

# Graphing Technology Lab

## Probability Simulation

Sharp EL-9900C

A simulation is an experiment that is designed to act out a given situation. You can use a random number generator on a Sharp EL-9900C graphing calculator to create data for the experiment. Repeating a simulation may result in different probabilities since the numbers generated are different each time.

### ACTIVITY

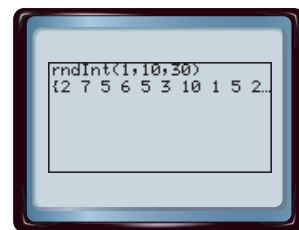
Generate 30 random numbers from 1 to 10, simulating selecting a card from cards numbered 1 through 10 and replacing a card after it is drawn.

- Access the random number generator from the calculation screen.
- Enter 1 as a lower bound and 10 as an upper bound for 30 trials.

**KEYSTROKES:** **MATH** C: **PROB 2:** **rndInt**( 1 , 10 , 30 ) **ENTER**

Use the left and right arrow keys to see all the numbers.

Record all 30 numbers in a column on a separate sheet of paper.



### Analyze the Results

1. Record how often each number from 1 to 10 appeared.
  - a. Find the experimental probability of each number.
  - b. Compare the experimental probabilities with the theoretical probabilities.
2. Repeat the simulation of selecting 30 cards. Record this second set of numbers in a column next to the first set of numbers. Each pair of 30 numbers represents selecting two numbers. Find the sum for each of the 30 pairs of cards.
  - a. Find the experimental probability of each sum.
  - b. Compare the experimental probabilities with the theoretical probabilities.
3. Design an experiment to simulate 30 spins of a spinner that has equal sections labeled A, B, C, and D.
  - a. Find the experimental probability of each letter.
  - b. Compare the experimental probabilities with the theoretical probabilities.
4. Suppose you play a game where there are three containers, each with ten balls numbered 0 to 9. Pick three numbers and then use the random number generator to simulate the game. Score 2 points if one number matches, 16 points if two numbers match, and 32 points if all three numbers match. (Note: numbers can appear more than once.)
  - a. Play the game if the order of your number *does not* matter. Total your score for 10 simulations.
  - b. Now play the game if the order of the numbers *does* matter. Total your score for 10 simulations.
  - c. With which game did you score more points?

