EXAMPLE 2 **Perform a simulation using technology**

GAME CARDS You receive a game card with every purchase at a sandwich shop. Each card has two circles to scratch. One circle reveals a prize, and the other says "Not a Winner." You cannot claim a prize if you scratch both circles. There is a $\frac{1}{6}$ chance that a card is for a CD, a $\frac{1}{2}$ chance that it is for a drink, and a $\frac{1}{3}$ chance that it is for a sandwich. About how many game cards must you scratch before you win a CD?

Solution

STEP 1 **Use** List 1 to show whether you scratch the circle with the prize. Generate a list of 50 random 1s and 0s. Each 1 means that you scratch the circle with the prize, and each 0 means that you scratch "Not a Winner."

Press **STAT** and select Edit. Highlight L_1. Enter randInt(0,1,50).

STEP 2 **Use** List 2 to show whether your game card contains the CD as the prize. Generate a list of 50 random integers from 1 to 6. Each 1 represents a prize card with a CD.

Highlight L_2. Enter randInt(1,6,50).

STEP 3 **Compare** the results of your two lists using List 3. Multiply the numbers from List 1 and List 2. Each 0 in List 3 means that you chose the wrong circle, so the prize does not matter. Because $1 \cdot 1 = 1$, you chose the correct circle *and* your card contains the CD prize when you see a 1 in L_3.

Highlight L_3. Enter L_1*L_2.

STEP 4 **Find** the first occurrence of a 1 in List 3. In this simulation, you can see that the first occurrence of a 1 in List 3 happens after 4 trials.

▶ For this simulation, you must scratch 4 game cards before you win a CD.

PRACTICE

1. In Example 1, suppose you can receive a prize coupon for nachos in addition to the items listed in the example. About how many times must you buy an item from the concession stand before you win each prize at least once? *Explain* how you found your answer.

2. In Example 2, about how many game cards must you scratch before you win one of each prize? *Explain* how you found your answer.

3. In Example 2, there are 3 prizes. *Explain* why the results of the simulation would be inaccurate if you generated random integers from 1 to 3.