# EGG-DROP COMPETITION
**(MIDDLE/SENIOR)**

## General Rules:

The contestants shall design and build a shipping container that will prevent an uncooked Grade A Large chicken egg (approximate mass of 57-63 grams) from cracking when dropped from an initial height of 15 meters. At the discretion of the judges, surviving eggs from the initial drop will then be taken higher and dropped a second time. Egg drop machines that do not fulfill the requirements below will be disqualified and not tested until after all the official ones have gone through both trials only if time permits:

a. **The container must be less than 800 $cm^3$ in volume**, *with no single dimension longer than 25 cm. Any irregularly shaped containers will have volumes calculated using standard geometric formulas that best resemble the container during check-in. Any disputes regarding the volume of a container must be resolved during check in, not at the Olympiad.*
b. The maximum weight, including the egg, cannot exceed 1,000 grams.
c. Contestants must be able to remove the egg without damage.
d. A maximum of 30 seconds will be allowed to open the container, place the egg in the container and re-seal it.
e. After the drop, 30 seconds to unseal, competitors must remove and show the undamaged egg then replace it and re-seal the container.

## Materials:
Any material may be used in the design, as long as the structure meets the design requirements and contest rules.

## Requirements:
1. No kits or pre-made designs may be used. The structure must be the team's invention.
2. The structure must be completely released (no strings or other attachments). **No parachutes.**
3. The structure must land in a designated target area.
4. No propulsion systems will be allowed.
5. No gases (e.g., helium) other than air can be present in the structure when it is weighed.
6. Inside air space will not be subtracted out. Volume will be calculated based on the shape of the containers as measurable by standard measuring devices, i.e., ruler or tape measure.

## Judging:
1. Grade A large eggs will be supplied at the contest. You cannot bring your own egg.
2. All containers will be inspected by judges before being dropped.
3. Once an egg is weighed-in with the structure, that egg cannot be exchanged with another.

4. The egg must be placed into the container on-site. A maximum of 30 seconds will be allowed to place the egg into the container and remove it. Exceeding this time limit will lead to disqualification from the contest.
5. If the egg is damaged during placement in the container, the team will be disqualified.
6. The egg must be undamaged after the drop in order for the value to be recorded. In the event that all eggs do not survive the second drop, the values from the previous drop ill be recorded.
7. The score will be based on the equation:

$$S2 = \frac{75S}{(W + L^2 + V)}$$

Where *S* is the success factor with values:

*S* = 100 if egg does not break
*S* = 10 if egg breaks on 2nd drop
*S* = 1 if egg breaks on 1st drop

*W* = Weight (grams)
*L* = Longest dimension
*V* = Volume ($cm^3$)

*S*2 = Total points value

8. The eggs will be dropped from an initial height of 15 meters; the second and final drop will be from a height greater than 15 meters.

9. The winner will be determined by the team with the highest score (S2).

***NOTE: Containers must meet volume requirements to qualify for competition.***

## EGG DROP COMPETITION
## (Evaluation Worksheet)

Please Check ☐ Middle School ☐ High School

| |
|---|
| **School Name:**_____ |
| **Team Name:** _____ |
| **Students' Names:** |
| _____ |
| _____ |
| _____ |
| **Judge's Name: _____ Date: _____** |

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| |
|---|
| **This section to be completed only by the judges.** |
| L= _____ Longest Dimension (centimeters) |
| V= _____ Volume ($cm^3$) |
| W= _____ Weight (grams) |
| S= _____ 100 points if the egg does not break; 1 point if egg does break |

$$S2 = \frac{75S}{(W + L^2 + V)}$$

S2= _____ S2 (winner)= _____

**FINAL Overall Score:**

$$\frac{S2}{S2\ (winner)} \times 100 = \_\_\_\_\_ \text{ points}$$

**DROP #1 Survived: _____Yes _____No**

**DROP #2 Survived: _____Yes _____No**