MORE HARDY-WEINBERG PROBLEMS
THAN YOU CAN SHAKE A STICK AT!

1. In a certain flock of sheep, 4% of the population has black wool and 96% has white wool. If black wool is a recessive trait, what percent of the population is heterozygous for this trait? Assume that the population is in Hardy-Weinberg equilibrium.

2. In certain Native American groups, albinism due to a homozygous recessive condition in the biochemical pathway for melanin is sometimes seen. If the frequency of the allele for this condition is .06, what is the frequency of the dominant allele in this population? Assume that the population is in Hardy-Weinberg equilibrium.

3. In a certain group of rabbits, the presence of yellow fur is the result of a homozygous recessive condition in the biochemical pathway producing hair pigment. If the frequency for this allele for this condition is .10, what is the frequency of the dominant allele in this population? Assume that the population is in Hardy-Weinberg equilibrium.

4. In a population of squirrels, the allele that causes bushy tail (B) is dominant, while the allele that causes bald tail is recessive (b). If 64% of the squirrels have a bushy tail, what is the frequency of the dominant allele? Assume that the population is in Hardy-Weinberg equilibrium.

5. In a Hardy-Weinberg population with two alleles, A and a, that are in equilibrium, the frequency of the allele a is .7. What is the percentage of the population that is homozygous for this allele?
6. In a Hardy-Weinberg population with two alleles, A and a, that are in equilibrium, the frequency of the allele a is .7. What is the percentage of the population that is heterozygous for this allele?

7. In a population with two alleles for a particular loci, E and e, the allele frequency of E is .6. What would the frequency of heterozygotes be if the population is in Hardy-Weinberg equilibrium?

8. In a Hardy-Weinberg population with two alleles, A and a, that are in equilibrium, the frequency of the allele a is .2. What is the percentage of the population that has the Aa genotype?

9. In a Hardy-Weinberg population with two alleles, A and a, that are in equilibrium, the frequency of the allele a is .2. If this population had 240 individuals, how many would express the dominant trait?

10. In a Hardy-Weinberg population with two alleles, A and a, that are in equilibrium, the frequency of the allele a is .5. What is the percentage of the population that expresses the dominant trait?

11. In a hypothetical population of 1000 people, tests of blood-type genes show that 160 people have the genotype AA, 480 have the genotype AB and 360 have the genotype BB. What is the frequency of the A allele?

12. In a population that is in Hardy-Weinberg equilibrium, 9% of the individuals show the recessive trait. What is the frequency of the dominant allele in the population?
13. In peas, a gene controls flower color such that \( R = \) purple and \( r = \) white. In an isolated pea patch, there are 36 purple flowers and 64 white flowers. Assuming Hardy-Weinberg equilibrium, what is the frequency of the purple allele (\( R \)) in this population?

14. At a locus with a dominant and a recessive allele in Hardy-Weinberg equilibrium, 84% of the individuals express the dominant trait. What is the frequency of the dominant allele in the population?

15. If the frequency of two alleles in a gene pool is 20% D and 80% d, what is the frequency of individuals with the genotype Dd?

16. In humans, attached ear lobes are caused by inheritance of 2 recessive genes. Free ear lobes are the result of inheriting at least one dominant gene for free ear lobes. The frequency of the recessive gene is 70%. What would the frequencies of the following be?
   a. RR_____
   b. Rr_____
   c. rr_____
   d. R_____ 
   e. r_____

17. From the previous question, how many people in a population of 7,000 would carry the allele for free ear lobes?
18. A population has 25% recessive homozygotes. The frequency of the homozygous dominant genotype should be what number if in Hardy-Weinberg equilibrium?

19. A new species of ant is discovered in Costa Rica. Most of the ants have a bright green stripe across their head. Magnus Phangus, a famous French entomologist studying the ants has determined that ants with the Gg or GG genotype have a green stripe on their heads and those with the gg genotype do not. A population of 1000 ants is discovered. Dr. Phangus counts 430 ants with a green stripe and 570 ants without a green stripe. What is the frequency for each genotype in this population assuming the population is at genetic equilibrium?

20. In a population of 3000 fruit flies, 270 of them contain white eyes which are a recessive trait. What are the allelic frequencies for the red eye allele and the white eye allele? What percent of the population will be heterozygous red?
A population in Hardy-Weinberg equilibrium is about as real as a unicorn.