

Student Activity

Name	
Class	

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.



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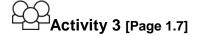
- b. The proportion or percent of jellybeans that are each color is called the *relative frequency* for that color. Explain how the relative frequency is different from just the frequency.
- c. Suppose Adam had a distribution of the colors with 50 jellybeans, 18 of which are blue and Bethany had a distribution 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*(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(blue) = 0.15, P(orange) = 0.09, P(green) = 0.12, P(purple) = 0.35. What is an estimate for P(yellow) and how do you know?



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- 1. Seth wrote out the list below of the things he learned in this lesson. What would you say to Seth? Use an example from the TNS activity to support your advice.
 - a. "A sample of about 20 will give you a fairly good idea about the distribution of the outcomes of an experiment (like the colors of jellybeans when you drawing them out of a bag)".
 - b. "The outcomes of a chance process do not all have to have the same chance of occurring (be equally likely)".
 - c. "The frequency of an outcome and the relative frequency of the same outcome are the same thing."
 - d. "After drawing lots and lots of jellybeans, the relative frequency of each color jellybean got closer and closer to the actual proportion of each color in the bag."



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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?