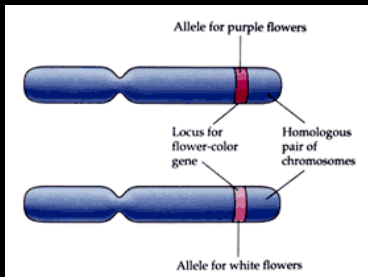


# Allele numbers & frequencies

## Definitions

- Allele number
  - Number of unique DNA sequences at a locus
- Allele frequency
  - Relative frequency of a specific sequence at any given locus in a population
  - Calculated using HWE =  $p^2+2pq+q^2$  (Jennifer)



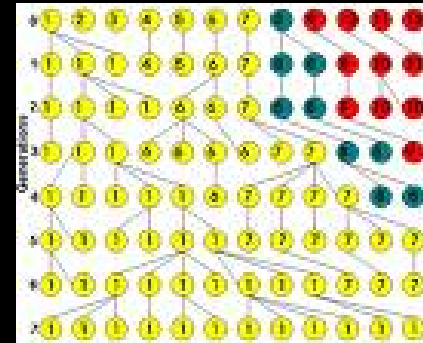
$p$  = frequency of allele 1

$q$  = frequency of allele 2

# Allele numbers & frequencies

Why is it important?

- Allele frequency measures genetic diversity
  - Can provide insights into the
    - Likelihood of genetic drift
    - Evolutionary potential
    - Inbreeding (F stats - Elizabeth)
- Can be affected by selection, population size, mutation, migration, genetic drift, demographic stochasticity





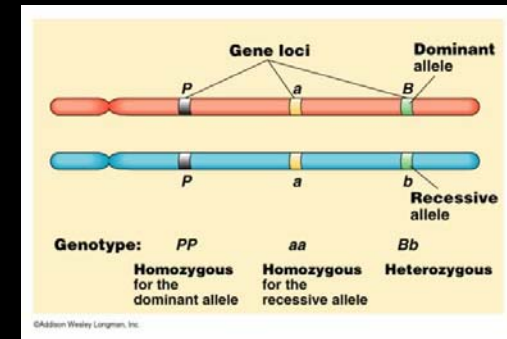
# Polymorphism

Why is it important?

- Provides information on
  - Potential for genetic drift
  - Genetic diversity/variation
  - “Health” of an individual/population/species (Specifically at MHC loci and inbreeding coefficients)



# Heterozygosity



## Definition

- Percent of individuals with more than one allele at a given locus

$H$  = percent heterozygotic individuals at a locus

$\bar{H}$  = percent individuals that are heterozygotic across loci

- Ex: 10 loci with  $H_1 = 0.2$ ,  $H_2 = 0.3$ ,  $H_3 = 0.4$ , and all other  $H = 0$  will give a  $\bar{H} = [0.2 + 0.3 + 0.4 + 7(0)] / 10 = .09$

## Calculated using

- HWE ( $2pq$ )

# Heterozygosity

## Why is it important?

- Once again....Gives important insight into the “health” of a population or species using
  - F stats (Elizabeth)
- Provides information about the mating system
- Could be used to calculate  $N_e$ 
  - $N_e$  the size of an ideal population given the observed inbreeding and genetic drift in a real population
  - However, not always accurate...use with caution