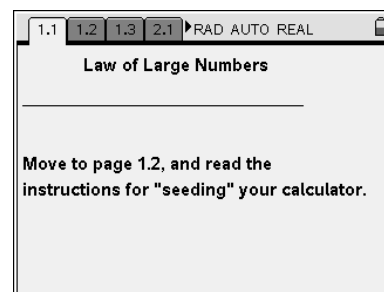



This lesson involves the investigation of comparing the expected probability to the observed probability for various numbers of events.



- **Open the TI-Nspire document *Law\_of\_Large\_Numbers*.**
- **Press  and move to page 1.2 to seed your calculator prior to beginning the lesson.**
- **After completing the “seeding” on page 1.3, move to page 2.1 to begin the lesson.**

*You need only click on either of the arrows for the slider **Draw** on page 2.1 to add samples to the plot. Each click is one more sample.*

Consider a bag of blocks, each of which is labeled with a different number. This activity explores what happens when you randomly select a single block from the bag, note its label (number), and put it back into the box. As you begin, you do not know how many blocks of each type are in the bag; however, you do know that the expected probability of drawing a block labeled with a 4 is 0.3.

1. The plot on page 2.1 represents the result of selecting one block from the bag and recording the number it is labeled with.

The first draw is already shown. How does the observed probability compare to the expected probability?

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2. Click the up arrow on the slider nine times (so that a total of exactly 10 outcomes are displayed). How did the difference in probability at the bottom of the screen change as the number of draws increased?

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- **Move to page 2.2.**

3. The scatter plot shows the differences of probability vs. the number of draws. Describe the pattern of the scatter plot.

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4. How does the scatter plot support your answer from Question 2?

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5. Move back to page 2.1. Continue to click the slider until you have generated a distribution that has 50 sample elements. View the scatter plot again. (You may need to adjust the plot to see all 50 draws.) This plot demonstrates the law of large numbers. Explain in your own words the definition of the law of large numbers.

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