

Activity 6

Name _____

Bungee Jumping Barbie!

In this activity, we are going to play thrill-seeking Barbie. We are going to be using rubber bands to create a bungee cord, strap it to Barbie's feet, and then send her flying off of a cliff! You can do anything, right Barbie?

Here is the goal of the activity: we want to give Barbie as much excitement as possible but we don't want any lawsuits on our hands. Therefore, you need to decide how long to make your cord so that her jump brings Barbie as close as possible to the floor, but without hitting her pretty little head on the ground. No splat. That would be bad.

To do this, you need to make some measurements. As an experiment, tie rubber bands together to create bungee cords of different lengths. It is up to you how you want to create the cords. It might be a good idea to start with one cord, and keep making and longer and collecting data for each addition to the cord. For each cord, try a few jumps and use a yardstick to measure the distance Barbie falls for each jump (there are a couple different ways to measure this- it is up to you and your group to decide how).

1. Put your data in Excel: In the A column, record the un-stretched length of the bungee cord. In the B column, record the fall distance for Barbie's head. After you feel you have enough data points, paste your data below over the following EXAMPLE.

EXAMPLE:

Un-stretched Cord Length (in)	Barbie's Jump distance (in)
6	18
6	19
8	24
8	24.5
9.5	29

etc....

2. Use Excel to create a scatterplot, trendline, and function for the line. Paste the graph below.
3. Interpret the slope in terms of the example. Make sure to mention the actual slope value.
4. Interpret the y-intercept in terms of the example. Make sure to mention the actual y intercept value.
5. Interpret the coefficient of determination in terms of the example. Make sure to mention the actual r^2 value.
6. What is the correlation coefficient and how strong do you feel is the relationship between the variables?
7. Measure the height of the wall for Barbie's final jump (ask where this is going to be). Write the number below.

8. Using your answer from 7, predict the length the cord should be to give Barbie "her money's worth" for a jump from that height.
9. Given your answer in 6, how comfortable are you with your prediction? Are you going to make an adjustment to ensure Barbie's safety? If so, explain how you decided what your adjustment should be. If not, explain why not. How long is your final bungee cord going to be? (Hint: It might be a good idea to remove outliers and or bad data points- if you do, please paste your new graph below).
10. Create a cord for the final jump and perform the jump. What happened? What would you change about the cord?