

## Mystery Build

1. DESCRIPTION: Teammates will build the device specified at the start of competition using only the allowed materials. For a miniSO tournament, teams will be given a materials list prior to competition.  
A TEAM OF UP TO: 2                      EYE PROTECTION: No                      APPROXIMATE TIME: 50 min
2. EVENT PARAMETERS: One standard 30 cm (12") ruler, one tape measure and one pair of scissors. (Satellite/traditional format)
  - a. miniSO: Each teammate is allowed to have the stated materials. Competitors are not allowed to use any other electronic device other than to view the exam and record their answers.
3. THE COMPETITION:
  - a. miniSO format – Event supervisors will provide the materials list of common household items that will be used for the construction. Examples include: printer paper, masking tape, paper clips, cotton swabs, etc. The number or amount of each item needs to be specified. Materials must be safe for teammates to use at home.
  - b. Satellite/traditional – Event supervisors will provide the materials for each team.
  - c. No matter the format, the students will not know the task until the start of competition. An instruction sheet describing the device to be constructed will be provided when competition begins.
  - d. The instruction sheet will state the dimension that will be measured – height, span, etc.
    - i. Satellite/traditional – Event supervisors are able to add a load to the device. The instruction sheet will state if a supporting load will be added and the duration the device must hold that load.
    - ii. miniSO – Event Supervisors will decide if each teammate is able to build or if one teammate will build and the other will provide direction and additional ideas for construction. If both teammates build, the event supervisor will determine if only the best score is submitted or if both scores are submitted and averaged. This will be stated on the instruction sheet.
    - iii. Unless stated in the instructions, the device must be free-standing. It will not be attached to a tabletop, floor, ceiling, or any other support.
  - e. Load support (satellite/traditional) – If the device will be tested for load support, an identical load of the same dimension and weight will be provided to teams for testing. When finished building, teams will remove the load.
  - f. At the end of the allowed time, or when the teammates are ready the device will be measured according to the dimension specified in the instructions.
    - i. miniSO – A picture or video will be taken that shows the measurement of the device(s). The measurement must be easily visible in the photo or video. This will be sent to the coach and the coach will upload it to the tournament director's assigned folder.
    - ii. Satellite/traditional – The event supervisor will have teams bring the device to a standard final testing area or will do the final measurements at their station and will identify when to place the load on the device.
4. SAMPLE TASKS AND DIMENSIONS:

- a. For a tower or arch, the dimension could be the height from the base to the highest point of the tower or arch.
  - b. For a bridge, the dimension could be the maximum span between the closest inside supports. If the bridge deck touches the base, that is now considered a support and would be used as such for measurements.
  - c. If adding a load support (satellite/traditional), the device could be tested if it will withstand the load for a specified time and/or it could be measured from the base to the highest point of the load.
5. SCORING:
- a. Highest or lowest score wins (depending on instructions).
  - b. All tournament formats – All devices will be measured according to the instructions provided. Measurements will be recorded in cm to the nearest 0.1 cm.
    - i. miniSO – Number of devices built will be stated on the instruction sheet.
    - ii. Satellite/traditional – One device will be constructed by the team.
  - c. Load support (satellite/traditional) – The device will be measured, prior to placing the load, from the base to the point where the load will be applied. After placing the load, the device will be measured again, if it withstands the load. If the device will be tested to withstand the load for a specified time, the 2<sup>nd</sup> measurement will take place at the end of the time provided.
  - d. Ranking of teams
    - i. miniSO – Teams will be ranked based on the measurement outlined in the instructions (height, span, etc). Tiebreakers could be the least amount of difference between the two individual device measurements (if both teammates build a device). Otherwise the tiebreaker will be determined by the event supervisor.
    - ii. Satellite/traditional – Varies if a load support component is added
      1. If the event supervisor chooses not to add a load, then devices will be ranked similar to the miniSO format (1 device per team). Tiebreakers will be the fastest team to have their device ready for testing.
      2. Devices with a load support will be ranked as follows:
        - a. Tier 1: Devices that withstand the load will be ranked on the minimum displacement after adding the load. Tiebreakers will be the fastest team to have their device ready for testing.
        - b. Tier 2: Devices where the load or underlying material contact the table/base will be ranked in Tier 2 according to the measurements outlined in 5.d.ii.1.