

Pazmo Bugs: An Old-Fashion Paper Simulation for a Modern Genetics Lab

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Inspired by fruit flies, this original simulation has been used successfully in biology labs for nearly 25 years to help teach and illustrate a variety of concepts related to genetics. The simulation simultaneously tracks genotype and phenotype of 12 Mendelian traits through successive generations. The simulation consists of two phases: (1) data collection and (2) data analysis. During data collection, working in small groups, each student generates a unique population of pazmo bugs through mating; genotype, phenotype, and parents are known for each individual of the population. Data can be easily analyzed at four different population levels - individual student populations, small group populations, lab section populations, and/or entire course population. Concepts routinely illustrated using the mating procedure and through data analysis include meiosis and gamete formation, independent assortment, effects of population size and inbreeding on allele frequencies, natural selection, and pedigrees. The simulation is adaptable and can be modified slightly to illustrate other concepts as well. This simulation is an effective teaching tool. It is interactive, involves multiple modalities, allows students to get results in real time, and gives students an opportunity to work with a large data set. Further, students can "see" how the processes work. Because of its simplicity and breadth, this simulation is generally the first thing done in the genetics portion of our lab. Afterwards, it serves as a point of reference or foundation for introducing additional or more advanced concepts

Keywords: pazmo bugs, genetics simulation

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