

Marshmallow Catapult

1. **DESCRIPTION:** Teams will build in advance a device constructed out of specified materials to launch a marshmallow at a target placed on the floor. The goal is to land as close to the center of the target as possible.
2. **ESSENTIAL STANDARDS ALIGNMENT:** 3.P.1, 4.P.2, 5.P.1, Science as Inquiry
3. **TEAM OF UP TO:** 2
4. **MAXIMUM TIME:** 5 min.
5. **TEAMS:** Teams must bring their catapult and safety glasses.
6. **EVENT LEADERS:** Must provide full-sized Kraft Jet-Puffed marshmallows, score sheets, tape measures, and targets.
7. **SAFETY REQUIREMENTS:** Teams must wear safety glasses throughout the event.
8. **IMPOUND:** Yes, all devices will be impounded prior to any launches.
9. **THE CATAPULT:**
 - a. Energy may be provided by one mousetrap (no rat traps) and any number or kind of rubber bands. These must supply all the energy for launching the marshmallow.
 - b. The lever arm and base must be non-metallic. No energy from these should be provided to the launch.
 - c. The device must have a trigger or switch that can be activated by a team member using a pencil or string to start the launch. Students cannot hold the base steady while they are launching.
 - d. No part of the catapult is allowed to be higher than 60 cm from the floor when the launch is triggered.
 - e. The entire catapult must be behind the launch line before, during, and after all launches.
 - f. Other construction materials may be used, but no sharp objects, liquids, flames, flammable substances, or projectiles will be allowed. Violations will disqualify a catapult.
 - g. No part of the device will be allowed to leave the catapult during a launch except the marshmallow. (Violation = Tier 2)
 - h. The catapult must be designed and operated in such a way as to not damage the floor. This can be accomplished with fabric or felt pads on the bottom of the device.
10. **COMPETITION:** This event should occur in a large room with a high ceiling.
 - a. Only team members and event leaders will be allowed in the event area while teams are competing. Teams cannot receive outside assistance of any kind from anyone once they enter the competition area. Teams violating this rule will be disqualified.
 - b. Teams will have a total of 5 minutes to make one launch at each of two targets.
 - c. Targets will be placed on the floor between 1.0 m and 5.0 meters from the launch line at 0.5 m increments.
 - d. All catapults will be impounded before the target distances are announced.
 - e. Team may have 1 practice launch for each distance but must tell judge that it is a practice before launching.
 - f. Target Distances will be measured from the center of the target to where the marshmallow first lands (in cm) NOT where it rolls or finally stops. This is a straight-line distance from marshmallow to target.
 - g. If a launch fails, the target distance used will be the entire distance to the target.
10. **SCORING:**
 - a. Devices will first be ranked in tiers.
 - Tier 1= No violations for building or competition
 - Tier 2= Violations of rules 9a-h.
 - b. Target distances of both launches will be added to determine the total score.
 - Lowest total score wins. Within each tier, catapults will be ranked according to the lowest total score.
 - c. Ties will be broken by the closest single shot.
11. **EVENT RESOURCES:**

See the Event Resources tab on our website (ncscienceolympiad.ncsu.edu) for instructions, videos and more.

