

Evolution of Populations

Modeling a Gene Pool

Introduction

A population is a group of organisms of the same species that live together in a particular location. Each population is normally isolated from other populations of the same species. Populations can be observed for many characteristics.

Population genetics is the study of genes in a population of organisms. Biologists who study population genetics are interested in how frequently alleles of a gene appear in a population. Biologists are also interested in any changes in gene frequencies that may be occurring.

In this investigation beans will be used to represent individuals in a simulated population of organisms. Red beans will be symbols for homozygous dominant individuals RR . Pink (pinto) beans will be symbols for heterozygous individuals Rr . White beans will be symbols for homozygous recessive individuals rr . You will study various crosses using the beans and analyze frequencies and frequency changes as they appear in a simulated population in which a harmful phenotype occurs. In addition to this, you will be able to see how a potentially lethal genetic disorder affects allele frequency in the population over generations.

Problem

How does gene frequency change in a population of organisms?

Pre-Lab Discussion

Read the entire investigation. Then work with a partner to answer the following questions.

1. Why are you asked to set aside and not use some of the white beans at the start of the experiment?

2. If the initial breeding population (the parent generation) is composed of 16 RR individuals, 32 Rr individuals, and 8 rr individuals, how many R alleles are present in the parent generation? How many r alleles are present in the parent generation?

3. For the individuals in this lab, can the genotype of each be determined from the phenotype? Explain your answer.

Modeling A Gene Pool Lab Answers

J Ma



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