

TOWERS – Science Research Assignment

***** Sketch due Mon Oct 3 *** Scaled drawing due Mon Oct 17*****

*****Competition on Mon Oct 24 *****

Description: The objective of this assignment is to design and build the highest efficiency tower capable of supporting a load at **least 400 mm above a testing platform**. This is an engineering feat, so failure to adhere to the specifications below will cause towers to be ranked after those that do.

1. Materials

- a) The tower is to be a single structure constructed of wood bonded by glue. No other materials shall be used. Bamboo is not wood. Particle board, wood products, or commercially laminated wood may not be used.
- b) The entire tower must be constructed from wood pieces $\frac{1}{4}$ in x $\frac{1}{4}$ in or less in cross-section. They may be any length.
- c) Any type of glue may be used.

2. Construction

- a) Unlimited lamination (bonding together layers of wood) by the students is allowed, however commercially laminated wood is not allowed.
- b) The tower shall not be coated with any material such as paint, stain, or glue.
- c) The base of the tower must be constructed so that it spans an opening 200mm x 200mm square in the testing platform.
- d) The tower must be designed to support a 50mm x 50mm square x 20mm thick loading block at its top. All parts of the loading block must be a minimum of 400 mm above the testing platform before the load is applied.
- e) The tower must be a minimum of 400mm high. There is no maximum height.

3. Testing

- a) Students must **wear goggles** for eye protection during loading and testing of the tower.
- b) Students will position the tower and the loading block with chain, attach the bucket to the chain, and add sand to the bucket.
- c) **No mass larger than 15kg will be applied.**
- d) Towers will be tested to destruction or to the maximum load of 15 kg, unless student call a “STOP” at any point to preserve the tower for posterity and/or grandchildren.

4. Scoring

- a) The score will be determined by the structural efficiency equation:
Load supported(gm)/mass of the tower (gm)
- b) Towers that do not meet the specifications will place after those that do.