Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Core: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Balloons

You are going to be working in a group of three or four people. You will be entering your data into L1 and L2.

1) Blow up your balloon. Measure the circumference in centimeters and record it in L1. You may want to make a mark on your balloon so that you are measuring in the same place each time. You may also want to start with smaller circumferences and work your way up so that your balloon does not get stretched out.

2) Have the stopwatch ready to go and have whoever is holding the balloon release it. Time how long it takes in seconds for the balloon to deflate and hit the ground. Record the time it took for the balloon to deflate and hit the ground in L2. Be sure to release the balloon from the same height each time to keep your data consistent. Also – do not “throw” the balloon – just release it and let it do its thing.

3) Repeat this process 20 times, using a different circumference each time.

4) Make a scatter plot of your data showing the relationship between the circumference of the balloon and the time it takes to deflate.

TRY # CIRCUMFERENCE TIME TRY # CIRCUMFERENCE TIME

1 11

2 12

3 13

4 14

5 15

6 16

7 17

8 18

9 19

10 20

Questions:

1) Is there a relationship between the circumference and the time to deflate? Please explain.

2) What other variables affected the results of this experiment?

3) Sketch a picture of your scatter plot on the back and mark in the line of best fit. Find the equation for this line.

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| **Balloons** |  |
| http://education.ti.com/images/webelements/pix.gif | | |

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| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | http://education.ti.com/images/webelements/pix.gif | |  |  | | --- | --- | | http://education.ti.com/images/webelements/pix.gif | Activity Overview |  |  |  | | --- | --- | | http://education.ti.com/images/webelements/pix.gif | This activity is about gathering data to create a scatter plot and then look at a line of best fit. Students will measure the circumference of a blown up balloon and then they will time how long it takes the balloon to deflate. They will enter this information in to their lists and then graph the scatter plot. Teachers can then use the Navigator System to screen capture the graphs and discuss them. Teachers can also use the Navigator to compile all of the lists for a better scatter plot. |  |  |  | | --- | --- | | http://education.ti.com/images/webelements/pix.gif | Before the Activity |  |  |  | | --- | --- | | http://education.ti.com/images/webelements/pix.gif | Students will need to be able to create lists on the calculator and then create scatter plots from the lists. Students will also need background information on approximating a line of best fit and how to find the equation of that line. |  |  |  | | --- | --- | | http://education.ti.com/images/webelements/pix.gif | During the Activity |  |  |  | | --- | --- | | http://education.ti.com/images/webelements/pix.gif | Students need to work in groups of three or four. You may also want to talk to students about redoing data points which are "bad" like if the balloon lands on a desk instead of the ground, etc.  **Activity Downloads:**    ([file types](http://education.ti.com/educationportal/activityexchange/activity_upload_file_format.jsp?cid=US))   * [CJohnson\_Activity\_2.doc](http://education.ti.com/educationportal/activityexchange/download_file.jsp?cid=US&fileurl=Math%2FAlgebraI%2F8535%2FCJohnson_Activity_2.doc) * [CJohnson\_Activity\_2.pdf](http://education.ti.com/educationportal/activityexchange/download_file.jsp?cid=US&fileurl=Math%2FAlgebraI%2F8535%2FCJohnson_Activity_2.pdf) |  |  |  | | --- | --- | | http://education.ti.com/images/webelements/pix.gif | After the Activity |  |  |  | | --- | --- | | http://education.ti.com/images/webelements/pix.gif | After students have made their scatter plots and found the line of best fit, the Navigator System can be used to further analyze the data. One way that it can be used is by doing a screen capture of all of the student's scatter plots. This will help to foster a discussion about similarities and differences in the student data. The second way that the Navigator System could be used would be through the Activity Center. The students could send their L1 and L2 to the teacher, and then the teacher can send all of the compiled lists back to the students for further analyzation. Students can make another scatter plot with all of the data and find the line of best fit for the data. They can analyze how the line of best fit changes when they have more data points, versus just the 20 data points. Teachers could also use the screen capture again to compare the lines of best fit for the different groups to see how they are similar and different. |  |  |  | | --- | --- | | http://education.ti.com/images/webelements/pix.gif | Other Downloads |  |  |  | | --- | --- | | http://education.ti.com/images/webelements/pix.gif |  | | http://education.ti.com/images/webelements/pix.gif | | http://education.ti.com/images/webelements/pix.gif | | | | http://education.ti.com/images/webelements/pix.gif | http://education.ti.com/images/webelements/pix.gif | [http://education.ti.com/images/buttons/btn_download.gif](http://education.ti.com/educationportal/activityexchange/AlignActivity.do?cid=US&activityId=8535)[view standards alignment](http://education.ti.com/educationportal/activityexchange/AlignActivity.do?cid=US&activityId=8535)  [http://education.ti.com/images/buttons/btn_download.gif](http://education.ti.com/educationportal/activityexchange/AlignActivity.do?cid=US&activityId=8535&textbook=true)[view textbook alignment](http://education.ti.com/educationportal/activityexchange/AlignActivity.do?cid=US&activityId=8535&textbook=true)  **Subject Area:**  Math : Algebra I : Linear Equations and Functions  Math : Algebra I : Data Analysis  http://education.ti.com/images/ax_author__teacher_submitted.gif**Author:**  Cindy Johnson  **Level:**  9-12, 5-8  **Activity Time:**  2 Hours  **Device:**  TI-83 Plus Family, TI-84 Plus Family, TI-Navigator™  **Apps:**  **Software:**  **Accessories:**  **Other:**  Each group of students will need a 12" or 15" balloon and a stopwatch to time with. It also helps if students mark a line on the balloon with a sharpie so that they are measuring the circumference at the same part of the balloon each time. |