**Hardy-Weinberg practice questions**

1. Sickle-cell anemia is a genetic disease. The Sickle-cell allele is recessive, but individuals with the homozygous recessive genotype (ss) often die prematurely due to the disease. This affects approximately 9% of the population in Africa. Use the Hardy-Weinberg equations to calculate the following:
   1. The frequency of the recessive allele in the population (q).
   2. The frequency of the dominant allele in the population (p).
   3. The frequency of homozygous dominant individuals in the African population.
   4. The frequency of heterozygous individuals in the African population.
2. Within a population of butterflies, the color brown (B) is dominant over the color white (b). And, 40% of all butterflies are white. Given this simple information, which is something that is very likely to be on an exam, calculate the following:
   1. The percentage of butterflies in the population that is heterozygous.
   2. The frequency of homozygous dominant individuals.
3. A very large population of randomly-mating laboratory mice contains 35% white mice. White coloring is caused by the double recessive genotype, "aa". Calculate allelic and genotypic frequencies for this population.

*Applying the 5 conditions of Hardy-Weinberg equilibrium, determine if the following are evolving or are in H-W equilibrium. Justify your answer*

Pink spotted dragons are dominant to purple striped dragons. Female dragons, no matter their phenotypes, prefer males that have pink spots. In the female's opinion, the bigger the spots on a potential mate, the better, and the more likely she is to choose him as a mate.

*Over time, will this population demonstrate Hardy-Weinberg equilibrium? Why or Why not?*

Dandelions are flowers that have seeds that are easily dispersed by the wind. Children and whimsical folk often make wishes while blowing on these seeds, although gardeners despise this plant because it is a rather aggressive weed. These weeds have several adaptations that have helped them to become so prominent. For one, they have deep taproots with an amazing ability to regenerate as well as thorns on their leaves, preventing humans from effectively "pulling" this weed. Another adaptation that they have are very flat leaves that are low to the ground, which allows them to avoid lawnmower blades.

*Over time, will this population demonstrate Hardy-Weinberg equilibrium? Why or Why not?*