

Spaghetti Bridges

Names: _____

To make sure roads are safe, engineers test materials they use. They can find information in a manageable and cost effective manner by testing models. This activity is similar to how they would test the strength of bridge beams.

Students work in pairs. Each pair needs:

- 1 paper cup with 2 holes punched on opposite sides
- 1 cupful of pennies (about 100)
- Uncooked spaghetti (about 15 pieces) OR linguine OR vermicelli



1. Thread a piece of spaghetti through the holes in the cup.
2. Using a stack of books, suspend the cup so that approximately one inch in from the ends of the spaghetti rests on the books. Placing a box under the cup will help with clean-up.
3. One of the students will carefully add pennies to the cup, one at a time, until the spaghetti breaks.
4. Record results below.
5. Repeat the above procedure with 2, 3, 4, and 5 pieces of spaghetti until at least one piece of spaghetti breaks.

X Control Variable # of Spaghetti Pieces	Y Dependent Variable # of Pennies
1	
2	
3	
4	
5	

6. Graph the data from your table on a coordinate plane as ordered pairs (x, y).

7. Look at your graphed points. Describe the relationship. Is it curved or linear?

Use the graph to answer the following questions:

1. How many pennies would be needed to break "bridges" of 6 pieces: _____ pennies

7 pieces: _____ pennies 8 pieces: _____ pennies.

2. About how many more pennies are required to break the "bridge" each time another piece of spaghetti was added? How can you tell this from your graph?

3. Extend the line or curve you have drawn so that it crosses the y-axis. Where does this occur?

Ordered pair where this occurs: (0, ____).

4. What real life meaning does this point have in relation to the pennies and the bridge?

Does this make sense? _____ Why or why not?

5. Describe in words how to determine the number of pennies you would need to break a bridge if you knew the number of pieces of spaghetti in the bridge.

6. Use your description to predict how many pennies would be needed to break a bridge of 25 pieces of spaghetti. Show your work.

7. Use your words above to write an equation that could be used to determine the number of pennies (y) needed if you knew the number of pieces of spaghetti (x).

$y =$

8. Rewrite your equation using descriptive variables. Instead of x and y , use s and p .

9. Use your equation to predict the number of pennies needed to break a bridge of 50 pieces of spaghetti.

10. EXTENSION: Repeat using linguine AND/OR vermicelli and compare the best fit equation and make conclusions.