

Quick Lab

Testcross 12.3

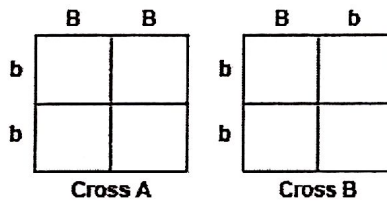
When genotypes are known, Punnett squares can be used to predict phenotypes. But can genotypes be determined if only phenotypes are known?

Suppose a breeder has a rabbit that has a dominant phenotype, such as black fur (as opposed to recessive brown fur). How could the breeder know whether the rabbit is homozygous (BB) or heterozygous (Bb) for fur color? The breeder could perform a testcross.

A *testcross* is used to test an individual whose phenotype for a characteristic is dominant but whose genotype is not known. This individual is crossed with an individual whose genotype is known to be homozygous recessive. In our example, the breeder would cross the black rabbit (BB or Bb) with a brown rabbit (bb).

Procedure

On a separate sheet of paper, copy the two Punnett squares shown here. Write the appropriate letters in the boxes of each square.



Analysis

1. Label what each pair of letters represents in each of the Punnett squares.

2. Identify which figure represents a testcross involving a heterozygous parent.

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Testcross continued

3. **Identify** which figure shows a cross in which all offspring will have black fur.

4. **Critical Thinking Applying Models** If half of the offspring in a testcross have brown fur, what is the genotype of the parent that has black fur?
