**Hardy-Weinberg**

**Easiest Ones**

1. In the population of bats, long wings are dominant to short wings. If 20% of the population has short wings, then what is the frequency of the recessive allele?
2. In guinea pigs, black hair is dominant over white hair. If 15% of the population has white hair, then what is the frequency of the dominant allele?
3. What is the allele frequency of the recessive allele if 40% of the population shows the dominant allele?
4. 372 turtles express the dominant phenotype in a population of 7,329. What is the frequency of the dominant trait in the population?
5. If the frequency of the dominant allele is 0.5 in a population of sea squirts, then what is the frequency of the homozygous dominant genotype?

**Getting Harder…**

1. If 32% of the population shows the recessive phenotype, then how many individuals in a population of 550 show the heterozygous genotype?
2. In fruit flies the allele for normal size wings is dominant to the allele for vestigial wings. In a population of 1000 individuals, 360 show the recessive phenotype. Calculate the number of individuals you would expect to be homozygous dominant **AND** the number of individuals that would be heterozygous for this trait.
3. The allele for unattached earlobes is dominant over the allele for attached earlobes. In a population of 500 individuals, 25% show the recessive phenotype. How many individuals would you expect to be homozygous dominant **AND** how many individuals would you expect to be heterozygous?
4. 1 in 1700 US Caucasian newborns have cystic fibrosis. Normal is dominant over cystic fibrosis. What are the allele frequencies and genotype frequencies of the population for cystic fibrosis?

**Toughies**

1. In Oompa Loompas, blue skin is dominant to orange. In a population of 4,573 Oompa Loompas, 790 of the blue-skinned individuals were determined to only have blue skin alleles. How many heterozygous Oompa Loompas are present in the population?
2. In a certain population the dominant phenotypeof a certain trait occurs 91% of the time. What is the frequency of the dominant allele?

**Ready for a REAL challenge??**

1. In a population of 2000 individuals, 3200 of the alleles held by them are dominant. How many of these individuals are **carriers**?
2. It has been found that a carrier of cystic fibrosis is better able to survive diseases with severe diarrhea. What would happen to the frequency of the "a" (cystic fibrosis allele) if there was an epidemic of cholera or other type of diarrhea producing disease?

Would "a" Increase or would it Decrease? Why?