Student Exploration: Hardy-Weinberg Equilibrium

Vocabulary: allele, genotype, Hardy-Weinberg equation, Hardy-Weinberg principle, heterozygous, homozygous, Punnett square

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)
Suppose the feather color of a bird is controlled by two **alleles**, D and d. The D allele results in dark feathers, while the d allele results in lighter feathers.

 Suppose two Dd birds mate. What percentages of DD, Dd, and dd offspring would you predict? Use the **Punnett square** at right to help determine your answer.

DD: 25% Dd: 50% dd: 25%

In this situation, what ratio of heterozygous (Dd) to homozygous (DD and dd) offspring

would you expect to find? 1:1 ratio of heterozygous (Dd) to homozygous (DD and dd).

Gizmo Warm-up

Many factors—immigration, natural selection, hunting, and so forth—can influence the composition of a population. To determine if one of these factors is affecting a population, it is useful to know what a population looks like when none of these factors is present.



In 1908, Godfrey Hardy and Wilhelm Weinberg independently discovered the laws that govern such populations. These laws can be explored in the Hardy-Weinberg Equilibrium Gizmo™.

The parrots you see on the SIMULATION pane represent a larger population of 500 parrots.
 Select the TABLE tab. How many parrots of each genotype are in the initial population?

DD: 250 parrots De

Dd: 100 parrots

dd: 150 parrots

Return to the DESCRIPTION tab. Click Begin, and then click Breed. What happens?

The birds reproduce, making eggs.

Click Hatch, and look on the TABLE tab. What are the parrot populations now?

DD: 178

Dd: 248

dd: 78

Hardy Weinberg Equilibrium Gizmo Answers

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