Barbie Bungee

In this activity, you will simulate a bungee jump using a Barbie doll and rubber bands.

Before you conduct the experiment, formulate a conjecture:

*I believe that \_\_\_\_\_\_\_\_\_\_\_ is the maximum number of rubber bands that will allow Barbie to safely jump from a height of 232in.*

PROCEDURE:

Complete each step below-

1. Follow the teacher’s directions to perform the in-class experiment.
2. When you have completed the data table, answer the remaining questions.

QUESTIONS:

1. Complete the data table below.

|  |  |
| --- | --- |
| http://0.tqn.com/d/toys/1/0/k/x/QuintessentialBarbie.jpgNUMBER OF RUBBER BANDS (X) | JUMP DISTANCE IN IN (Y) |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 6 |  |
| 8 |  |

1. Make a scatterplot of your data. Indicate the scale on each axis.
2. Describe the scatterplot. Be sure to mention form, direction, and strength. (And outliers if there are any).
3. Enter the data into your GDC. What is the correlation coefficient? What does this mean? Why is it appropriate to find the line of best fit?
4. In order to get a better idea of the data, we can calculate a line of best fit. Begin by drawing a line of best fit “by eye”. Find the equation of this line.
5. We would get a more accurate version of the line of best fit if we calculate the Least Squares Regression Line. Find the regression line **by hand**. After finding the line by hand, verify your line using your GDC’s linear regression function.
6. Draw the regression line on your scatterplot (use a different color than you “by eye” line.)
7. Interpret your line:
	1. What is the slope of your equation and what does it represent **in context**?
	2. What is the y-intercept of your equation and what does it represent **in context**?
8. Based on your regression line, what would you predict is the maximum number of rubber bands so that Barbie could still safely jump from 232in?
9. How do your predictions from Question 9 compare to the conjecture you made before doing the experiment?
10. **Conduct the experiment**. Did your Barbie survive? Why do you think that your prediction was correct/incorrect? What limitations existed in this experiment? How would you change this experiment in the future in order to improve its validity?

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1. **Extension:** Interpret your $r^{2}$value.