BUNGEE DROP C

Nebraska Science Olympiad Rules 2026

1. **DESCRIPTION**: Each team will design one elastic cord to conduct drops at a given height(s) and attempt to get a mass placed in a bottle as close as possible to, but without touching, a landing surface.

A TEAM OF UP TO: 2 **APPROXIMATE TIME: 10 minutes**
EYE PROTECTION: B **IMPOUND: Yes** **CALCULATOR: Class II**

2. EVENT PARAMETERS:

a. Each team must impound only one elastic cord, calibration data (if prepared), and tools. **The calibration data are the only papers or notes that the competitors may bring into the competition area and must be impounded.** Any tools used by teams to confirm heights, lengths, or mass during the time given for preparing their two drops must also be impounded. Electric and electronic tools are allowed.

b. Teams may bring up to two Class II calculators, which do not need to be impounded.

c. After impound, the event supervisor must provide the
   i. drop height value and the bonus drop value
   ii. light and heavy mass values
   iii. light and heavy mass lengths
   iv. drop instructions.

d. Teams must be able to answer questions regarding the design, construction, and operation of the device per the Building Policy found on www.soinc.org.

3. CONSTRUCTION PARAMETERS:

a. Teams must provide one elastic cord to be used for both drops that terminates with a circular closed metal ring with an inner and outer diameter of 1.9 +/- 0.8 cm (e.g., a key ring) that will not open.

b. The cord may consist of more than one material (contest rubber, nylon, latex tubing, thread, sewing elastic, metal springs, etc.) and more than one strand.

c. No physical modifications may be made to the elastic cord once it has been impounded, with the exception of marking drop locations on the cord before the drops. Physical modifications after impound constitute a construction violation.

d. Elasticity Test: While being suspended vertically, the **bottom 0.50 m of the cord, not including the metal ring, must stretch to at least 1.00 m** when a single 500 g mass is attached to the metal ring and return to approximately its original length after the mass is removed.

e. No “self-limiting-brake” mechanisms such as a separate, parallel, non-elastic strand that “brakes” the fall of the mass with little to no rebound are used.

4. THE COMPETITION AREA

1) **Mass Weights**
    - **Supervisors will supply a light mass and a heavy mass** that will each be composed of 500-591 mL plastic bottle, mass inside of the bottle, and an attachment mechanism (hook and a carabine) that will connect the team's bottom cord ring to the bottle. When hung, the masses including the attachment mechanism will have a height of at most 35 cm.
    - **Light Mass** is between 100 g and 300 g increments of 1 g.
    - **Heavy Mass** will be between 200 g to 300 g HEAVIER than the light mass.
    - **Attaching the Mass:** Mass weights will be in a 500-591 mL bottle with a hook as well as a carabiner that will connect to the team's bottom cord ring.
    - **Weights** of the Mass weights for 'light' and 'heavy mass" will be shared at the beginning of the session.
2) **(DH) Drop Height**
    - Drop height will be between 2.00 and 5.00 meters inclusive at an interval of 10.0 cm.
    - Will only be shared at the beginning of the session.
3) **(BTDD) Bonus Target Drop Distance**
    - The Bonus Distance will be 20 cm wide and is at least 2 meters from the floor.
4) **Elasticity TEST:**
    - The stretch test will use the LIGHT MASS.
    - While being stretched vertically, the bottom 0.50 meters of the cored, not including the metal ring, **must stretch at least ONE METER when a single 500g mass is attached to the metal ring** AND it must return to approximately its original length after the mass is removed.
    - For an example of this test, watch the first 1.5 minutes of this youtube video: https://www.youtube.com/watch?v=gWC1dU8rnbA

5. THE COMPETITION AND SCORING

1) **Teams will be given a total of 3 minutes to prepare their device in the holding area, followed immediately by 7 minutes to complete up to TWO drops at ONE height and the bonus drop if earned.**
2) **(DS) Drop Score** =the distance between the lowest point of the mass and the landing surface.
    - Drops that his hits the surface will earn a score of ½ the drop height
    - **(HMBS) Heavy Mass Bonus Score :**
        - *Attempt on 2nd Drop Only.*
        - If used AND it does not hit the landing surface, **-20 points** will be added to the DS.

3) **(BD) Bonus Drop**
    - *Offered ONLY if either of the first two drops HS is between 0 and 20 cm (30 cm at regionals.)*
    - If the bottom of the mass is dropped within the distance of the BTDD at its lowest point on the bonus drop, **BDS = -15 points. Otherwise, BDS = 0.0 points.**

4) **Final Score = DS + HMBS + BDS**

5) **Devices will be placed in tiers as follows:**
    - Tier 1: Device meets all construction parameters for all drops.
    - Tier 2: Device still has construction parameter violation(s) during any drop.
    - Tier 3: A team with its device and/or tools not impounded or uses calibration data notes that were not impounded.
6) **Tiebreakers**
    - 1st: Whether a team succeeded in the bonus drop.
    - 2nd: The team used a heavy mass.
    - 3rd: The team with the lowest individual drop score for any of their drops (not including bonus drop).
    - 4th: Lowest non-scored drop score

Recommended Resources: The Science Olympiad Store (store.soinc.org) carries a variety of resources to purchase; other resources are available on the Event Pages at soinc.org