**STRUCTURAL DESIGN CHALLENGE**

**Challenge:**

- Build an aesthetically pleasing, stable structure with the highest possible structural efficiency.

**Review:**

- Aesthetics: The properties of an object that make it pleasing to the senses.
- Stability: The level of a structure’s ability to maintain its shape and position.
- Structural Efficiency = \( \frac{\text{Maximum Mass Supported}}{\text{Mass of Structure}} \)

**Task:**

- You will first design a structure – draw and make notes, one copy per group.
- You will then build your structure – keep the challenge in mind.
- Finally, you will test the structure – see notes below.

**Timeline:**

- You will have 4 periods to work:
  - Period 1:
    - Discuss the task as a class
    - Form a group of approximately 3 students
    - Design your structure (start build if ready)
  - Periods 2 and 3:
    - Build your structure
  - Period 4:
    - Test your structure
- You may also do work at home in between the periods.
**Supplies:**

- Several supplies will be available to you:
  - Straws
  - White Glue
  - Popsicle Sticks (given 50)
  - Glue Sticks
- You may bring additional supplies from home, but all structural support must come from popsicle sticks or straws.
- You may also use certain other supplies you can find around the room, provided you ask first.

**Criteria:**

- Your structure can not be a mass structure.
- The masses must be placed on your structure at a location at least 25cm off the ground.
- Your structure may not be more than 15 cm wide at any part of the base.

**Testing:**

- You will first weigh your structure.
- You will then put masses on the structure, one at a time, until the structure fails.
- You will be required to document your test results on a worksheet provided.
- There will be a “twist” to the test scenario that you will not be informed of prior to testing; it will have to do with the stability of your structure.
**Grade:**

- Your grade will be determined as follows:
  - 25% - Stability Performance
  - 25% - Structural Efficiency (scaled based on grade 7 average)
  - 25% - Test Documentation
  - 25% - Aesthetics (scaled based on class structures)
  - -10% for each criteria broken or step not followed