

1. **DESCRIPTION:** Teams will prepare and bring materials to build a device on site to complete a task.  
**A TEAM OF UP TO:** 2                      **IMPOUND:** Yes                      **APPROXIMATE TIME:** 60 minutes

2. **REQUIRED SAFETY EQUIPMENT:** Safety spectacles/goggles with side shields.

3. **EVENT PARAMETERS:**



- a. **Challenge** – The **challenges** (Tipping the Scale and Coin Sorter) will be **posted** on the national web site.
- b. **Device** – Teams will complete construction of their device during the competition, while making adjustments to meet the parameters of the Final Directions. Portions of their devices may be pre-assembled; as long as the components fit in the materials box. Devices must be started by a single action (push a button, release a weight, etc.) unless otherwise specified by the Challenge. The device must accomplish the Challenge by itself, without any outside control, outside influence or outside energy supply of any kind.
- c. **Impound** – Teams will prepare and bring a **Materials Box** containing all construction materials that will be **impounded** before the event competition begins.
- d. **Schedule of Challenges** – Only **Tipping the Scale** will be used at regional tournaments. After impound at the state and national tournaments, the event supervisor will announce which one of the two Challenges (**Tipping the Scale or Coin Sorter**) is to be completed.
- e. **Final Directions** – **Additional variable** parameters for the device will be given to the Teams as they enter the construction area on the day of the competition.
- f. **Mystery Material** – A Mystery Material supplied by the Event Supervisor must be significantly incorporated in the operation of the device. The Mystery Material must be used such that, if it were removed from the device, the device would not function as intended.
- g. **Demonstration** – The Team will demonstrate the device to the Judge(s) for scoring.

4. **CONSTRUCTION:**

a. **Materials:**

- i. Construction materials (except for the Mystery Material(s) and any Supplied Materials) are restricted to those brought in the Materials Box. The outside dimensions of the Materials Box may be no greater than 26cm x 31cm x 46cm when closed (e.g., a common 10 ream printer paper box). The box may be made of any material. The lid must close completely with all materials in the box. The box may be used as a construction material.
- ii. The Challenge may include lists of Required Materials (brought by the team) and Supplied Materials (provided by the event supervisor).
- iii. Required Materials must comply with the materials specifications given in the Challenge. Supplied Materials and Required Materials must remain unmodified during construction and running of the device, unless otherwise stated in the Challenge or Final Directions. Unmodified materials may not be painted, taped, glued, bent, cut, pierced, smashed or altered in any way before or during construction, unless otherwise stated in the Final Directions. For example, if the Challenge specifies a “tennis ball”, you should be able to remove a tennis ball from its packaging tube and place it directly in the device without doing anything to the ball.
- iv. The Final Directions will include at least one **Mystery Material**. Unless otherwise stated in the Challenge or Final Directions the Mystery Material(s) must remain undamaged during construction and running of the device so they may be re-used by another Team.
- v. The Team must bring any Required Materials (if any) and may bring additional allowed materials to construct their device.
- vi. Teams may use only commercially available batteries labeled with their voltage by the manufacturer. Electrical potential between any two points on the device must not exceed 13 volts.
- vii. **Any materials or designs not explicitly prohibited by the general rules, challenge rules, or safety constraints are fair game for competition.**

b. **Tools:**

- i. All forms of glue are forbidden at the event site. Pre-glued components are permitted.
- ii. Tools may be brought in a separate container, which need not be impounded. Tools may not become part of the device unless they have been impounded in the materials box.
- iii. Electrical or battery operated power tools may not be used.



## JUNKYARD CHALLENGE (CONT.)

Read the General Rules in the manuals and on [www.soinc.org](http://www.soinc.org) as they apply to every event.

### c. Safety:

- i. All competitors must wear safety spectacles with side shields during construction or demonstration by any competitor. Teams without safety spectacles with side shields will not be allowed to compete.
- ii. Acids, bases and flammable liquids may not be brought to the competition.
- iii. Tool or material use deemed unsafe by the event supervisor will be stopped (no penalty first time).
- iv. Teams should feel free to ask the Judge(s) about the safety of their device during the construction period. Immediately prior to demonstrating their device, the Judge(s) will ask the team to explain its operation. If the Judge(s) deems any part of the operation unsafe the team will be given 10 minutes, without penalty, to resolve all safety issues to the Judge's satisfaction. If the device is still considered unsafe after the 10 minutes, it will not be allowed to operate and the Team will receive participation points only.
- v. Only lasers with "Caution" labels are permitted according to the posted SO guidelines. Lasers with "Warning" labels are prohibited.
- vi. Parts of the device may not break off during demonstration if doing so causes a safety hazard.

### 5. THE COMPETITION:

- a. The event may be open for viewing by the public if all teams construct at the same time, otherwise the event will be run as a closed event.
- b. Construction begins and ends as directed by the Event Supervisor. Each team will have **30 to 45 minutes**, as specified in the Challenge or Final Directions, to construct their device. Teams may not modify their device after the construction period has ended. There may be a delay between the completion of construction and demonstration time. Devices should be designed with this in mind. Teams that complete construction early may be judged early.
- c. Only Teams and Judges are allowed in the event area while Teams are competing. Once Teams enter the event area to compete, they may not receive outside assistance, materials or communication. If a Team member leaves the event area before finishing, they may not return except as allowed by the Event Supervisor.
- d. Challenges or Final Directions may require devices to be confined within a specific area on a floor or tabletop during operation. The device may not be taped or mounted to the floor, table, or competition surface.
- e. Teams will be allowed a maximum time to complete the Demonstration, as specified in the Challenge. Actions that occur after the maximum time will not be included in the score. Teams may not use timing devices to measure the performance of their device while it is being demonstrated.
- f. Team members may not touch or influence the device while it is operating, unless specifically allowed by the Challenge or Final Directions.
- g. Tools may not be used in the demonstration of the device.
- h. Touches to adjust the operation of the device during the Demonstration Time will be penalized by 5-10% of the score per touch. The percentage will be posted within the rules of the specific posted challenge instructions.
- i. An accomplished Challenge for scoring purposes will be described in the posted Challenge instructions.

### 6. SCORING:

- a. The Challenge instructions will describe the scoring system and will include tiebreaker details for each scoring tier. The Final Directions may contain minor changes to the scoring tiers.
- b. Scoring will be divided into four tiers:
  - i. Tier #1 – Challenge accomplished and device and team meets all requirements.
  - ii. Tier #2 – Challenge not accomplished but device and team meets all requirements.
  - iii. Tier #3 – Challenge accomplished but device or team does not meet all requirements.
  - iv. Tier #4 – Challenge not accomplished and device and team does not meet all requirements.
- c. Teams that impound a box but fail to attempt construction of a device during competition will be considered a No Show.

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