Distracted Driver Activity

Is talking on a cell phone while driving more distracting than talking to a passenger?

In this activity, you will be using the Nspire, instead of a deck of cards to see how likely the results of David Strayer's and his colleagues' experiment to answer the question. The results are given below:

		Distraction	
		Cell phone	Passenger
Stopped at rest area?	Yes	12	21
	No	12	3

Are these results statistically significant? Or could these results have occurred because more of the typically "distracted" drivers happened to be in the cell phone group?

To answer this question, we will explore what would happen by chance if the 48 undergraduate students in this experiment were randomly reassigned to the treatment groups, *under the assumption that the treatment does not affect whether a driver stops at the rest area.*

1. Create a new document. Press ctrl N and select *Add Lists & Spreadsheet*.

2. Name column A: **driver**. Press enter twice and enter the formula **seq*(x,x,1,48)*.** Press enter and the numbers 1 – 48 should now fill the column.

We will now randomly select 24 subjects for each group and record how many within the 24 missed the rest stop. Since there 15 subjects altogether that missed the exit, let **1 - 15** represent a "distracted" driver. The first set of 24 numbers will represent the *Cell phone* group.

3. Name column B: **cell_phone**. Press enter twice and enter the formula **randSamp*(*driver,*24,1)*.** This command randomly selects *without replacement* 24 subjects. Now count how many numbers are less than 15 in this list.

Was your number 12 or more? Compare your result with the rest of the class. Based on the results, what can we conclude?

(S)(T)(A)(T)(I)(S)(T)(I)(C)(S) with the TI*nspire*

The Nspire can quickly give you a clear picture about the possibility of 12 out of the 15 distracted drivers being in the *Cell Phone* group just by chance. This is done by using the *CountIf* and *Data Capture* functions along with *RandSamp*.

4. Arrow the first cell in column D. Type **celldistract** [:=] **CountIf (randSamp(driver, 24, 1), ? < 15)**. This variable represents the number of distracted drivers who used cell phones within a group of 24 randomly selected drivers.

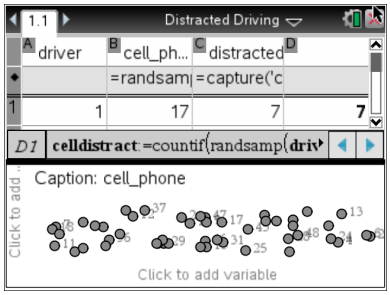
5. Arrow the top of column C and name this list: **distracted**.

   - Arrow to the formula cell and press (menu), *Data, Data Capture, Automated*.
   - Press (var) and select **celldistract.**
   - Press (enter) and this list is ready to capture the number of distracted drivers in the cell phone group. *Note*: one value may already appear.

Now we are ready to collect a lot of different samples and see how likely we are to get 12 or more drivers that are distracted. Let's graph these points as we collect them.

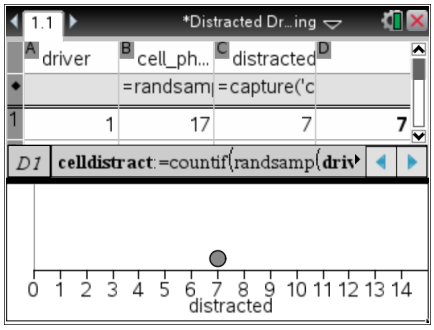
6. In the *Lists & Spreadsheet* page, press (doc▾), *Page Layout, Select Layout, Layout 3*.

7. Press (ctrl) (tab) to move between the different windows. Select the *Data & Statistics* application for the lower window.



8. Press (ctrl) (tab) to highlight the *Data & Statistics* app.

   - Press (tab) and select **distracted**.
   - Press (ctrl) (menu) and select *Zoom, Window Settings*. Change X_{min} to 0 and X_{max} to 15.



9. Press (ctrl) (tab) to get back to the *Lists & Spreadsheet* app. Press (ctrl) [R]. A new value should appear in the **distracted** list and a new point should appear on the graph. Keep pressing (ctrl) [R] until there are approximately 50 points.

How many times did the number of distracted drivers in the Cell phone group reach 12 or more?

Based on this, what is your conclusion?

Share your results with other students in your class. Did they reach the same conclusion? Why or why not?