	I^O
I^A	AA	AO
I^B	AB	BO

	I^A	i
I^A	AA	Ai
I^B	AB	Bi