

## Problem 1.1 - Testing Bridge Thickness

Directions:

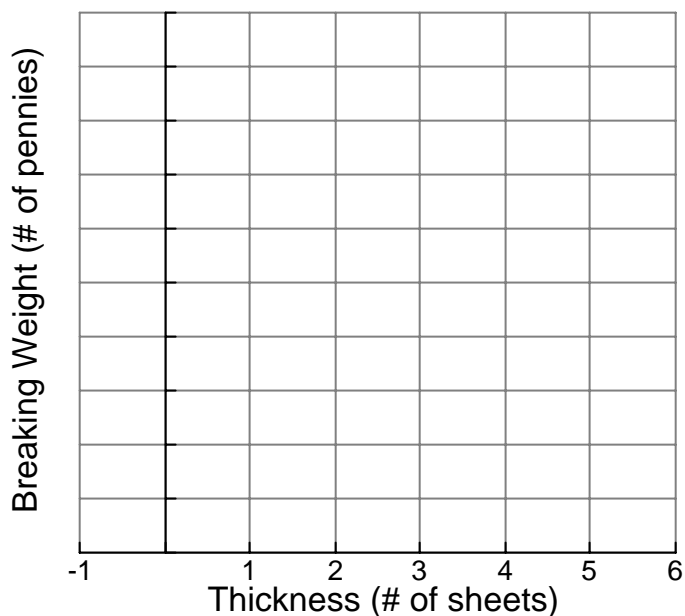
- Start with one paper strip (single layer bridge).
- Suspend the bridge by overlapping each book by 1 inch. Place cup in the center.
- Put pennies in cup one at a time. The number of pennies in the cup when the bridge collapses is the *breaking weight*.
- Repeat the process with a 2, 3, 4, and 5-layer bridge. Determine the breaking weights of each.

1.) Use the Table to record your Data

2.) Use the Graph to plot the Data.  
*Label scale for the y-axis.*

| Thickness | Pennies |
|-----------|---------|
| 0         |         |
| 1         |         |
| 2         |         |
| 3         |         |
| 4         |         |
| 5         |         |

**Bridge Thickness & Breaking Weights**



3.) a) Does the relationship between the bridge thickness and breaking weight seem to be linear or non-linear?

b) How is this shown in the table?

c) How is this shown in the graph?

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4.) Suppose you could split the layers of paper in half.

a) What breaking weight would you predict for a bridge 2.5 layers thick?

b) Explain how you determined your answer.

5.) a) Predict the breaking weight for a bridge for a bridge 6 layers thick.

b) Explain your reasoning.

c) Test this prediction. What are your results?

d) Explain why results from such a test might not exactly match predictions.