



Graphing Calculator Investigation

A Follow-Up of Lesson 6-9

Probability Simulation

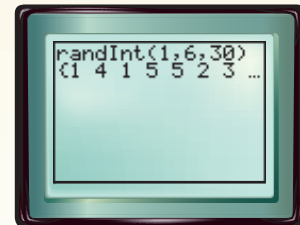
A random number generator can simulate a probability experiment. From the simulation, you can calculate experimental probabilities. Repeating a simulation may result in different probabilities since the numbers generated are different each time.

Example Generate 30 random numbers from 1 to 6, simulating 30 rolls of a number cube.

- Access the random number generator.
- Enter 1 as a lower bound and 6 as an upper bound for 30 trials.

KEYSTROKES: $\boxed{\text{MATH}}$ $\boxed{\leftarrow}$ $\boxed{5}$ $\boxed{1}$ $\boxed{,}$ $\boxed{6}$ $\boxed{,}$ $\boxed{30}$ $\boxed{)}$ $\boxed{\text{ENTER}}$

A set of 30 numbers ranging from 1 to 6 appears. Use the right arrow key to see the next number in the set. Record all 30 numbers, as a column, on a separate sheet of paper.



Exercises

1. Record how often each number on the number cube appeared.
 - a. Find the experimental probability of each number.
 - b. Compare the experimental probabilities with the theoretical probabilities.
2. Repeat the simulation of rolling a number cube 30 times. Record this second set of numbers in a column next to the first set of numbers. Each pair of 30 numbers represents a roll of two number cubes. Find the sum for each of the 30 pairs of rolls.
 - a. Find the experimental probability of each sum.
 - b. Compare the experimental probability with the theoretical probabilities.
3. Design an experiment to simulate 30 spins of a spinner that has equal sections colored red, white, and blue.
 - a. Find the experimental probability of each color.
 - 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 numbers *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 rules did you score more points?

