10.6 Create a Binomial Distribution

TEKS *a.1, a.5*

**QUESTION** **How can you use a graphing calculator to calculate binomial probabilities?**

Some calculators have a binomial probability distribution function that you can use to calculate binomial probabilities. You can then use the calculator to draw a histogram of the distribution.

EXAMPLE **Calculate binomial probabilities**

TV NEWS According to a survey, 38% of U.S. adults get their news primarily from television. Suppose you survey 6 adults at random. Draw a histogram of the binomial distribution showing the probability that television is the primary news source for exactly k adults. What is the most likely number of adults in your survey who get their news primarily through television?
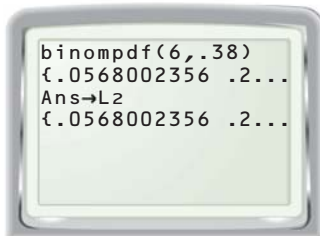
STEP 1 *Enter values of k*
Let $p = 0.38$ be the probability that television is a person's primary news source. Enter the k-values 0 through 6 into list L_1 on the graphing calculator.
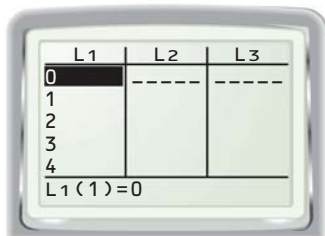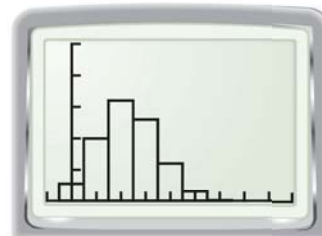
STEP 2 *Find values of P(k)*
Enter the binomial probability command to generate $P(k)$ for all seven k-values. Store the results in list L_2.

STEP 3 *Draw histogram*
Set up the histogram to use the numbers in list L_1 as x-values and the numbers in list L_2 as frequencies. Draw the histogram in a suitable viewing window.

From the histogram in Step 3, you can see that $k = 2$ is the most likely number of the 6 adults surveyed who get their news primarily through television.

PRACTICE

A binomial experiment consists of n trials with probability p of success on each trial. Use a graphing calculator to draw a histogram of the binomial distribution that shows the probability of exactly k successes. Then find the most likely number of successes.

1. $n = 12, p = 0.29$ 2. $n = 14, p = 0.58$ 3. $n = 15, p = 0.805$

4. **WHAT IF?** In the example, how do your histogram and the most likely number of adults change if you survey 14 adults at random?