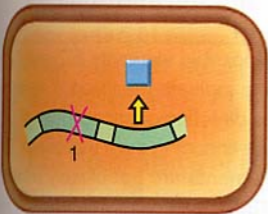
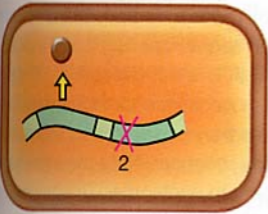


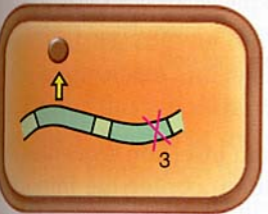
Wild-type cell: both genes are functional and cell is  $\text{Trp}^+$



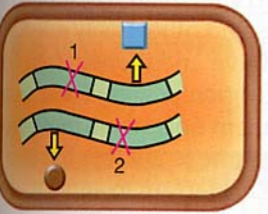
Mutant X: cell contains mutation 1 and is  $\text{Trp}^-$  (requires tryptophan for growth)



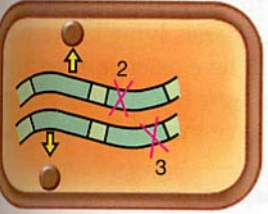
Mutant Y: cell contains mutation 2 and is  $\text{Trp}^-$



Mutant Z: cell contains mutation 3 and is  $\text{Trp}^-$



Trans test of mutations 1 and 2: complementation occurs (cell is  $\text{Trp}^+$ ), therefore mutations are in separate genes



Trans test of mutations 2 and 3: no complementation occurs (cell is  $\text{Trp}^-$ ), therefore mutations are in the same gene

**Figure 10.27** Complementation analysis. The protein products of both genes (A and B) are required to synthesize tryptophan. Mutations 1, 2, and 3 each lead to the same phenotype, a requirement for tryptophan. Complementation analysis indicates that mutations 2 and 3 are in one gene and that mutation 1 is in another.