

PROJECT ASSIGNMENT GROUP 2

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METC-111

PROCEDURE

1. We assembled the truss.
2. We attached load sensors to three of the beams.
3. We connected the load sensors to the computer.
4. We attached a load to the bottom center of the truss.
5. We took measurements on the computer.
6. We repeated steps 4 and 5 with two more loads.

MASSES USED WITH WEIGHT CALCULATIONS

mass (g)	weight (N)
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700	6.86
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500	4.90
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1000	9.80
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$$\text{weight} = \text{mass} \times 9.8 \frac{m}{s^2}$$

THEORETICAL RESULTS

mass (g)	F1 (N)	F2 (N)	F3 (N)
700	3.43	3.43	4.85
500	2.45	2.45	3.46
1000	4.90	4.90	6.93
	Tension	Tension	Compression

EXPERIMENTAL RESULTS

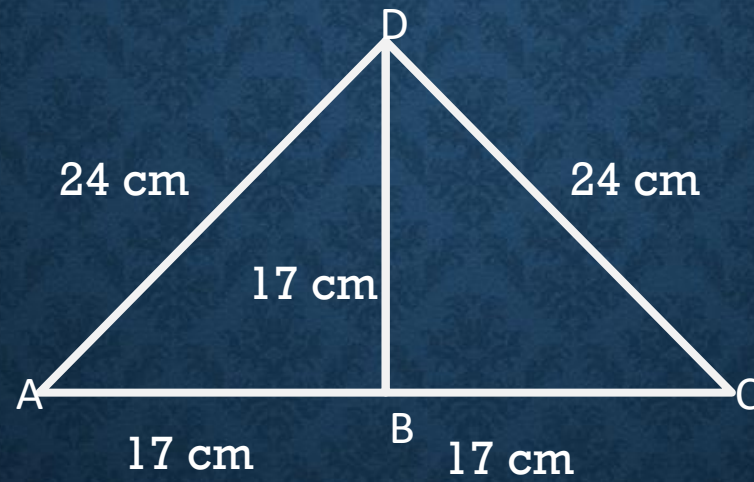
mass (g)	F1 (N)	F2 (N)	F3 (N)
700	3.23	3.24	3.36
500	2.23	2.19	3.16
1000	4.54	4.58	6.49
	Tension	Tension	Compression

PERCENT DIFFERENCE

$$\% \text{Difference} = \frac{\text{Experimental} - \text{Theoretical}}{\text{Theoretical}} \times 100\%$$

mass (g)	F1	F2	F3
700	-6%	-6%	-31%
500	-9%	-11%	-9%
1000	-7%	-7%	-6%

DIMENSIONS OF TRUSS



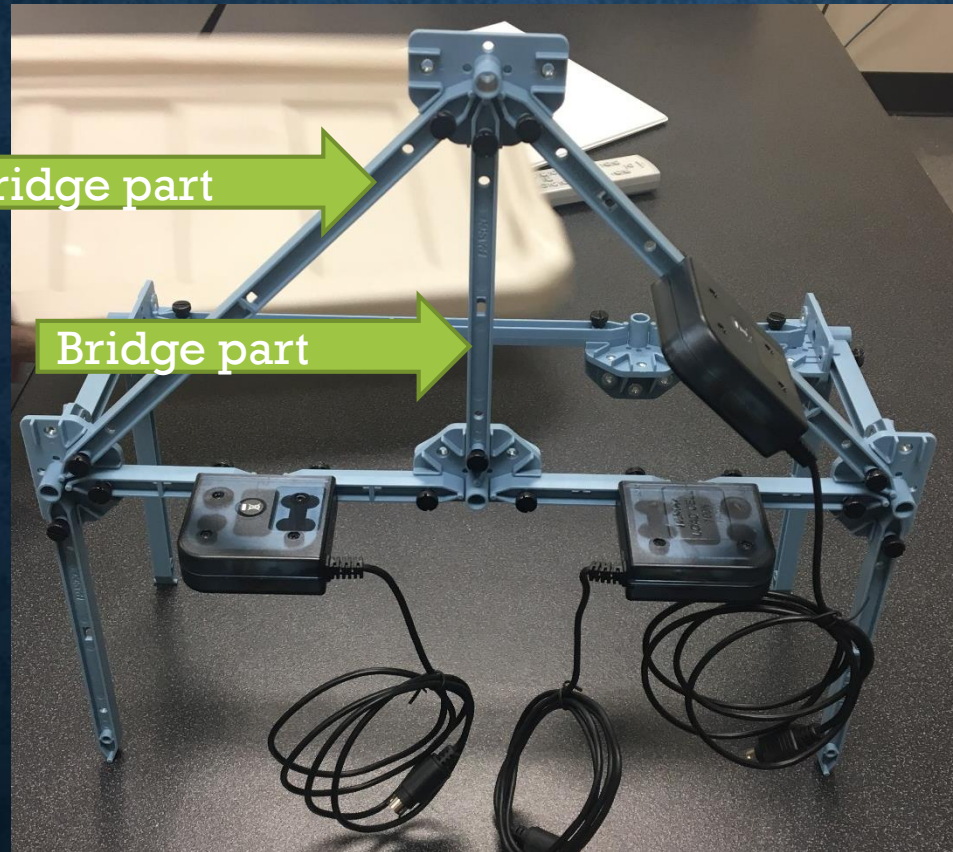
CALCULATIONS

- $F_1 = \frac{F}{2}$ (Tension)

- $F_2 = \frac{F}{2}$ (Tension)

- $F_3 = \frac{F}{2 \cos 45^\circ}$ (Compression)

EXPERIMENTAL EQUIPMENT



CONCLUSIONS

- I found the calculations and experimental results for F_1 and F_2 to be similar for all masses.
- But for 700 grams, the F_3 experimental result was 31% smaller than the predicted result.
- All experimental results were consistently, slightly smaller than the predicted results.
- The cause of the discrepancy between theoretical and experimental results could be explained by human or machine error.