

**INS Biology Homework Week 4**

**NAME:** \_\_\_\_\_

**Due Wednesday, October 17**

Your responses should be relatively brief, providing only the necessary information to answer the question.

1. Construct a version of the Hardy-Weinberg equations that could be applied to a gene with three alleles.
2. Imagine an allele that is present at a frequency of 0.5 in a large population and in a small population. Compare and contrast the effects of genetic drift on this allele in the two populations.
3. For a species of mongoose (a weasel like mammal), tail coloration is controlled by a single gene with two alleles, a recessive “ring stripe” allele and a dominant “black tip” allele. You examine a population of 200 individuals and find the frequency of the “ring stripe” allele to be 0.3. If the population is in Hardy-Weinberg equilibrium, how many individuals with each genotype would you expect?
4. While studying a population of fruit flies, you notice a new mutation that causes a fly to grow a second set of wings. You are interested in investigating the effects of this mutation on fitness. Propose a hypothesis and null hypothesis, and design an experiment to test the hypotheses. Assume you have enough flies to perform your experiments.

**Across**

2. Changes in the genetic material; creation of new alleles
4. Producing offspring with a close relative
6. Favors the extreme values over the mean but does not alter that value
11. Weeds out the extreme values of a trait but does not alter the mean value
12. Results in having male-male competition
13. Streamlined bodies in fish, whales, and seals are an example of this
14. The proportion of the gene that an allele exists in a population
16. Lamarck and Darwin's contribution to Biology
17. Process by which streamlined bodies in fish, whales, and seals evolved into similar forms
18. Affects small populations strongest
20. Loss of heterozygosity as a result of extensive reproduction by close relatives with each other
21. Difference between male and female investment in reproduction
22. When only one copy of a gene exists as a result of genetic drift

**Down**

1. Sampling error caused by a certain type of movement of individuals from one population to another
3. Results in present day domestic plants and animals
5. Male and female peacocks are examples of this
7. Fur in mammals is an example of this
8. Usually follows a population bottleneck
9. Darwin's original idea in evolutionary theory
10. Leads to the mean value of a trait getting bigger or smaller
15. When only one copy of a gene exists as a result of genetic drift, what happened to the other copies
19. Movement of individuals from one population to another

