

Other forms of “Dominance”...

1. Complete dominance :

- “Mendelian traits” already studied
- 3:1 result in F2 monohybrid cross
- 9:3:3:1 in dihybrid if both parents are heterozygous for two traits

2. Incomplete dominance :

- **neither allele of a trait is dominant over the other**, what’s expressed is a combination of both alleles (similar to the “Blend Theory” of Mendel’s day)

- white X red snapdragons = PINK
- Punnett squares are done using all capital letters, one letter with a symbol to distinguish it.

Ex. R for red flower
R' for white flower

- traits still follow 2 of Mendel's 3 Laws...dominance goes out the window

3. Co-Dominance :

- similar to incomplete dominance (neither allele dominant over the other), but what we get is not a

blend....the organism shows BOTH phenotypes at the same time

- black hen X white hen = grizzly hen

4. Multiple Alleles :

- any trait having more than two forms (alleles)
- ex. Human blood types....
(“i” is used for the “O” allele)
(A and B are co-dominant, but completely dominant over O)

AA or AO.....type A

BB or BO.....type B

AB.....type AB

OO.....type O

- ex. Skin tone
Eye color
Hair color
- all controlled by multiple alleles in different places of different genes. Their interactions produce many variations.

Human ABO cross examples
Punnett Square practice

Test Crosses :

- mating a creature (whose genotype we are unsure of) with another of known genotype (ex. Homozygous recessive) and observing the results.

- done to determine what alleles are present in the parent.

If recessiveness appears in the offspring, the parent was hybrid.

How can you tell if a trait is a multiple allele trait ?

- any observed ratio allows us to conclude how many pairs of alleles are involved in controlling a trait

3:11 pair (Mendelian)
9:3:3:12 pairs
no ratiomultiple pairs on multiple genes

Test crosses can be done with other creatures, but in humans, we study family pedigree diagrams, showing genetic / family relationships (page 544....symbol key)