Name: _____
Date: _____
Period: _____

Lab – Paper Bridges – Beam Length

Question:

A Beam Bridge is a single span between two points. The beam is most often made of the same material from end to end, i.e. concrete, wood, steel, etc. Does the length of the beam affect its ability to support a load? _____

_____

Prediction:

Explain what you think the relationship between length and strength is. _____

_____

_____

_____

_____

Procedure:

1. Gather the following materials: 2 sheets of Copy Paper, scissors, 10 pennies, tape, 2 textbooks
2. Cut the sheet in half (longitudinal = hot dog) then fold it in half longitudinally. Tape the open edge.
3. Set the 2 text books on your table 4 inches apart.
4. Tape one strip of paper to each textbook so that one inch of you bridge is secured on each side.
5. Add one penny at a time to the center of the bridge until the bridge touches the table.
6. Record your results in the table below.
7. Repeat the above procedure but increase the span by 2 inches
8. Continue until you have tested a beam 10 inches long

Data:

| Beam Thickness | Number of Pennies Held | Mass of a Penny | Mass of Load |
|---|---|---|---|
| 4 inch span | | 2.1 grams | |
| 6 inch span | | | |
| 8 inch span | | | |
| 10 inch span | | | |

Calculate mass of load:

Mass = # of Pennies X mass of penny

Analysis:

Create a graph showing how the length of the beam affects the ability of the bridge to support mass. Remember to label each axis and show Units of Measure

Title: _____

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Conclusions:

1. What did you learn from this simple experiment? Use the data you collected to support any claims you make. Extrapolate your understanding to the construction of real-world bridges. _____

2. The bridge you created is a simple beam bridge. These are very common bridges, but they do not serve in all situations. Describe some real world situations where a simple beam bridge would not be useful. _____

3. How might you improve a simple beam bridge to serve in the situation you described above? ___