

Creating a Hyperlink Document

- **1.** Create a document in Word, referencing Internet sites or folders you wish to hyperlink.
- **2.** Using your mouse, highlight the text you want to hyperlink. Right-click with your mouse.

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	Select Text with Similar Formatting

3. Select Hyperlink from the drop-down list.

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4. Select the file you wish to hyperlink to and click OK. If you want to hyperlink to a website, type the website address in the field titled Address. Then click OK.



Using the CBR TI-73

- **1.** Connect the CBR to the TI-73 using the calculator-to-CBR cable. Make sure both ends are pressed firmly to make the connection.
- 2. Press APPS.
- **3.** Select CBL/CBR.



4. Press any key. Then select Ranger.



5. Follow the on-screen instructions. Press ENTER.



6. Select 1: Setup/Sample.



Using the CBR TI-73

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- **8.** Use \bigtriangledown to arrow to the TIME row. Change the time to 5 seconds.
- 9. Use sto arrow to START NOW. Press ENTER.
- **10.** Point the CBR at the target and press ENTER.
- **11.** The CBR will collect data for 5 seconds. A graph of the data will appear.
- **12.** Press ENTER to return to the plot menu.



- **13.** Select 7: QUIT or choose other options as desired.
- **14.** The calculator will tell you the lists where it has stored the data.
- **15.** Press ENTER. Then press LIST to see the data.

L1	Lz	L3	2
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L200 =,	. 41957	71	

16. Repeat as necessary.

Technology Tutorial: Internet Explorer: Data Station B

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Hit the Dot, <u>http://faculty.washington.edu/chudler/java/dottime.html</u>, collects cumulative data as individuals play the game. The cumulative data represents the scores earned on first attempts at **Hit the Dot**. To prevent an individual from recording more than one score, the website places a "Cookie" on the computer that indicates that you have already posted a score to the website. You may play the game as many times as you like; however, the website's cumulative data only adds your first score.

Because more than one individual is playing the game at this computer, it becomes necessary to delete the Cookie after each individual plays the game. This will allow the score for each individual to become part of the cumulative data.

1. In Internet Explorer, click on the **Tools** menu to view the drop-down menu. Click **Internet Options.**





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1 Click 2. 1 po	c on the black dots as they int per hit, minus 1 point p	appear in the white circ er miss.	cles.
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Start Game Stop Ga	me Time:	•	0 to 10 dots

2. On the General tab, click Settings	Internet Options General Security Privacy Content Connections Programs Advanced
ener ocumes.	Home page You can change which page to use for your home page. Address: <u>http://intranet/</u> Use Current Use Default Use Blank Temporary Internet files Pages you view on the Internet are stored in a special folder.
	Images you view on the internet are stored in a special rolder for quick viewing later. Delete Cookies Delete Files
	History The History folder contains links to pages you've visited, for quick access to recently viewed pages. Days to keep pages in history: 2 🔛 Clear History
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3. Click View	OK Cancel Apply



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4. Select the Cookie that contains "@washington.edu" in the nam



5. Click on the **File** menu, click **Delete**.

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6. Click on the **Yes** button to delete the selected Cookie.

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1. Press ON.

2. Press LIST. If data is in the columns, you will need to clear the data by moving the cursor to the top with the arrow keys until L_1 is highlighted, press CLEAR then ENTER. Repeat to clear all data from the other lists if needed.



3. Enter data in L_1 and L_2 . After each value is typed, press ENTER.

L1	L2	L3 3
5501044	5 52225 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	
L300 =		

4. To access the Plot menu, press 2nd Y=.



5. Press ENTER].



6. Turn the plot on by using the arrow keys to move the cursor over On and pressing <u>ENTER</u>.



7. Arrow down to TYPE, then use your ▶ key to move to the first box and whisker plot. Press ENTER.



8. Arrow down to XLIST. The calculator defaults to L_1 . If your data is in another list, you will need to press 2nd LIST, select the appropriate list, then press ENTER.

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9. To set your window, press WINDOW. Xmin is the minimum x-value that you want displayed in your viewing window. Xmax is the maximum x-value that you want displayed in your viewing window.





The range of the heights was from about 145 centimeters to 210 centimeters. Xscl defines

the distance between tick marks : 10 is an appropriate Xscl for this window. Use \frown or \bigtriangledown to move the cursor to the variable you want to change. Type the new value on each line, then press ENTER after each change.



For box and whisker plots, Ymin and Ymax are ignored, so you will not need to make any changes.

10. You may need to remove graphs located in Y=. If so, press Y= then clear out all equations by pressing <u>CLEAR</u> for each line.

<12- <Υ3= <Υ4=	<Υ2= <Υ3= <Υ4=	
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11. Press **GRAPH** to view the graph.





1. Press ON.

2. Press STAT.



3. Press 1 to select Edit.

5	Lz	L3 1	
			_
L1 =			_

If data is in the columns, you will need to clear the data by moving the cursor to the top with the arrow keys until L_1 is highlighted, press CLEAR then ENTER. Repeat to clear all data from the other lists if needed.

4. Enter data in L_1 and L_2 . After each value is typed, press ENTER.

L1	L2	L3 3
59901055 55901055	61,5 622,5 669,69 69,69	
L3(1) =		

5. To access the Stat Plot menu, press 2nd Y=.





6. Press ENTER.

7. Turn the plot on by using the arrow keys to move the cursor over On and pressing <u>ENTER</u>.



8. Arrow down to TYPE, then use your \blacktriangleright key to move to the second box and whisker plot. Press ENTER.



9. Arrow down to XLIST. The calculator defaults to L_1 . If your data is in another list, you will need to press 2nd STAT, select the appropriate list, then press ENTER.

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10. To set your window, press WINDOW. Xmin is the minimum x-value that you want displayed in your viewing window. Xmax is the maximum x-value that you want displayed in your viewing window.

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Xmin=710	
Xmax=10	
Xscl=1	
Ymin=-10	
Ýmax=10	
Vscl=1	
$\frac{1}{2}$	
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The range of the heights was from about 145 centimeters to 210 centimeters. Xscl defines

the distance between tick marks : 10 is an appropriate Xscl for this window. Use \frown or \bigcirc to move the cursor to the variable you want to change. Type the new value on each line, then press ENTER after each change.

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For box and whisker plots, Ymin and Ymax are ignored, so you will not need to make any changes.

11. You may need to remove graphs located in Y=. If so, press Y= then clear out all equations by pressing <u>CLEAR</u> for each line.

Plot1 Plot2	Plot3	
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12. Press **GRAPH** to view the graph.





1. Press ON.

2. To calculate one-variable statistics for data that has already been entered in your lists,

press 2nd LIST.



3. Use your right arrow button \blacktriangleright to arrow over to CALC.



4. Press 1.



5. Press 2nd/LIST then select the list you wish to use. Press ENTER.

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1-Var	Stats	L1



6. Press ENTER again.



- 7. You can now use the \blacktriangle and \bigtriangledown keys to scroll through the statistics.
- **8.** The various calculations listed in this window are:

Symbol	Definition
$\frac{-}{x}$	Mean
$\sum x$	Sum of <i>x</i> values
$\sum x^2$	Sum of x^2 values
Sx	Sample standard deviation of <i>x</i>
σx	Population standard deviation of <i>x</i>
n	Number of data points
minX	Minimum of <i>x</i> values
Q 1	Lower (1 st) Quartile
Med	Median
Q3	Upper (3 rd) Quartile
maxX	Maximum of <i>x</i> values



1. Press ON.

2. To calculate one-variable statistics for data that has already been entered in your lists, press <u>STAT</u>.



3. Use your right arrow button \blacktriangleright to arrow over to CALC.



4. Press 1.



5. Press 2nd STAT. then select the list you wish to use. Press ENTER.

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6. Press ENTER again.



- 7. You can now use the \blacktriangle and \bigtriangledown keys to scroll through the statistics.
- **8.** The various calculations listed in this window are:

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$\frac{-}{x}$	Mean
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n	Number of data points
minX	Minimum of <i>x</i> values
Q_1	Lower (1 st) Quartile
Med	Median
Q3	Upper (3 rd) Quartile
maxX	Maximum of <i>x</i> values



Technology Tutorial: Grams of Fat Activity 1

Formatting Chart Cells

1. Open the Excel A document Middle School-Explore Explain 2 Spreadsheet.xls.

2. Select Sheet 1 containing the template: Grams of Fat.

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Scroll over the flag in cell G4. The HINT implies that the formula needed for this cell is =Sum(highlight range of cells), which means to enter =SUM(and then highlight the cells necessary by clicking and dragging the mouse from cell C4 to cell F4. Followed by a close parenthesis and Enter.

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Scroll over the flag in cell C5. The HINT implies that the formula needed for this cell is =(cell with number of people in interval 0 to 9)/(cell with total), which means to input =. Then click on cell C4, followed by the backslash, followed by cell G4, and Enter.

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5. Scroll over the flag in cell **D5**. The HINT implies that the formula needed for this cell is =(cell with number of people in interval 10 to 19)/(cell with total), which means to enter =. Then click on cell **D4**, followed by the backslash, followed by cell **G4**, and **Enter**.

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Scroll over the flag in cell E5. The HINT implies that the formula needed for this cell is =(cell with number of people in interval 20 to 29)/(cell with total), which means to input =. Then click on cell E4, followed by the backslash, followed by cell G4, and Enter.

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Scroll over the flag in cell F5. The HINT implies that the formula needed for this cell is =(cell with number of people in interval 30 to 39)/(cell with total), which means to enter =. Then click on cell F4, followed by the backslash, followed by cell G4, and Enter.

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Scroll over the flag in cell G5. The HINT implies that the formula needed for this cell is =Sum(highlight range of cells), which means to enter =SUM(and then highlight the cells necessary by clicking and dragging the mouse from cell C5 to cell F5. Followed by a close parenthesis and Enter.

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9. Note: Until data is entered, cells will show an error message due to division by zero.

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Formatting Mean, Median and Mode

- 1. Open the Excel Advancement Middle School-Explore Explain 2 Spreadsheet.xls.
- 2. Select **Sheet 2** containing the templates: **Data Pieces** and **Measures of Central Tendency**.

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3 Scroll over the flag in cell **H5**. The HINT implies that the formula t

Scroll over the flag in cell H5. The HINT implies that the formula needed for this cell is =Average(highlight range of cells), which means to enter =Average(and then highlight the cells necessary by clicking and dragging the mouse from cell B4 to cell E27. Followed by a close parenthesis and Enter.

AVERAGE	- × v	fx =averag	ge(B4:E27)					
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Scroll over the flag in cell H6. The HINT implies that the formula needed for this cell is =Median(highlight range of cells), which means to enter =Median(and then highlight the cells necessary by clicking and dragging the mouse from cell B4 to cell E27. Followed by a close parenthesis and Enter.

AVI	ERAGE	- × V	<i>f</i> ∗ =media	n(B4:E27)					
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Scroll over the flag in cell G5. The HINT implies that the formula needed for this cell is =Mode(highlight range of cells), which means to enter =Mode(and then highlight the cells necessary by clicking and dragging the mouse from cell B4 to cell E27. Followed by a close parenthesis and Enter.

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* Note: If the data set contains more than one mode, only the one with the lowest value will be recorded.

AVERAGE	▼ X √	<i>f</i> ∗ =mode	(B4:E27)					
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3	0 to 9	10 to 19	20 to 29	30 to 39				
4			 			Measures of Cent	al Tendency	
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6. Note: Until data is entered, cells will show an error messages.

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	Data P	leces			
0 to 9	10 to 19	20 to 29	30 to 39		
				Measures of Centra	l Tendency
				Mean	#DIV/0!
				Median	#NUM!
				Mode	#N/A



Technology Tutorial: Fat Grams Graph Activity 2

Creating the *Grams of Fat* Graph:

Participants are allowed to select the type of graphical representation of their choice; therefore two possible types of graphs are shown: Histogram and Pie Graph.

I. Histogram

1



1. Open the **Excel** document **Middle School-Explore Explain 2 Spreadsheet.xls**.

2. In order to use the Data Analysis Toolpak to create a histogram, you will need to create Bin Values. The Bin Value represents the highest value of each interval in the data set.

For example, if the intervals sort the data from 0 to 9, 10 to 19, 20 to 29, and 30 to 39, there would be four Bin Values: 9, 19, 29, and 39 as seen on the lower left hand side of **Sheet 3**.

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3. In the toolbar under the **Tools** menu select **Data Analysis**.



4. Select Histogram and click OK.

Data Analysis	×
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Histogram Moving Average Random Number Generation	

5. Click the **Input Range** icon **III**. Highlight the cells that contain your data, by clicking on cells **B4** and dragging down to **E18**. The numbers will be highlighted by

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"marching ant" tracks. Then click on the **Import** icon

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6. Click the **Bin Range** icon **Select Sheet 3** before, highlighting the cells that contain your Bin values and then click on the **Import** icon **Select Sheet 3**.

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Histogram			
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7. Under Output Options select Output Range, and click the Output Range

icon III. The Output Range allows you to choose where the histogram will appear on the spreadsheet. You may need to select **Sheet 3** before selecting the empty cells

below the Graph section of the spreadsheet, and then click on the **Import** icon

Histogram		X			Grapl	1	
Input			*******	*******	******		 <u>.</u>
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8. Then select Chart Output and click OK.

, Histogram		X
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Output options Output Range: New Worksheet Ply:	\$J\$3:\$N\$15	
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9. Double Click on the middle of a bar in the graph. Select Options

Histogram	
40 20 9 19 Series "Frequency" Point "29" Value: 20	Frequency Format Data Series Patterns Axis Y Error Bars Data Labels Border Area Automatic Nong Custom Nong Style: Image: Color: Automatic Nong Golor: Automatic Weight: Image: Color: Shagow Fill Effects Sample Invert if negative

10. Choose **Option** and change **Gap Width** to 0. Click **OK**.

Format Data Series				
Patterns Axis Y Error Bars Data Labels	Series Order Options			
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Histogram				
25 20 5 15 5 0 3 13 23 33 More	Frequency			
Bis				
	OK Cancel			

11. To adjust the size of the graph, click in the area between the graph and the border. Click and drag a corner handle until the graph is the correct size.

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II. Pie Graph

.3

- 1. Open the Excel Kernel document Middle School-Explore Explain 2 Spreadsheet.xls.
- 2. Select **Sheet 2**, and highlight data pieces by clicking on cell **B4** and dragging down to cell **E18**. The numbers will be highlighted by "marching ant" tracks.

Data Pieces				
0 to 9	10 to 19	20 to 29	30 to 39	
0	10	28	30;	
4	14	24	30,	
5	25	24	37	
3	19	26	36	
3	16	21	34	
5	14	28	32	
7	17	29	32	
8	12	29	32	
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1			38	
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3. Select the Chart Wizard in the toolbar





4. **Step 1**: Select the **Pie** chart type, and then click **Next**.

Step 2: Since the data was highlighted first click **Next**.

Step 3: Enter a Chart tile (Trials, Trials, Trials), then select the Data Labels tab and check Category name, Percentage and click Next.

Step 4: Select As object in, and then Finish.





- 5. A graph will appear on the spreadsheet.
- 6. To adjust the size of the graph, click in the area between the graph and the border. Click and drag a corner handle until the graph is the correct size.


Technology Tutorial: Loading Data Analysis Toolpak

Advance Preparation: Loading the Toolpak

You must load the Data Analysis Toolpak before you can generate a histogram using Excel. If the Data Analysis Toolpak is not under the Tools menu, complete the following steps to load the Toolpak.

1. Click Start, Programs, Microsoft Office, Microsoft Office Excel.

- 2. Open an **Excel** document.
- 3. In the toolbar under the **Tools** menu, click **Add-Ins**.



4. In the Add-Ins box, check Analysis Toolpak. Click **OK**



5. The **Data Analysis** Toolpak can now be found in the **Tools** menu.



Technology Tutorial: Loading TI Connect

TI Connect is a linking software used to download and transfer data, and connect calculator, computer and internet platforms.

Note: In order for TI Interactive 1.3 software to interface with the TI Connect software a 1.5 or higher version of TI Connect must be downloaded.

Advance Preparation

Google search: TI Connect, select TI Connectivity Kit (*) and Bookmark. Website: Appearance of the Texas Instruments website may differ. <u>http://education.ti.com/us/product/accessory/connectivity/down/download.html</u>



- 1. TI requires a registration/login process to the website. Registration/Login process follows:
 - A. Google/Browse to website, if bookmarked use bookmark: http://education.ti.com/us/product/accessory/connectivity/down/download.html



B. Select the appropriate computer platform (*). If a **Security Alert** window pops up click **OK**.





C. The registration/login process will begin at this point. Select **New User Registration** or input **User Name** and **Password**. Personal information and an agreement with terms will follow for new users. As illustrated below (*). If a **Security Alert** window pops up click **YES**.

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3. Select Save (*), and save to the Desktop. Download will begin.



4. Once download is complete, close all windows. A **TI Connect_eng.exe** icon will appear on the desktop.

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5. Double click on the **TI Connect_eng.exe** icon , and run set up.



6. The **TI Connect Set**-up will go through several windows including a software license agreement.

i Ti Connect 1.6 Setup		i	🖟 TI Connect 1.6 Setup	
We	elcome to Tl Connect™ 1.6			We recommend that you exit all other applications before installing TI Connect 1.6.
TIC * Do * Dor * Ca	Connect [™] Software makes it easy to: www.load graphing calculator software applications (Apps) ag and drop all data types, such as lists, variables, etc. plure screen images for use in other documents			If you receive a Microsoft® warning regarding a driver not being signed, please select 'Continue Anyway' in order for your Texas Instruments Education Software to install properly.
Ba	ckup data from a graphing calculator to a computer			TI Connect version 1.6 provides advanced communications capabilities that may require an update to your TI device's Operating System. (You can update using TI OS Downloader following installation.)
Texas INSTRUMENTS To ex- conti	xit the installation at any time, click on Cancel. To inue, click on Next.		TEXAS INSTRUMENTS	Do you want to continue installing TI Connect version 1.6?
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(continue)



Grades 6 - 8

🖗 TI Connect 1.6 Setup	🖓 TI Connect 1.6 Setup
Please read the following license agreement. Use the scroll bar to view the rest of this agreement.	Please verify or change the TI Connect destination location according to your preference.
TEXAS INSTRUMENTS PC SOFTWARE LICENSE	Destination Folder C:\Program Files\TI Education\ Browse
By downloading the software and/or documentation you agree to abide by the following provisions.	
1 License: Subject to your payment of any applicable license fee, Texas Instruments Incorporated ("TI") grants you a license to copy and use the software program(s) and documentation from the linked web page or CD ROM ("Licensed Materials"). In addition to the copy S	Disk Space Click the Disk Cost button to see the disk space required to Disk Cost install this product.
 I accept the license agreement I do not accept the license agreement 	To continue, click on Next.
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i 🖗 TI Connect 1.6 Setup	🖗 TI Connect 1.6 Setup
We now have enough information to install TI Connect 1.6 on this computer. To begin the installation, click on Next. To review or change any of the installation information, click on Back.	TI Connect 1.6 has been successfully installed!
Current Settings Folder: C.\Program Files\TI Education\ Start Menu: TI Tools	TEXAS INSTRUMENTS Click the Finish button to exit this installation.
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- 7. Close all windows when setup is complete.
- 8. A **TI Connect** icon will appear on the desktop.
- 9. Drag the **TI Connect _eng.exe** icon to the trash can, and delete.



APPS

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The TI Probability Simulation APPS is an application software with interactive animation of the following probability situations: tossing coins, rolling dice, drawing marbles, spinning spinners, drawing cards, and generating random numbers. The TI Probability Simulator APPS requires the TI-73 Operating System 1.6.

Advance Preparation

- Check for TI Connect software on computer; if not loaded, load using Technology Tutorial Loading TI Connect.
- If the computer has TI Interactive, make sure it is version 1.3 or higher.
- Connect a TI-73 calculator to a computer with internet access using a **TI Silver Graph Link**. Be sure to turn on the calculator.
- Google and Bookmark the website (appearance of the Texas Instruments website may differ): <u>http://education.ti.com/us/product/apps/probsim.html</u>



- 1. TI requires a registration/login process to the website. Registration/Login process follows:
 - A. Google/Browse to website, if bookmarked use bookmark: <u>http://education.ti.com/us/product/apps/probsim.html</u>

B. Select **download** for the appropriate calculator. For Example: TI-73 Explorer (*) was selected. If a **Security Alert** window pops up click **OK**.

C. The registration/login process will begin at this point. Select **New User Registration** (*) or input **User Name** and **Password**. Personal information and an agreement with terms will follow for new users, as illustrated below (*). If a **Security Alert** window pops up click **YES**.

Site: Login - Microsoft Internet Explorer provided by esc.Works. NET	Site: User Registration - Microsoft Internet Explorer provided by escWorks. NET
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 You will need to download the TI-73 Explorer(tm) Operating System first, followed by the Probability Simulation (*). For Example: TI-73 Explorer(tm) Operating System was selected first.

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3. Select the **TI-73 Explorer(tm) Operating System,** select **Save** (*), and save to the **Desktop**. Download will begin.

4. Once download is complete, minimize the window, My Pick-Up.... A TI Operating

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System icon

will appear on the desktop.

5. Click and drag the **TI Operating System** icon <u>onto</u> the

6. A **OS Download Warning** will appear, click **OK**. (*Note: all applications on the calculator will be deleted when upgrading to the new operating system.*)

OS Downlo	ad Warning
Ŀ	Downloading an OS to your TI device will erase data that exists in your RAM. Warning: For the TI-89, TI-92+, and TI Voyage 200, all data including Applications will be deleted when upgrading to OS 2.08 or higher. Click OK to continue the transfer. Click Cancel to stop the transfer. Consult Help for details on backing up RAM, Archive, and Applications. OK Cancel

7. Transferring of the operating system to the TI-73 calculator will begin. While the operating system is transferring, the graphing calculator will read: Receiving Calculator Software. This process will take about 5 to 10 minutes. Once you have downloaded the operating system, the calculator will read: Validating Calculator Software followed by Graph Explorer Software 1.60 title screen.

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8. Maximize the window, **My Pick-Up**. Repeat steps 2-5 for downloading the **Probability Simulation**. If a **Document and Setting** window pops up click and **OK**, then restart download by selecting the **Probability Simulation** again.

9. Transferring of the **Probability Simulation APPS** will begin and the TI-73 calculator will read: Receiving Pro Sim APP. This process will take about 1 minute.

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10. Check to see if you have downloaded the **Probability Simulation APPS** correctly onto the calculator, by selecting the **APPS** key on the calculator. If the download was successful a new application titled **Prob Sim** will be in the list.

11. Drag to trash the **TI Operating System** and the **Probability Simulator** icon to the trash can and delete.

Technology Tutorial: TI-Interactive: The Big Question Presenter(s) Spreadsheet

Create a Presenter(s) Spreadsheet before starting the activity. This will enable the presenter(s) to flow between each group's data efficiently.

Advance Preparation

- Load TI-Interactive 1.3 software (will need to be purchased) onto computer: See TI-Interactive instructions manual.
- Load TI-Connect 1.5 software onto computer: See Loading TI Connect Technology Tutorial.

Create Presenter(s) Spreadsheet

- 1. Open TI-Interactive
- 2. In the toolbar select the **Spreadsheet** icon

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4. Starting with cell **A1** click and drag to the lower right-hand side of the spreadsheet until all cells are highlighted.

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5. In the tool under the **Format** menu select **Cells**.

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6. Set Alignment to Center and Number Format to General, select Apply and then OK.

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OK Cancel Apply Help

7. Click on cell **B2** and type in **Possible Outcomes**, then **Enter**. Continue until you have set up all labels and groups. Some columns may need to be resized; instructions for resizing are below illustration. *Note: if more than five groups are needed just include another column labeled accordingly. Also, if fewer than five groups participate in the activity, having extra columns set up will not affect the outcome of the calculations. It is better to have too many groups set up, than too few.*

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To resize column width or roll height: move curser into the column labels (or roll labels) when the curser changes from a pointer to a **two sided arrow** (*) and a **resizing line** appears, click and drag to the desired size.

8. Click on cell C3, in the toolbar select Functions (f(x)).

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9. Scroll down to SUM, and then click OK.

Spreadsheet Functions
Function name:
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SUM(number_list)
Returns the sum of the supplied numbers.
OK Cancel Help

10. Highlight cells **E3** to **I3**. *Note: There will be changes in the Sum formula as you highlight the cells.* Enter a close ()) parentheses and then **Enter**. *Also, the sum will be zero at this time.*

11. Repeat steps 9-11 for cells C4, C5, C6, C7, and C8 using the corresponding Group cells.

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12. Click on cell **B10**, and input label, **Total Trials**. Click in cell **B11** and use the sum formula to total the frequency column, this will require highlighting cells **C3-C8**. Enter a close ()) parentheses and then **Enter**

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13. Table with formatted cells.

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14. Click on the C column. In the toolbar under the **Insert** menu select **Cells**. In the popup menu select **Shift cells right** and click **OK**.

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15. Resize new column as explained in step 7, and input label **Experimental Probability**.

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16. Click in cell C3. Enter = followed by clicking on cell D3, backslash and cell G14, and then Enter

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17. Repeat step 16 for cells C4, C5, C6, C7, and C8 using the appropriate corresponding cells.

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Note: Due to division by zero an error message will appear until data has been entered.

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1						
2		Possible Outcomes	Experimental Probability	Frequency	Group #1	Group #2
3		1	#DIV/0!	0		
4		2		0		
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6		4		0		
7		5		0		
8		6		0		
9						
10		Total Trials				
11		0				
12						
13						
List	: 🗸 Matrix	∖ Spreadsheet ∕				•

18. In the toolbar under the **File** menu select **Save To Document**. Save to the **Desktop** as **The Big Question**.

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	Save as type: TI InterActive! Format Cancel

Technology Tutorial: TI-Interactive - The Big Question Graph

Create a Presenter(s) Spreadsheet before starting the activity. This will enable the presenter(s) to flow between each group's data efficiently.

Advance Preparation

• Create The Big Question Presenter(s) Spreadsheet using the Technology Tutorial: The Big Question Present(s) Spreadsheet.

Create Presenter(s) Graph

- 1. Open TI-Interactive: Middle School-Explore Explain 3 Spreadsheet.tii or The Big Question spreadsheet (if formatted by presenter.)
- 2. Double click on the graphic (*).

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	2	Possible Outcomes	Experimental Probability	Frequency	Group #1	Group #2	Group
	3	1	#DIV/0!	0			
	4	2	#DIV/0!	0			
	5	3	#DIV/0!	0			
	6	4	#DIV/0!	0			
	7	5	#DIV/0!	0			
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	13 14 1) List	∧ Spreadsheet		•			

3. Have one group at a time input their results for each outcome. Once two or three groups have inputted data, highlight the **Possible Outcomes** and **Experimental Probability** columns, by clicking on cell **B3** and dragging to cell **C8**. (If using TI-83 calculators, data may be collected using a linking device between the computer and a calculator. Steps for linking and importing data can be found at the end of this tutorial.)

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1							
2	Possible Outcomes	Experimental Probability	Frequency	Group #1	Group #2	Group #3	Group #4
3	1	0.1	4	0	2	1	1
4	2	0.2	8	1	4	1	2
5	3	0.125	5	2	1	1	1
6	4	0.275	11	4	2	2	3
7	5	0.15	6	2	0	3	1
8	6	0.15	6	1	1	2	2
9	_						
10							
11		Total Trials	40				
12							

4. In the toolbar select the **Graph** icon I and the **Graph** icon may look different based on the last type of graph created. In the **Graph** menu select the **Y**= graph icon

🧱 Data Editor			
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A1			
A B	С	C F	G H
1 []			
2 Possible Outcomes	Experimental Probability	Frequency proup #	1 Group #2 Group #3
3 1	0.1	4 0	2 1

5. Notice the sample shows data plotted, and corresponding cell ranges set under **Stat Plots** in the **Functions** window.

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6. Reset point size by clicking on the **Point Selection Box**, and selecting **3** in the **Size** drop-down menu.

	🗗 Functions 🛛 🗙	()	Stat Plot Styles
*	Y= Stat Plots ■ ■ B3:B8 C3:C8		Plot Type: XY Scatter
	Independent Variable: Independent Variable: Image: Deselect All Copy All Close Help		Style: Veight: Color: Color: Mark Symbol: Size: 3 Color: Help OK 4

7. Reset point color by selecting **Black** in the **Color** drop-down menu.

🗗 Functions 🛛 🗙	Stat Plot Styles	
Y= Stat Plots ■ ■ B3:B8 C3:C8 ■	Plot Type: XY Scatter XList: B3:B8 YList: C3:C8 Use Frequency	*
Independent Variable Deselect All Basic colors: Basic colors: Custom colors: Define Custom Colors >>	Line Style: Veight: Color: Mark Symbol: Size: 3 C OK Cancel Help	
OK Cancel		

8. Click **Format** (*), under **Window** set the x- and y-axis minimums and maximums as shown, click **Apply**, and then **OK**.

9. Under **Y**= in the **Function** window input the appropriate function. The leader notes for this activity discuss function.

10. Reset the line width by clicking on the **Line Selection Box**, and selecting **the second width choice** in the **Weight** drop-down menu.

11. Reset line color by selecting **Black** in the **Color** drop-down menu.

🕾 Functions	×	Graph Styles 🗙
Y= Stat Plots	1	y1(x):=1/6 Connected C Dot
$\nabla = 175$ $\nabla = 175$ $\nabla = 175$ $\nabla = 175$		Line Style: Veight: Color:
□		Animate
		Shade None C Above C Below
Independent Variable: Y		Shading Style: Color:
Color (7) Deselect All Basic colors:	<u>×</u>	Detect Discontinuities
		OK Cancel Help
Custom colors:	_	
Define Custom Colors >>		
OK Cancel		

- 12. Have another group input their data, continue process as classroom discussion continues
- 13. Close Middle School-Explore Explain 3 Spreadsheet.tii or The Big Question using the close box

Importing Data using a Linking Device

One at a time each group of participants will connect their calculator to the computer using a TI-Graph Link USB. Make sure the calculator in turned on, and at home screen.

*Note: Graphic of tables may differ, but procedure is the same.

- 1. Open TI-Interactive: Middle School-Explore Explain 3 Spreadsheet.tii or The Big Question spreadsheet (if formatted by presenter.).
- 2. Double click on the graphic (*).

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		1	~	D	U.	0	E	F	0	n	1	-
		2	Possibl	e Outcomes 1	Frequency 0	r G	roup #1	Group #2	2 Group #3	Groups#4	Group #5	- P
		4		2	0							
		5		3	0							-81
		7		5	0							
		8		6	0							
		9										
		11	Tota	l Trials								
		12		0								
			t ∕(Matrix ∕), Si	oreadshaet /				•				
	Ready								U	1, Col 1	NUM	11.

3. Select the **List** tab at bottom of spreadsheet.

			~*						
31									
32									
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		, <u> </u>							
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4. Select the Import TI Device Data icon on the Toolbar.

3

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Follow instruction and select the list that contains the data you intend to import. (Instructions will vary here depending on what type of calculator the participants use.)

5. Data will import into the appropriate list: In the example, data were in L1 of the calculator; therefore they were imported into L1 in the list editor.

listname formula	L1 {}	L2 {}	L3 {}	÷г
1	8			
2	5			
3	6			
4	8			
5	9			
6	<u>5</u>			
7				
<u>^</u>				

6. Highlight data as shown above and select **Copy** in the **Edit** menu.

₩ D	ata E	ditor							
File	Edit	View	Insert	Format	List	Data			
₿	Ur Re	n do edo		Ctrl Ctrl	+Z +Y				
TI Ma	CL	Jt		Ctrl	+X	B			
list for	Co Pa De	aste elete	5	Ctrl+C Ctrl+V					
	ci ci	Clear Selected Cells Clear All Cells							
	Fir Re	nd eplace	_.	Ctrl Ctrl					
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8. Highlight the first cell under the appropriate Group, and select **Paste** under the **Edit** menu.

₩ D	ata Edi	itor													
File	Edit V	iew	Insert	Format	Tools	s Dal	ta H	elp							
围	Unda Reda)		Ctr Ctr	′l+Ζ ′l+Υ		17	a z↓	Z.	, .	W.	Σ.	f(x)		
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	Find. Repla	 ace		Ctı Ctı	∕l+F ∕l+H			0							
	Go T	o Cel	I	Cti	/I+G			0							
	7 8			6	5 6			0 0							
	9														

9. Data will be imported into the appropriate cells.

Group #'	Group	#2	Group	#3	Group	#4	Group	#5	Group	#6
8]									
5	Ï									
6										
8										
9										
5										

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The following is an example: participants may create a table and labels independent of this example. Therefore participants table and graph will vary.

Creating the Table

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- 1. Open an Excel 📈 document.
- 2. The following illustration is the product created in steps 3-7.

	A	В	С	D
1				
2				
3				
		Different	Fraguanay	
4		Outcomes	riequency	
5		1		
6		2		
7		3		
8		4		
9		5		
10		6		
11				

3. Click on cell A1 and drag to cell D10.

	A	В	С	D	E
1					
2					
3					
4		Different Outcomes	Frequency		
5					
6					
7					
8					
9					
10					
11					
12					
13					

4. In the toolbar under the **Format** menu, select **Cells**.

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:2	<u>F</u> ile	<u>E</u> dit	⊻iew	Insert	For	mat	<u>T</u> ools	<u>D</u> ata	<u>W</u> indow	_ <u>H</u> elp
10	C2		3 @	8 K	r	C <u>e</u> ll	s N		Ctrl+1	1 (10)
	1	b 2	16	318		<u>R</u> ov	v 14		•	hange:
:	.	2 1	6	nadit M		⊆ol	umn		•	
	A1	101 2	+	f _x		S <u>h</u> e	et		•	
		A		B		Aut	oFormat			
1					1	Cor	n <u>d</u> itional f	Formatti	ing	
2						≦ty	le			-
4										-
5										
6										
9										
10										
11										

5. Under the **Alignment** tab, use the pop-down menu under the Horizontal and Vertical text alignment to select Center. Select **Wrap Text** by clicking in the box under text control. Click **OK**.

Format Cells				?×
Number Alignment	Font	Border	Patterns	Protection
Text alignment			Orien	tation
<u>H</u> orizontal:				••.
Center	*	Indent:		•.
Vertical:		0 🗘	T	
Center	~		×	Text — •
Iustify distributed			t	<u>,</u>
Text control				•
Wrap text				
Shrink to fit			0	Degrees
Merge cells Right-to-left				
Text direction:				
Context 👻				
	-			
		1	ОК	Cancel

6. Click cell **B4** and enter **Different Outcomes**, and click on **cell C4** and enter **Frequency**. If needed, adjust the size of the cells by clicking on the line to the left of the column and dragging the line left or right as needed. (Short cut: Use the down arrows on your keyboard to move down the column.)

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	C4	▼ f _x	Frequency	
	A	В	С	D
1				
2				
3				
4		Differenct Outcomes	Frequency	
5				
6				

7. Click on cell **B5** and enter 1, continue entering 2-6 in the cells below as illustrated.

	A	В	С	D
1				
2				
3				
		Differenct	Eroquepeu	
4		Outcomes	Frequency	
5		1		
6		2		
7		3		
8		4		
9		5		
10		6		
11				

8. Table is complete and ready to input data from the **Group Activity Sheet: Simulation #1** frequency table. Input data using cells **C5-C10**. (*Example uses the data found in the leader notes.*)

	C10	▼ fx	0	
	A	В	С	D
1				
2				
3				
		Differenct	Frequency	
4		Outcomes	riequency	
5		1	2	
6		2	6	
7		3	1	
8		4	7	
9		5	4	
10		6	0	
11				•

Creating the Graph

Participants may select the type of graphical representation of their choice; therefore, two possible types of graphs appear: **Bar Graph**, and **Pie Graph**. You may want to experiment with others.

More than one graph may be created and displayed side by side.

Bar Graph

1. Click and drag curser over the data to highlight. The example has cells **C5-C10** highlighted.

Differenct Outcomes	Frequency	
1	2	
2	6	
3	1	
4	7	
5	4	
6	0	

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10	Ż			6 18	Þi fi	5-19	- 🧕	Σ • ^A _Z	↓ <u>100</u> ,	0	Aria
	2	12	G	213	6	H (P	<i>₩</i> ∂R	eply with \subseteq	hanges	Chart Wizard	w
:					l I I I Receletor						·)

Step 1: Select the Column chart type, then click Next.
 Step 2: Since the data was highlighted first click Next.
 Step 3: Input a Chart tile (Trials, Trials, Trials), Categories (X) axis (Possible Outcomes), and Categories (Y) axis (Frequency), then click Next.
 Step 4: Select As object in, and then Finish.

Chart Wizard - Step 1 of 4 - Chart Type	Chart Wizard - Step 2 of 4 - Chart Source Data
Standard Types Custom Types	Data Range Series
Chart type: Column Bar Chart sub-type: Chart sub-typ	Data range: Sheetilk(C\$Si\$C\$10 Series in: Rows © Columns Cancel Cancel Einish
Chart Wizard - Step 3 of 4 - Chart Options	
Chart Wizard - Step 3 of 4 - Chart Options Titles Axes Gridlines Legend Data Labels Data Table Chart title: Trials, Trials, Trials Trials, Trials, Trials 8 Category (X) axis: 8 8	Chart Wizard - Step 4 of 4 - Chart Location
Chart Wizard - Step 3 of 4 - Chart Options	Chart Wizard - Step 4 of 4 - Chart Location Place chart: Image: Organized and the state of the state
Chart Wizard - Step 3 of 4 - Chart Options	Chart Wizard - Step 4 of 4 - Chart Location ? × Place chart: • As new sheet: • Chart 1 • As new sheet: • Chart 1 • O As new sheet: • Chart 1 • • • • • • • • • • • • • • • • • • •
Chart Wizard - Step 3 of 4 - Chart Options Titles Axes Gridlines Legend Data Labels Data Table Chart title: Trials, Trials, Trials Trials, Trials, Trials, Trials, Trials, Trials, Trials Image: Chart title Chart title: Trials, Trials Image: Chart title Image: Chart title Image: Chart title Chart title: Trials, Trials, Trials Image: Chart title Image: Chart title Image: Chart title Category (X) axis: Image: Chart title Image: Chart title Image: Chart title Image: Chart title Yalue (Y) axis: Image: Chart title Image: Chart title Image: Chart title Image: Chart title Second category (X) axis: Image: Chart title Image: Chart title Image: Chart title Image: Chart title Second value (Y) axis: Image: Chart title Image: Chart title Image: Chart title Image: Chart title Second value (Y) axis: Image: Chart title Second value (Y) axis: Image: Chart title Second value (Y) axis:	Chart Wizard - Step 4 of 4 - Chart Location ? × Place chart: • As new sheet: Chart1 • As new sheet: • Chart1 • • • • • • • • • • • • • • • • • • •


4. A graph will appear on the spreadsheet.





Pie Graph

- 1. Complete steps 1 and 2 of the Bar Graph on page 4.
- Step 1: Select the Pie chart type, and then click Next.
 Step 2: Since the data was highlighted first click Next.
 Step 3: Input a Chart tile (Trials, Trials, Trials), then select the Data Labels tab and check Category name, Percentage and click Next.
 Step 4: Select As object in, and then Finish.

Chart Wizard - Step 1 of 4 - Chart Type	Chart Wizard - Step 2 of 4 - Chart Source Data
Standard Types Custom Types	Data Range Series
Chart type: Column Bar Line XY (Scatter) Area O Doughnut Radar Surface Bubble Pie. Displays the contribution of each value to a total.	Data range: Stries in: Bows © Columns
Press and Hold to <u>Vi</u> ew Sample	
Cancel < Back Next > Einish	Cancel < Back Next >
Chart Wizard - Step 3 of 4 - Chart Options	Chart Wizard - Step 3 of 4 - Chart Options
Titles Legend Data Labels	Titles Legend Data Labels
Chart <u>title:</u> Trials, Trials, Trials	Label Contains Series name Trials, Trials, Trials
Category (X) axis: Value (Y) axis: Second category (X) axis: Second value (Y) axis:	 ✓ Category name Yalue ✓ Percentage Bubble size Separator: ▲ Legend key ✓ Show leader lines
Cancel < Back Next > Einish	Cancel < <u>Back</u> <u>Next</u> <u>Finish</u>
Chart Wizard - Step 4 of 4 - Chart Place chart: As new sheet: As new sheet: As object in: Sheet Cancel	Location ?X t1 t1 < <u>Back Next > Einish</u>



3. A graph will appear on the spreadsheet.



Technology Tutorial: TI-73: Trials, Trials, & More Trials Activity with APPS

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Notice there are two different sets of **Simulation Cards**. **The best scenario is to use Simulation Card Set 2 With APPS Program**. Card set 2 with APPS Program requires the **Probability Simulator APPS**, you can perform the activity without the simulator using Card Set 2 without APPS Program.

The following is an example: participants will generate different data independent of this example. Therefore participant's data and list will vary.

Advanced Preparation

Check all calculators for the **Probability Simulator APPS** by checking the APPS list for **Pro Sim**.



If the applications list does not contain the Probability Simulator APPS, then refer to the Technology Tutorial **Loading TI Probability Simulator APPS** and load the application software.

Trials, Trials, & More Trials with Probability Simulator

- 1. Press ON.
- 2. Press APPS.
- 3. Select the Probability Simulator, **Prob Sim.** Press ENTER twice.





4. Follow the instructions below for each specific simulation.

Number Cube

A. Select **Roll Dice**. Press ENTER.



B. Press WINDOW which will activate the first roll of the die. Continue pressing WINDOW until you have recorded 10 rolls.



Spinner

A. Select **Roll Dice**. Press ENTER.





B. Press ZOOM to activate settings. Using the arrow keys: set **Sections** to 6 and **Graph** to Freq. Press **GRAPH**.



C. Press WINDOW which will activate the first spin. Continue pressing WINDOW until you have recorded 10 spins.



5. To quit Probability Simulation: Press Y=.

<u>Return to</u>	Menu
This will all trials memory. you sur	clear from Are `e?
YES	l Ino

6. Press Y=.

Simul	ation
in T oş	s Coins
12. Ko I	I Uice
3.F10 4 Sei	n Spinner
5. Dra	w Cards
6.Rar	idom Numbers
OK	IOPTN IABOUTIQUIT



7. Press GRAPH.



8. Press Y=.



Creating a Line Plot

- 1. Press ON.
- 2. Press LIST.



3. Input the possible outcomes into L1 (list 1), one at a time. Press ENTER each time.

L1	Lz	L3 1	
1			
3			
45			
6			
			_
L1(7) =			

4. Curser over to L2 (list 2) using the arrow key ▶. Input the frequency of each possible outcome one at a time. Press ENTER each time. Record frequencies in the Groups Activity Sheet: Simulation #2 table. In this example: 2, 6, 1, 7, 4, 0 will be the frequencies of the six possible outcomes

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5. Press 2nd Y=.

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	-
2:Plot2Off	
L L1 L2	•
3:Plot30ff	
44PlotsOff	•

6. Select Stat Line. Press ENTER.



7. Using the curser keys and ENTER, select Plot 1 On, Type Line Plot, Xlist L1, and Ylist L2.

Plot1 💵 Of Type: 🗠 📾 Ø dbs Xlist: Li Vlist: Li	ff 光光 山山 中 中
Mark: 🖸 🔹	



8. Press WINDOW. Set window using illustration.

ηĭνĎΟΜ ⁻
Xmin=0_
Xmax=10
_AX=.1063829787
Xsçl= <u>1</u>
Ymin=0
Ymax=10
YSCI=1

9. Press GRAPH.



- 10. To quit: Press 2nd MODE.
- 11. Press 2nd ON.

Technology Tutorial: TI-73: Trials, Trials, & More Trials Activity with No APPS

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Notice there are two different sets of **Simulation Cards**. **The best scenario is to use Simulation Card Set 2 With APPS Program**. Card set 2 with APPS Program requires the **Probability Simulator APPS**, the activity can be done without the simulator using Card Set 2 without APPS Program.

The following is an example: participants will generate different data independent of this example. Therefore participant's data and list will vary.

Trials, Trials, & More Trials with No Probability Simulator

- 1. Press ON.
- 2. Press MATH.



3. Curser over to the \square **PRB** menu using the \blacktriangleright key.



4. Follow the instruction below for each type of simulation.



Number Cube

A. Select dice(. Press ENTER).



B. To simulate 5 rolls of a die: Enter 5).



C. Press ENTER, which will generate the first 5 rolls.

dice(5) {2 ∎	3	1	6	1)

D. Press ENTER, to generate the next 5 rolls.

dice(5) (2 dice(5) (1	3 4	1 6	6 6	1) 2)



Number Generator

A. Select **randInt(.** Press ENTER).

MATH NUM <mark>1995</mark> 1:rand	LOG
HrandInt(
3∶n⊏r <u>4</u> ∶ņCr	
5:¦ 6:coin(
7:dice(

B. To generate 5 random integers between 1 and 6: Enter 1,6,5).



C. Press ENTER which will generate the first five numbers.



D. Press ENTER which will generate the next five numbers.

5. To quit: Press 2nd ON.

Creating a Line Plot

1. Press ON.

umt³

2. Press LIST.



ching Mathematics

3. Input the possible outcomes into L1 (list 1), one at a time. Press ENTER each time.



4. Curser over to L2 (list 2) using the arrow key ▶. Input the frequency of each possible outcome one at a time. Press ENTER each time. Record frequencies in the Groups Activity Sheet: Simulation #2 table. In this example: 2, 6, 1, 7, 4, 0 will be the frequencies of the six possible outcomes



5. Press 2nd Y=.

	•
2:Plot20ff	
3:Plot3Off	-
<u> ⊬</u> L1 L2 4↓PlotsOff	•



6. Select Stat Plot 1. Press ENTER.



7. Using the curser keys and ENTER, select Plot 1 On, Type Line Plot, Xlist L1, and Ylist L2.



8. Press WINDOW. Set window using illustration.

WINDOW Xmin=0 Xmax=10 AX=.1063829787 Xscl=1 Ymin=0 Ymax=10
Yscl=1

9. Press GRAPH.



10. To quit: Press 2nd MODE.

11. Press 2nd ON.



Technology Tutorial: Importing Data and Charts

1. To import data, "click and drag" to highlight the cells containing the data and data labels.

1 second	1 second	5 seconds	
without feedback	with feedback	without feedback	
1.0	1.6	4.0	
1.0	1.1	3.5	
1.2	1.3	3.3	
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2. Right click on the highlighted cells. Click on **Copy**.

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3. Click on the appropriate file on the menubar to open the document that will contain your imported data.

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4. Right click on this document. Click on **Paste**.



5. The highlighted cells will be imported into your document.

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1.2	1.3
1.4	1.2
1.2	0.9
1.0	1.0
1.0	0.9
0.9	0.9

6. Use the same process to import a chart.



Technology Tutorial: Importing Screen Shots

- 1. To import screen shots from a graphing calculator, TI Connect must be loaded onto the computer.
- 2. Link the TI-73 graphing calculator to the computer using a TI Connectivity Cable Serial for Windows® (black).
- 3. Double click on the **TI Connect** icon on the desktop.



4. Click on the **TI** <u>ScreenCapture</u> Icon.

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5. The Screen Capture window will open up. The screen shot containing whatever is presently displayed on your graphing calculator will be displayed within this window. Click on the **Add/Remove Border** icon to add a border to your screen shot.





6. Click on **Edit** on the menubar. Click on **Copy** to copy the image to the clipboard.



7. Click on the appropriate file on the menubar to open the document that will contain your imported data.

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8. Right click on this document. Click on **Paste**.

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9. The screen shot will be imported into your document as shown below.

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