

Knowledge-based Learning Outcomes

Upon completion of *Sickle-Cell Alleles (WB)*, students should be able to:

1. Describe the meaning of allele frequency.
2. Describe in general terms the mechanism of natural selection.
3. Describe in general terms the mechanism of genetic drift.
4. Demonstrate an understanding of how changes in an allele's frequency depend on selection strength, population size, and the initial number of carriers of that allele.

Skills-based Learning Outcomes

Upon completion of *Sickle-Cell Alleles (WB)*, students should be able to:

1. Calculate the frequency of one allele in a two-allele system given the frequency of the other allele (i.e. demonstrate understanding that allele frequencies add up to 1.)
2. Use the Hardy-Weinberg equation to calculate the expected frequency of each genotype in a two-allele system, given the frequency of one allele.
3. Predict how frequencies of genotypes and alleles will change under different environmental conditions when there is a heterozygote advantage.