

# MRS Egg Drop Competition Rules

*The egg drop competition is hosted by MRS, a student organization based in the department of materials science and engineering (MSE) at the University of Tennessee, Knoxville. The goal of this competition is to engage students in thinking about materials, their properties, and how to use them to accomplish a goal.*

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**Overview:** Teams of students must build a contraption designed to help an egg survive being dropped off the Tickle Bridge. Contraptions can be made of household or store-bought items and will be judged on weight, number of material types used, and where the contraption lands on the provided target. The egg drop competition encourages students to consider material design and aim for light, simple devices that will still protect their eggs.

1. Teams must build their contraption in advance. MRS will provide one egg per team/contraption. On the day of the competition, teams should first report to registration where their contraptions will be inspected, weighed, and photographed and they will receive a score sheet. **The drop height is approximately 50 ft.**
2. The score will be calculated according to:

$$\text{Score} = EIF * (4W + 3N + 1.5DZ)$$

|     |                                                         |
|-----|---------------------------------------------------------|
| W   | Weight in grams                                         |
| N   | Number of materials                                     |
| DZ  | Drop Zone                                               |
| EIF | egg integrity factor (1 is not cracked or 0 if cracked) |

With the lowest non-zero score winning. This means that contraptions which are lighter, use fewer materials, and fall closer to the center of the target will receive better scores.

- a. Contraptions will be weighed at registration with no egg inside.
- b. N refers to the number of materials, not the number of individual components. For example, 10 straws will be counted as one material, whereas 10 straws and 5 pieces of scotch tape would be two materials. The judge will make the final decision on number of components at registration.

- c. DZ refers to the region of the drop zone in which the egg falls.
    - i. Teams wishing to use parachutes should be mindful that high winds may occur on the day of the egg drop (and will especially affect devices with a parachute or sail). The drop team will do their best to drop all eggs under the same wind conditions, but we cannot completely control for the wind.
- 3. The Drop Zone will be comprised of three concentric rings. The rings will be two, four, and six feet in diameter. For a contraption landing in the central ring, DZ in the above equation will be 1, for the second ring 2, and for the outermost ring 3. Devices which land on a boundary line or in multiple zones will receive the score for the outermost ring the contraption is touching.
- 4. **Materials which are not allowed in construction include gases (other than air), gels, pastes, liquids, any food item, overly messy materials, and any potentially dangerous materials.** A judge will decide if any questionable devices are allowed to drop. Examples of restricted materials include peanut butter, rice, shaving cream, and helium. Please be mindful of those cleaning up after the event.
- 5. The entire device must be above the drop plane (even with the top of the railing) when released. It cannot be in contact with the ground, a person, or a structure. For example, a long slide may not be used to transport the egg from the balcony to the ground.
- 6. **Contraptions that violate the spirit of the event will be disqualified.** This includes contraptions that allow the participant control over the drop after it has left the participant's hands. For example, a "contraption" such as a ball of string that is wrapped around the egg and used to lower it onto the drop zone is not a valid contraption. Whether a contraption violates the spirit of the event is at the discretion of the judges.
- 7. Safety is a high priority, so anyone dropping their device before the drop zone is clear and their O.K. is given will be disqualified.
- 8. Any person or team may enter multiple devices as long as each design is unique.
- 9. A judge will determine if each entrant follows all contest rules.
- 10. **Score sheets must be returned to the registration desk after the drop.** Failure to return the sheet prevents scoring, and so the team cannot be ranked.

**The first, second, and third place winners will be announced on the Engineers Day website following the event.**