

MISSION POSSIBLE

Description:

Participants will design, build, bring and test a Rube Goldberg-like Device, which incorporates up to 20 unique Action Transfers, and uses up to five Forms of Energy in accomplishing a given task in two (2) minutes. The task will be identical for each team. Devices will be constructed prior to the competition.

Number of Participants: 2-3

Approximate Time: 10 minutes (Set-Up) & 5 minutes (Competition)

The Competition:

1. Teams will complete one the following tasks with their device:
 - A. Make a loud sound at the end of one minute (maximum duration 5 seconds).
 - B. Raise a flag at the end of 2 minutes.Task A will be done in even years, while task B is done in odd years.
2. The device will be started by some action of the team such as switching a switch, pushing a button, dropping an object, etc. Once the device is started the team must step back and wait behind the line designated by the Supervisor.
3. The device must fit inside an imaginary box 2m long x 1m wide x 1.5 m high. Please note that this is a large dimension; however make certain that your device will fit through a single door opening. The device may use ambient room light but must not depend on direct sunlight to operate. All other sources of energy and actions must take place within the imaginary box before, during and after the device's operation.
4. The task must be accomplished as close to 2 minutes as possible. Only home made timers can be used (no store bought clocks or timers).
5. Points awarded for each UNIQUE ACTION TRANSFER, which do the following:
 - A. Create a unique action.
 - B. Cause a subsequent action that contributes to the completion of the task.
6. Points will also be awarded for each of the following forms of energy used: electrical, mechanical, heat, chemical, or electromagnetic (light, laser, infra red, etc.). No electric device may have or use an electric potential difference of more than 9 volts.
7. Teams must submit a flow chart to the Event Supervisor, before the device is set up, that describes the sequence in which the Action Transfers will occur and lists the Forms of Energy used. Scoring will be based only on the Action Transfers and Forms of Energy



contained on the flow chart. The ONE PAGE flow chart must be easy to follow (well organized, neatly done, may contain diagrams and brief text).

- Each device must pass a safety inspection BEFORE operation. Uncontrolled or hazardous non-shielded falling of launched objects, hazardous materials or spills, hazardous flammable substances, faulty wiring or any other potential hazard can lead to disqualification.

Scoring:

The scoring is based on the number of Unique Action Transfers and Forms of Energy used in the task completion, are successfully accomplished by the device and are on the flow chart. The term unique means that a particular Action Transfer can count only the first time that it is used. Identical Action Transfers of the same type are allowed but not scored. For example: a rolling ball could flip a switch is an Action Transfer and a series of cascading objects (dominoes) that cause the next action would represent ONE Action Transfer. The rolling ball and the dominoes could be used again, but not scored. Points will be awarded as follows:

10 points awarded for each successful unique action transfer

20 points awarded for each form of energy used (maximum of 5)

50 points awarded for successful completion of the required task

7 points awarded for the sound at 60 seconds (+/- 5 seconds)

Penalties:

Subtract 1 point for each second over or under the two-minute time limit to accomplish the required task. Subtract 10 points for each time the device stops and must be restarted. High score wins.

NOTE: The device may not be restarted without the event supervisor's permission. Any student contact with the device without the supervisor's permission can lead to disqualification. Subtract 1 point for each object that falls out or off the imaginary box (up to a maximum of 7 points).

