

HEIGHT VS. ARM SPAN ACTIVITY SHEET

1. Take turns measuring the height (in inches) and arm span (in inches) of each group member. Record the data in the table.
2. Choose 6 of your classmate's data points and record them in your chart. Make sure you decide with your group members which data points you are choosing to ensure you have the same values in your table.

	Height (in inches)	Arm Span (in inches)
Group Member 1		
Group Member 2		
Group Member 3		
Group Member 4		
Classmate 1		
Classmate 2		
Classmate 3		
Classmate 4		
Classmate 5		
Classmate 6		

3. Create a scatter plot of your data using graph paper. Label the x-axis "Height" and the y-axis "Arm Span." Create your own scale on each axis.
4. What correlation do your data have? Discuss with your group members.

THE LINE-OF-BEST-FIT

The trend line that shows the relationship between two sets of data most accurately is called the line of best fit. A graphing calculator computes the equation of the line of best fit using a method called linear regression.

1. Press the **2nd** key and **0** to bring up the catalog. Use the **DOWN** arrow key to find **DiagnosticOn**. Highlight it and press **ENTER**.
2. Press the **STAT** key. Press **ENTER** to edit your lists of data.
3. Clear any data that is in L1 and L2. To erase a list, push the **UP** arrow to highlight a list name. Press **CLEAR** and **ENTER** to erase the whole list.
4. Enter all the values (in order) for height into L1. Type the first value, and press **ENTER** to input the next value.
5. Enter all the values (in order) for arm-span into L2.
6. Press **2nd** and **MODE** to get to the Home screen.

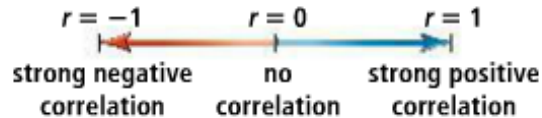
Now we are ready to have the calculator create the line of best fit for us.

1. Press **STAT**. Press the **RIGHT** arrow key to highlight **CALC**. Choose option **4:LinReg(ax+b)**. (Either Press “4” or scroll down to highlight the option and press **ENTER**.)
2. You will see LinReg(ax+b) on the Home screen. Press the **2nd** key and **1** on the number pad. L1 will appear. Press “,” which is located above the 7 button. Press **2nd** and 2 on the number pad. L2 will appear. Press “,”.
3. Press **VARS**, which is located below the arrow keys. Press the **RIGHT** arrow key to highlight **Y-VARS**. Press **ENTER**. Press **ENTER** again.
4. Your home screen should say LinReg(ax+b) L1, L2, Y1. Press Enter.
5. Record what you see:

6. What is the value of a? _____ . This represents the slope of your line of best fit.
7. What is the value of b? _____ . This represents the y-intercept of your line of best fit.

8. Write the line of best fit in slope-intercept form now that you know the slope and y-intercept:
9. What is the value of r ? _____

The graphing calculator has returned the correlation coefficient, r , which is a number between -1 and 1. IT tells you how closely the equation models the data.



If the r value is close to 1, the data lie close to the line of best fit, with a positive slope. If the r value is close to -1, the data lie close to the line of best fit, with a negative slope. If the r value is close to 0, the data do not lie close to the line.

Do you think your linear equation is a good fit for this data? Why or why not? Discuss with your group.

Create a Scatter Plot on your Graphing Calculator

Your graphing calculator can generate a scatter plot for you.

1. Press **2nd** and **Y =**. Press **ENTER**. Press **ENTER** to turn your plot On. Make your calculator says XList:L1 and Ylist:L2.
2. Press **ZOOM** and choose option **9: ZoomStat**. You should see a scatter plot of the data and your line of best fit.

Try these:

1.

- a. Enter the data below into your L1 and L2. Enter Years into L1 and Cars sold into L2. (Enter the years as years since 2000. So 2001 would be entered as 1, 2002 would be entered as 2, and so on.)

Sales of Hybrid Cars in the U.S.							
Year	2001	2002	2003	2004	2005	2006	2007
Cars Sold (thousands)	20	38	54	84	206	252	288

SOURCE: hybridcars.com

- b. Find the line of best fit using Linear Regression on your calculator. Write the equation of the line below:
- c. What is r^2 ?
- d. Create a scatter plot of this data on your graphing calculator. Draw a rough sketch of what you see below:

2.

Tips Earned by Waiter					
Hours Worked	2	3	6	8	9
Tips (\$)	36	62	120	148	165

- a. Enter the data below into your L1 and L2. Enter Hours Worked into L1 and Tips into L2.
- b. Find the line of best fit using Linear Regression on your calculator. Write the equation of the line below:
- c. What is r^2 ?
- d. Create a scatter plot of this data on your graphing calculator. Draw a rough sketch of what you see below:

