

Paper Platform

Purpose: To construct a platform out of a single piece of regular $8\frac{1}{2}$ x 11 inch paper (that is handed out by ME—no changing the weight of the paper that is used), the platform can be no higher than one inch off the ground, all the paper must be used, and is built to sustain a high force of books.

Procedure:

1. Obtain the materials allowed for this project: one sheet of regular weight and size paper, and some type of glue. (The platform should be 95% paper and 5% glue)—if there are questions about this requirement, please ask me before you turn it in
2. Brainstorm about a shape of platform remembering that the height can be no more than 1 inch, no shorter than $\frac{3}{4}$ inch
3. You will get two chances to stack books on your platform in class.
4. The top five platforms that hold the greatest number of books will receive maximum points, and all other grades will be determined by the ratio of books that your platform holds versus the average of class winners.
5. If you choose to work in pairs (2 or less) only one platform will be required per group, but each member must turn in their own lab write up. Make sure that your TYPED lab write up contains the following information:
 - a. *Purpose*
 - b. *Procedure*: An account of the process of your design, and how it was constructed. Make sure to include all the lengths and widths of the legs of your platform. How many strips of paper were used to construct the legs, and the type of glue used to bond the platform together.
 - c. *Data/Observations*: Suggestions about what you thought made your platform design the one that you chose.
 - d. *Data Analysis*:
 - i. A sketch that shows how the shape of platform was created, and then a sketch of the final platform including the length x width x height.
 - ii. The number of points earned from your platform performance in class
 - e. *Conclusions*: Make sure that your conclusion answers the following questions, and include a paragraph with suggestions or changes you would make for next time.
 - i. What are the contact forces acting on the platform?
 - ii. What are the long range forces acting on the platform?
 - iii. When does the platform experience an unbalanced force?
 - iv. Construct a free body diagram showing the forces acting on the platform.
 - v. What is the difference between the mass of the books and the weight of the books?
 - vi. Determine the mass of one physics book, the weight of one physics book, and the weight of the books that the platform sustained before it collapsed.
6. Your platform will be due first, and then you will receive an additional class period before your write up will be due.
7. The performance of your platform will count for 60% of your grade, and your individual lab write up will count for 40%.
8. Any student or group caught cheating will receive a 0 for their platform, and will not be able to receive higher than a 20.

Rubric for book stacking

Avg of top 5 number of Books sustained in class:

Number of books your platform sustained:

Number of points received out of 20:

Platform is 95% paper and 5% glue:

Platform height is between $\frac{3}{4}$ to 1 inch:

