Allele frequencies and population variation
BIOL 01104 Spring 2020
Dr. Spielman

1. You are studying a population of newts who have a particular gene that gives them sticky feet. Individuals with genotype FF have very sticky feet, Ff have mildly sticky feet, and ff do not have sticky feet. In this population, there are 100 FF's, 145 Ff's, and 85 ff's.
    a. What is the frequency of allele "F"? This is *p*.

    b. What is the frequency of allele "f"? This is *q.*

    c. What is the sum of p and q? Does this make sense?

    d. What is the heterozygosity of this population?

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2. You are studying a population of sparrows. Those with genotype BB and Bb both have grey tail feathers, and bb have white tail feathers. There are 100 sparrows: 37 BB individuals, 45 Bb, and 18 bb.
    a. What is *p* in this population for the B/b gene?

    b. What is *q* in this population for the B/b gene?

    c. What is the heterozygosity of this population?

    d. What is the proportion of individuals in the population with grey tail feathers?

    e. You return to the population of sparrows in the next generation. You find there are 65 BB individuals, 25 Bb, and 10 bb. Do you think the population is evolving? *Consider the definition of evolution!*

    f. If the population is indeed evolving, assume natural selection is acting: Any guesses which genotype and/or phenotype is the most fit? Then, which ALLELE is the most fit?