



In these activities you will use frequency and relative frequency to analyze distributions of jellybeans. After completing the activities, discuss and/or present your findings to the rest of the class.



Activity 1 [Page 1.3]

1. The set of all possible outcomes from a chance experiment is called the sample space for that experiment.
 - a. What is the sample space for drawing a jellybean from the bag?
 - b. Are the outcomes for each color equally likely? Why or why not?
 - c. Reset and select Bar Graph. The graph shows a *frequency* distribution. Draw jellybeans until you have 50. Make a sketch of your results. Which color had the greatest frequency? The least?
 - d. Reset and draw another 50 jellybeans. How does this frequency distribution compare to the one from question c above?



Activity 2 [Page 1.5]

1. On page 1.5 draw 10 jellybeans.
 - a. Explain what the top and bottom graphs represent. Use the distribution of the jellybean colors to support your answer. Note that moving the cursor over a bar displays information about what the bar represents.



- b. The proportion or percent of jellybeans that are each color is called the *relative frequency* for that color. Explain how the relative frequency is different from just the frequency.
- c. Suppose Adam had a distribution of the colors with 50 jellybeans, 18 of which are blue and Bethany had a distribution of the colors with 75 jellybeans, 25 of which are blue. Whose distribution had the greater relative frequency of blue jellybeans?
- d. Think about drawing 50 and then drawing 100 jellybeans. Why is the concept of “relative frequency” important?
2. Remember experimental probability from Activity 12, *What is Probability?* You can use the long run relative frequency of an outcome to estimate the probability of that outcome. (Note this is sometimes written as $P(\text{outcome})$.)
- a. Use your results to estimate the probability of getting a purple jellybean.
- b. Draw 40 more jellybeans for a total of 50. How did your estimated probability for getting a purple jellybean from above change?
- c. In a sample of 50 jellybeans, the estimate for $P(\text{blue}) = 0.15$, $P(\text{orange}) = 0.09$, $P(\text{green}) = 0.12$, $P(\text{purple}) = 0.35$. What is an estimate for $P(\text{yellow})$ and how do you know?



Activity 4 [Page 2.2]

1. Draw 10 jellybeans and enter the observed frequency of each jellybean color in the first row of the table. (Note: Each repetition consists of exactly 10 jellybeans.) Reset and draw a new set of ten jellybeans. Record the frequency of each color in the table. Fill in the table using the same process.

repetition	yellow	orange	purple	green	blue

- a. Which of the samples you drew might be misleading about the proportion of colors for the jellybeans? Explain your reasoning.
- b. Based on your results in the table, do you think this is the same bag of jellybeans used on page 1.3? Why or why not?