Structural Design! Design Brief

Activity:

Tamanend Engineering Inc. is now hiring new structural analysts. Lucky for you it is located right here in Warrington, Pennsylvania. They have created several structures including skyscrapers, bridges and dams. Tamanend Engineering Inc. specializes in towers. They have one problem; their structural analyst just quit and they are looking for someone with the skills and knowledge to test their structural designs. They're looking for a new analyst with great knowledge of forces and structural designs. They should also be problem solvers and critical thinkers. Their analyst could be you! Give us a sample of your work and maybe you can join our team!

Challenge/Problem:

- Research, design, build and test a model of a wooden tower that holds the most amount of weight.

Criteria:

Independent Work:

√ Must research forces, joints and structural stability
√ Must complete 4 thumbnail sketches

Partner Work:

√ Must sketch 3 views showing actual dimensions of picked tower design
√ Must draw 3 views showing actual size and dimensions using Microsoft Word
√ Construct tower
√ Test tower and calculate efficiency
√ Response and evaluation

Constraints:

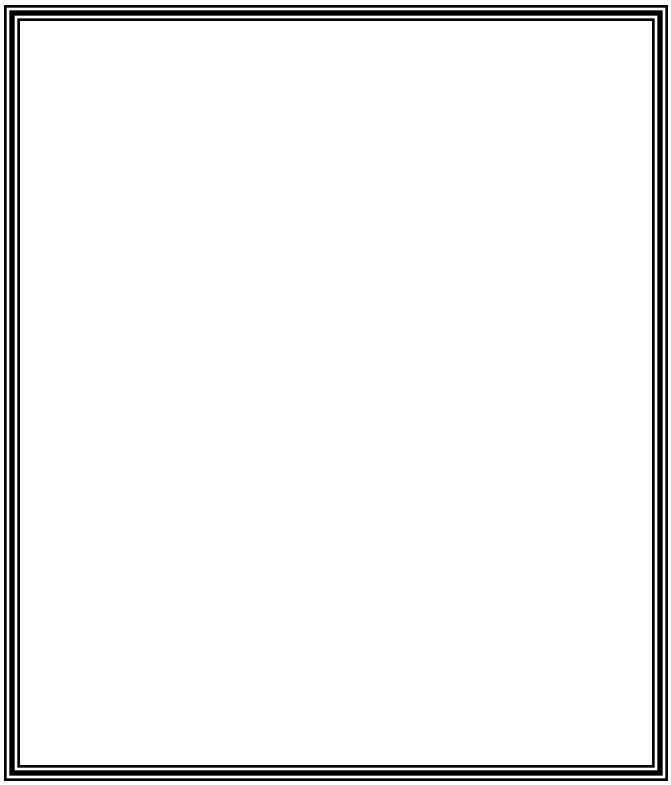
√ Plan and develop your tower using the Problem Solving Process
√ Must use 14 feet or less of Bass Wood (Seven 2' long sticks)
√ Must use wood glue in building of tower
√ Center of tower free of obstructions
√ Maximum dimensions: Height: 8", Base Width: 3"-6", Top Width: 2"-3"

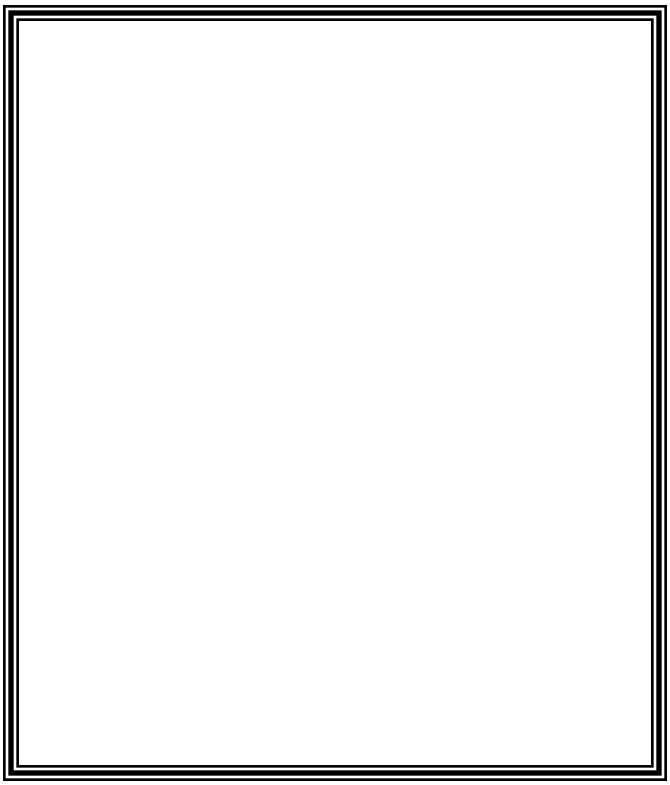
What to turn in:

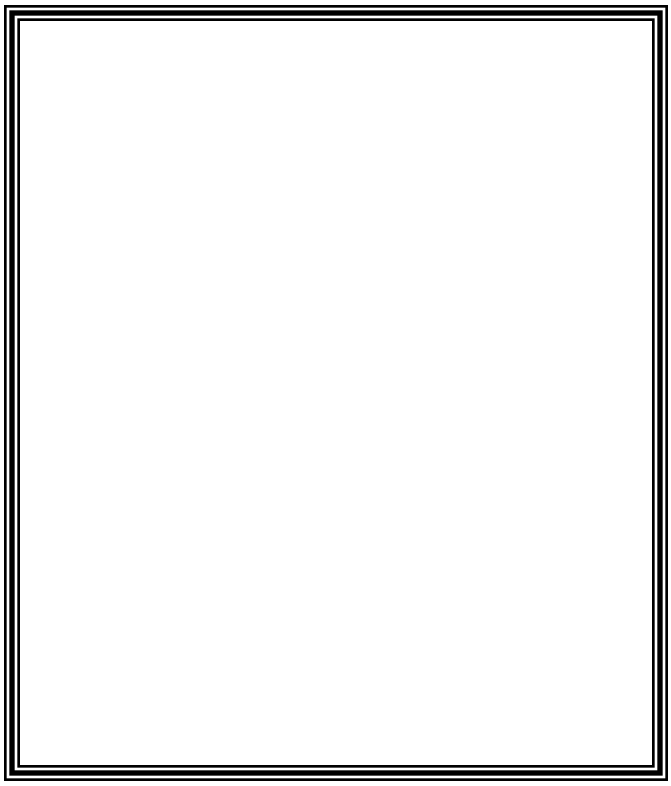
Throughout the project you will turn in the following: Forces Structures Video Worksheet, Thumbnail Sketches, 3 View Sketch, 3 View Computer Drawing, Tower Poster with Efficiency Calculation, Response and Evaluation Blog

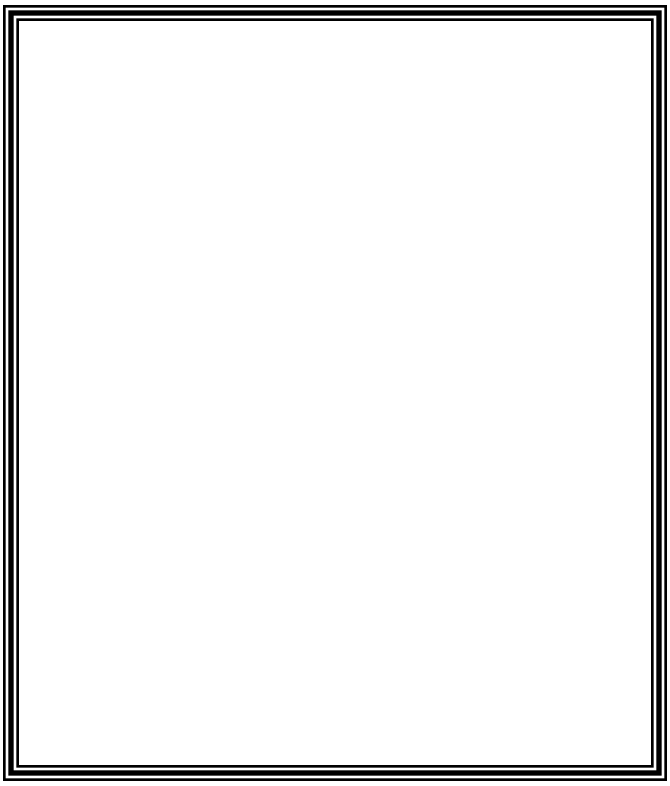
Name:
Section #:
Date:

Tower Thumbnails









Name:
Section #:
Date:

Tower Sketch

Name:
Section #:
Date:

Tower Truss Designs

Research using the Internet the following truss designs. Draw each truss below:

1. Warren:

2. Pratt

3. Howe

4. K Truss:

Name:
Section #:
Date:

Tower Estimations

Look at all the numbered towers on the front desks. After taking a look at all of the towers use your knowledge of structural design to estimate how each tower will do during testing. On this paper order the towers in how much they will hold. Write the numbers down.

1. _____ Will hold most weight
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____ Will hold least amount