

2019  
**EGG DROP ENGINEERING  
 COMPETITION**  
 RULES & REGULATIONS



<b>EVENT DATE:</b>	<b>November 8, 2018</b>
<b>CHECK-IN TIME:</b>	<b>Begins at 8:30 AM</b>
<b>COMPETITION START:</b>	<b>9:00 AM</b>
<b>ENTRY FEE:</b>	<b>None. Competition entry includes admission to DHDC Exhibit Halls</b>
<b>WHO CAN COMPETE:</b>	<b>All area schools near and far are invited to participate</b>
<b>HOW TO REGISTER:</b>	Complete online registration form at <a href="http://www.dhdc.org">www.dhdc.org</a> . Click <i>Teachers</i> , then <i>Education Events</i> .
<b>AWARDS CEREMONY:</b>	Approximately 30 minutes after conclusion of competition. Ceremony is tentatively scheduled for 12:00-12:30 pm. Competition end time will depend on number of entrants.



**AWARDS CATEGORIES**

- **1<sup>ST</sup>, 2<sup>ND</sup>, 3<sup>RD</sup> Place** – overall score in each of the following age divisions: Grades 5/6, Grades 7/8, and Grades 9-12.
- **Ingenuity Award** (most innovative design) – One (1) award for Intermediate Division (Grades 5-8) and one (1) award for High School Division (Grades 9-12)
- **Lean Green Egg Machine Award** (best use of recycled materials in device design) – One (1) award for Intermediate Division (Grades 5-8) and one (1) award for High School Division (Grades 9-12)
- Each student on the winning teams will receive the corresponding medal/trophy

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### **REGISTRATION GUIDELINES**

- Advance registration is required. Pre-registration deadlines is November 2<sup>nd</sup>. A limited number of on-site registrations may be allowed if space permits.
- Students will compete in one (1) of three age divisions: Grades 5/6, Grades 7/8, and Grades 9-12. Teams with students in grade levels that cross age divisions will be assigned to compete in the division of the highest grade-level student team member.
- Minimum of 2 students and maximum of 5 students per team.
- Schools may enter up to 10 teams per campus.

### **PURPOSE**

The Egg Drop Competition is designed to provide students with the opportunity to develop their skills in engineering and design by inventing a container that will prevent an uncooked chicken egg (Grade A, Large) from breaking on impact when dropped from the predetermined height of 6.1 meters (20 feet). The competition provides are students with the opportunity to test their engineering and critical thinking skills while engaging in a real-world application of concepts learned in the classroom.

The smaller and lighter the container the higher the score, so students should plan their design accordingly.

### **COMPETITION RULES AND CONSTRUCTION GUIDELINESU**

1. Containers shall be constructed by the student(s) with minimal adult help and no kits or pre-made designs may be used. The structure must be a unique invention developed by the students. The maximum dimension in any direction is 25 cm (consider the diagonal through the device) and the maximum volume allowed is 800 cm<sup>3</sup>.
2. The goal of the competition is to create the lightest, smallest egg-cradling device capable of protecting an uncooked, grade A large egg during a 6.1 meter (20-foot fall). Egg devices will be dropped onto a concrete floor covered with a thin, industrial carpet layer and a painter's tarp. The carpeting has no carpet pad underneath.

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3. The container must have a label on the container with the following information clearly printed:
  - Team Number – assigned at team check in on competition date
  - School Name
  - Team Name
  - Age Division
  - Length, width, and height of device in cm
  - Overall volume of device in  $\text{cm}^3$
  
4. If an egg-cradling device is to be dropped a certain direction, that direction must be specified with an arrow on the device. This arrow must be easily seen and is to point in the direction that the egg is to be dropped (arrow will always be pointing to the drop site, down).
  
5. Volume will be calculated by students based on one of 4 solid shapes (sphere, cylinder, box, or pyramid). Inside air volume/space shall NOT be subtracted out. The shape dimensions and volume value shall be noted on the container label. **Inaccurate values in the volume calculations or dimensions noted will result in a 100 point deduction from a team's overall score.**
  
6. The container shall be constructed with the ability to quickly unload an untreated/uncooked grade A large egg. A maximum of 30 seconds will be allowed to place the egg in the container, a maximum of 30 seconds will be allowed to remove the egg after the drop is completed. If the egg is damaged during the placement in the container, there will be a 50 point deduction. The team member will have one additional chance to place the egg into the device in the allotted time frame (an additional 30 seconds) without breaking the egg.
  
7. Entries constructed of at least 50% recycled materials will be eligible for a 50-point bonus which will be counted toward the team's overall score. Students must be able to demonstrate this element to the judges' satisfaction by being able to describe their construction process and point out the recycled materials used in the construction of their egg cradling device. The attachment should include the team name, age division, and team number; must travel with the egg-cradling device during competition; and should be referenced on the tag attached to the device.

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8. One student from each team will enter the drop zone to retrieve the team's egg cradling device after its drop. The student shall then proceed to the scoring official in the drop zone and open the device to determine whether or not the egg was damaged during the drop.
9. A cracked egg will be defined as one which is visibly leaking its contents. Hairline fractures will not be considered cracks. This determination is at the discretion of the judge(s) at the scoring station, whose decisions are final.
10. **No pre-made plastic bubble wrap or other store bought packing materials are allowed. Styrofoam and foam type materials can be used only to create components for an egg-cradling device; they cannot be used as any part of the source of protection for the egg.**
11. No parachutes, tethers, or catch devices allowed. Live animals are also not allowed (i.e. the egg may not be dropped with the chicken as the capsule).
12. No gases other than air may be used.
13. Liquids or other materials, known as splatterables, will not be allowed as part of an egg-cradling device. Splatterables are defined as any substance that will splatter, such as certain foods or liquids. If a device is determined to contain splatterables, the device will be disqualified from competition, but may still be judged for one of the non-points awards. This determination is at the discretion of competition officials and/or judges, whose decisions are final.
14. Hazardous materials, such as flammable substances, glass or materials that can become shrapnel are not permitted in any part of the egg cradling device. Devices determined unsafe for competition will be disqualified, and will not be eligible for judging in the non-points award categories.
15. No alterations, repairs or repackaging of the egg-cradling device can be made once the loaded craft has left the judging station and/or before drop.
16. Failure to follow the design competition safety guidelines above could result in disqualification. These determinations will be at the discretion of competition officials and/or judges, whose decision are final.

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**SCORING PROCEDURES**

The score will be based on the following equation:

$$\text{Score} = \left| \frac{75B_f}{(W + L^2 + V)} \right| + R - D$$

$B_f$  = Break factor (500 for unbroken egg and 1 for broken egg)

$W$  = Weight of container with no egg (grams)

$L$  = Longest dimension in any direction (cm) (no dimension longer than 25 cm)

$V$  = Volume ( $\text{cm}^3$ ) (not to exceed  $800 \text{ cm}^3$ )

$R$  = 50-point recycled materials bonus, if applicable

$D$  = Total point deductions

***\*\*In the event of a scoring tie, designs will be fully audited for all variables and points will be adjusted accordingly***