Name: _____ Class: _____

Structure Testing

Purpose:

_____

_____

_____

Equipment:

- 5 index cards (4”x6”)
- Glue (hot, white, or stick)
- Glue Gun
- Scissors
- String
- Bathroom Scale
- Spring Scale/Weights
- Flat Piece of Wood

Procedure:

Design

For each of the situations below, <u>first sketch</u> your idea, <u>then build</u>:

1. Use one index card to build a strong column that is the full height of the card (6” - the long side of the card).
2. Use one index card to make a strong beam that will span a gap of 9 cm (the gap is 9 cm wide).
3. Use the last three index cards to make a strong panel. The panel must be at least 6 cm by 6 cm and must be at least 1 cm thick.

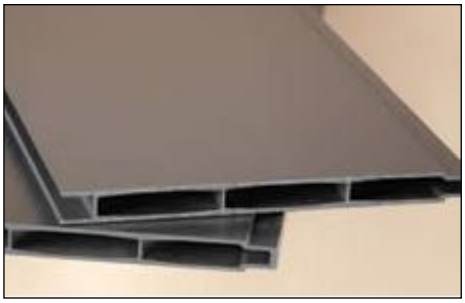
Testing

The index cards will be left to dry until your next class, at which time they will be tested as follows:

1. Stand the column upright on the bathroom scale. Using the flat piece of wood, press down on the column, watching the scale, until the column fails. Record the scale reading at failure.

2. Place the beam across a 9 cm gap between two desks. Put a loop of string around the middle and attach the spring scale to the string. Pull the spring scale until the beam fails. Record the largest force that the beam can support.

3. Place the panel on its edge on the bathroom scale (not lying flat). Using the flat piece of wood, press down on the panel, watching the scale, until the panel fails. Record the scale reading at failure.



Data:

Test Specimen	Scale Reading ( )	Force at Failure (N)
Column		
Beam		
Panel		

*If the scale is in pounds, multiply by 4.5 to get the force in Newtons.
If the scale is in kg, multiply by 10 to get the force in Newtons.

Discussion:

On a separate piece of paper:

1. Sketch your three designs and label design details (where joints were located, where any folds were, etc).
2. On your sketches, indicate where the failure location of your designs occurred.
3. Write a few sentences about each design and how they failed.
4. Write a few sentences about how you could improve upon each of your designs.
5. Explain where each design could be used to build a real-life structure.