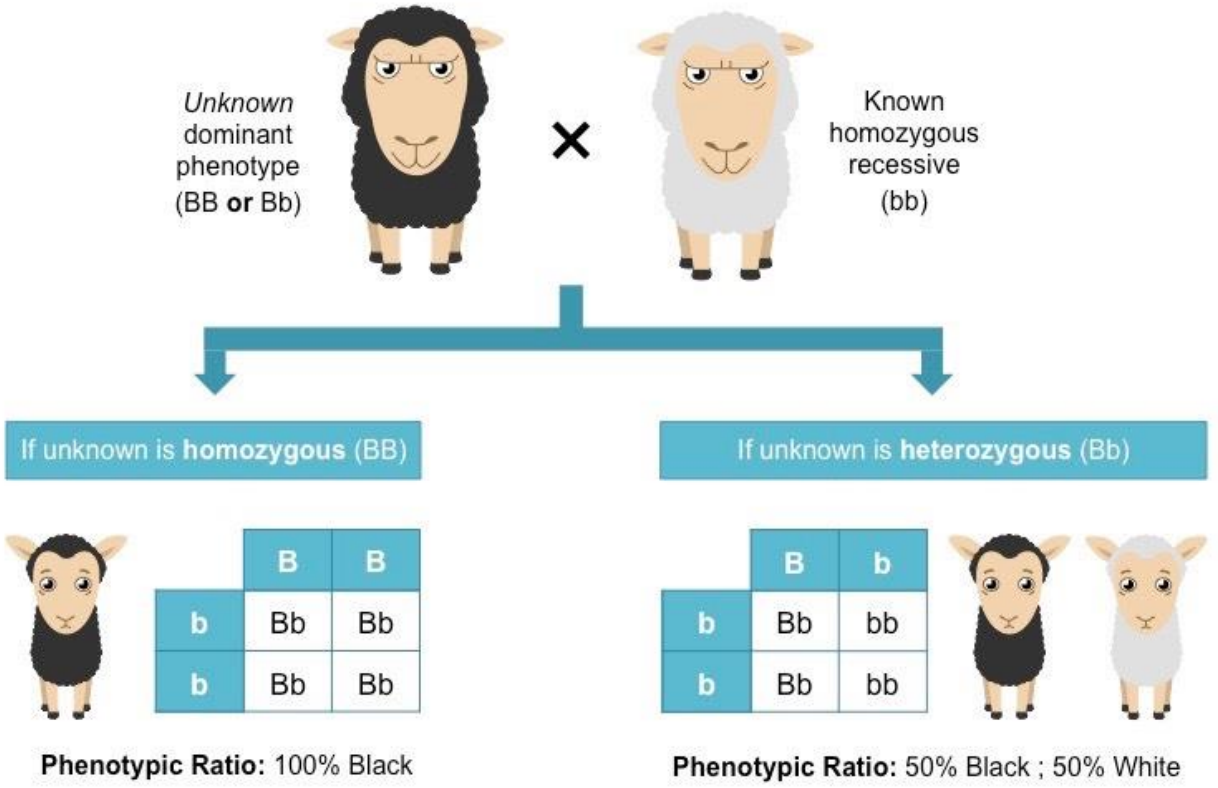
- A **testcross** examines the genotype of an organism that shows the dominant phenotype for a given trait. In a **testcross**, an organism with an unknown genotype but dominant phenotype is crossed with an organism that is homozygous recessive for the same trait.

Testing an Unknown Dominant Phenotype

Test crosses can be used to determine whether a dominant phenotype is homozygous or heterozygous.

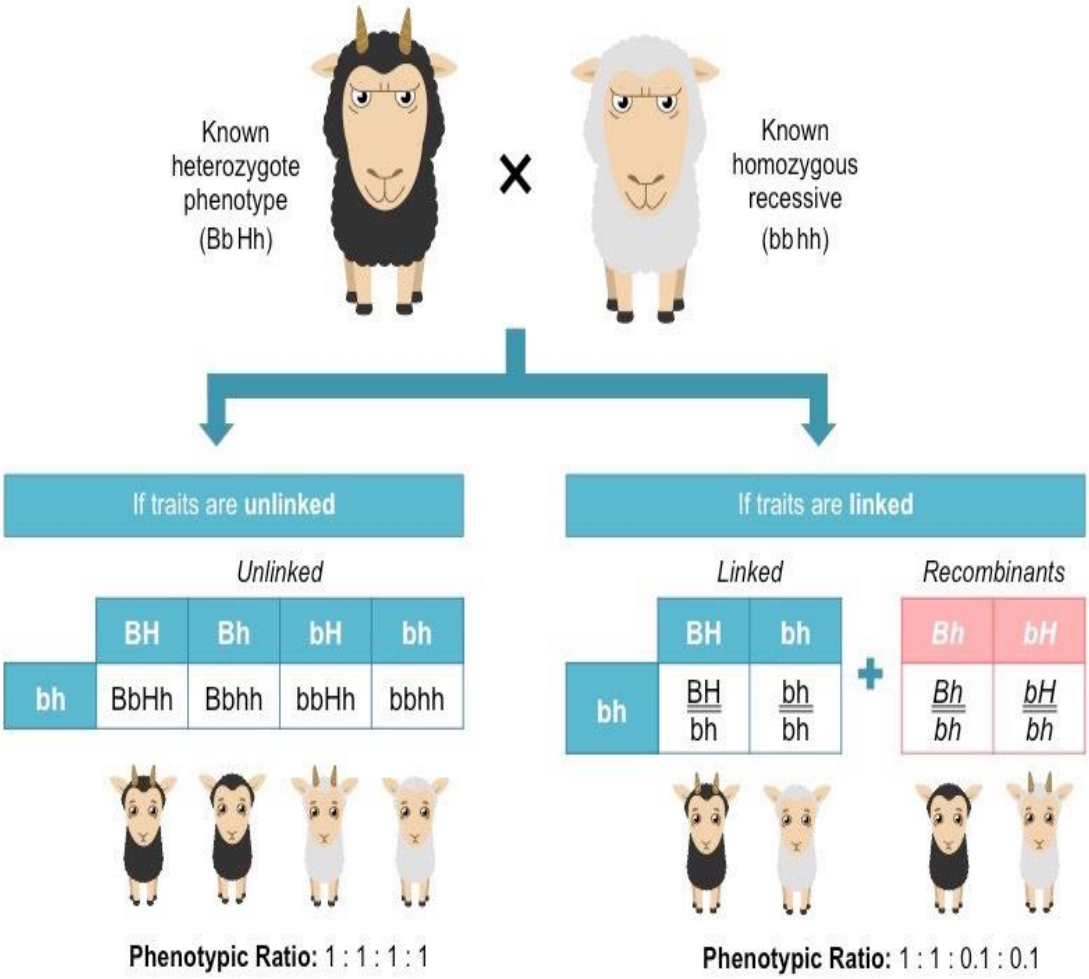
- If the unknown parent is homozygous dominant, all offspring will express the dominant phenotype.
- If the unknown parent is heterozygous, half the offspring should be dominant and half recessive.



Testing for Gene Linkage

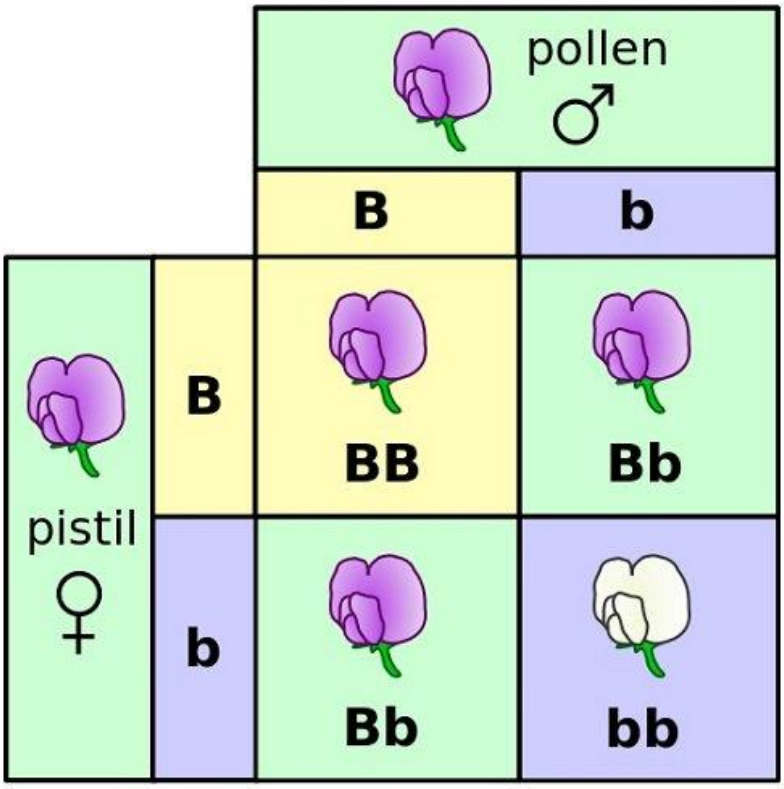
Test crosses can also be used to determine if two genes are linked or unlinked by mating with a known heterozygote

- If there is an equal ratio of the four potential phenotypes, the two genes are likely unlinked (independent assortment).
- If there are two phenotypes in high amounts and two phenotypes in low amounts (recombinants), the two genes are likely linked.



Monohybrid Crosses

Mendel found that reproduction between two heterozygous monohybrid individual (Tt) results in both dominant and recessive phenotypes among the offspring. The phenotype ratio among the offspring was **3:1** three of the offspring were dominant and one was recessive and then Mendel realized that these results can't be obtained only if alleles segregate during Meiosis. And he used the **Test cross** to determine whether or not the dominant trait has two identical factors or not.



Exercises

1- A man with Brown eyes (his father eyes were blue) marries a women with blue eyes what is the proportion of children would be expected have blue eyes? (Brown color is dominant).

2- A right handed man marries a left handed women and produce left handed children (right hand is dominant).

3- A mating between *Drosophila* fly wild type and dumpy winged fly, what are the possible results of this mating?