

Mystery Architecture B/C

1. **DESCRIPTION:** Students will design and build a device for testing based on instructions and materials provided at the beginning of the event.

A TEAM OF UP TO: 2 APPROXIMATE TIME: 50 minutes EYE PROTECTION: Yes

2. **EVENT PARAMETERS:** Each team may bring 1 pair of scissors, 1 linear measuring device, a pencil, and 1 pair of pliers. No other materials, tools, notes or resources are permitted.

3. **THE COMPETITION:**

- a. Each team will be given a bag containing the same materials, instructions as to the type of device to be constructed and scoring method. The students will not know the task until they begin the competition.
- b. Examples of materials that may be provided include, but are not limited to paper cups, drinking straws, spaghetti, paper clips, string, tape, paper, thumbtacks, rubber bands, binder clips, craft sticks, aluminum foil, cling wrap, wire or similar items. Only those materials contained in the bag may be used to build the device. The bag and instructions must not be used in the construction. No other materials or adhesives may be part of the finished device.
- c. Load supported – an identical load of the same dimension and weight will be provided to teams for testing. When finished building, teams will remove the load.
- d. The back of the instructions or a separate sheet of paper supplied by the Event Supervisor must be used to draw a sketch of the design. This sketch must be submitted when testing.
- e. The devices to be built are limited to a tower, bridge, or cantilever.
 - i. If a cantilever is to be built, the event supervisor will designate the location of, or supply the fulcrum, and provide a counterbalance.
- f. The instructions must identify a Primary Dimension, a Secondary Dimension, where the device must support a load, and the required duration of load support.
- g. Unless specifically stated in the instructions, devices must be freestanding and must not be attached to a tabletop, floor, ceiling or any other support.
- h. Testing. When finished building, the students must load from their device under the event supervisor's supervision. When directed by the event supervisor, the students will place the official load in/on the device.
- g. Only participants and the event supervisor are allowed in the event area. Once in the event area, they must not leave or receive outside assistance, materials, or communication.
- h. The supervisor will review with the team the data being recorded on their scoresheet.

4. **SAMPLE TASKS & PRIMARY DIMENSIONS:**

- a. For a tower, the Dimensions for measurement may include:
 - i. span of the base.
 - ii. height to the top of the supplied load or the top of the load support point
 - iii. mass of structure
- b. For a bridge, the Dimensions for measurement may include:
 - i. span of the supports (inside of span).
 - ii. height to loading point.
 - iii. mass of structure
- c. For a cantilever, the Dimensions for measurement may include:
 - i. from the fulcrum to the end of the cantilever,
 - ii. from the fulcrum to the closest point of the load.
 - iii. mass of structure

5. SCORING:

- a. Highest or lowest score wins depending on scoring instructions.
- b. Measurements will be taken by the event supervisor as described in the scoring instructions before loading:
 - i. Primary and Secondary dimensions will be measured in cm to the nearest 0.1 cm.
 - ii. Structure mass will be taken in grams to the nearest 0.1 gram.
- c. Devices will be ranked as follows:
 - i. Tier 1: Devices which support the load will be ranked in order of the Primary Dimension.
 - ii. Tier 2: Devices which do not support the load will be ranked by Primary Dimensions. Not supporting the load is defined as the load or its underlying material contacting the table or inability of the event supervisor to measure the height due to movement of the load.
- d. The Structure mass followed by Secondary Dimension will be used as a Tie Breaker if necessary.