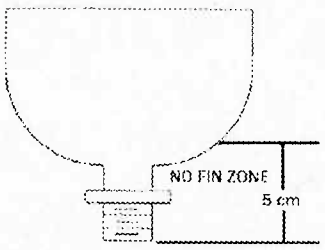
EGG-O-NAUT

1. **DESCRIPTION:** Prior to the tournament, teams will construct rockets designed to stay aloft the greatest amount of time while carrying an Egg-O-Naut (a raw Grade A large chicken egg) that survives (doesn't break) impact.

   TEAM OF UP TO: 2 **IMPOUND:** No **EYE PROTECTION:** #5 **APPROX. TIME:** 10 minutes

2. **EVENT PARAMETERS:**
   a. Teams will build and bring up to two rockets to the tournament.
   b. **Participants must wear eye protection rated ANSI Z87+ (Eye Protection #5 on www.soinc.org) during** the loading, launching, and retrieving of their rockets and Egg-O-Nauts.
   c. **Event supervisors will provide the launcher, water, and Grade A large chicken eggs.** The supervisor will place an identifying mark (using a Sharpie or ink stamp) on the eggs to ensure that teams are using provided eggs.

3. **CONSTRUCTION PARAMETERS:**
   a. Each rocket's pressure vessel must be made out of a single **2-liter plastic** carbonated beverage bottle with a neck/nozzle opening approximately 2.2 cm internal diameter (1/2 inch Schedule 40 PVC pipe should just fit inside the nozzle opening). Labels may be removed from the bottle but labels must be presented at the safety inspection.
   b. The structural integrity of the pressure vessel (carbonated beverage bottle) cannot be altered. Examples of altering structural integrity include but are not limited to physical, thermal or chemical damage (e.g. cutting, sanding, using hot glues, or super glues). **Tape and select glues may be used to attach fins and other components to the pressure vessel.** Glues must be silicone or polyurethane-based. Damage to the structural integrity of the pressure vessel will result in disqualification and the rocket will not be allowed to launch. Damage will be assessed by looking into the bottle through the nozzle for discoloration, bubbles, or thinning of the walls of the bottle.
   c. Metal may be used, but may not be attached to or have direct contact with the pressure vessel and any time. For safety, rockets **and separated components** may not use leading surfaces that are sharp, pointed, or consisting of a rigid spike.
   d. Commercial model rocket parts may not be used.
   e. All rockets will be launched using the launcher provided by the supervisor. To ensure rockets will fit on the launcher, fins and other parts added to the bottle must be **5 cm or higher above the level of the bottle's opening. Nothing, including tethers, may break this plane.**



   f. All energy imparted to the rocket **at launch** must originate from the water/air pressure combination (both provided by the event supervisor). No explosives, electric, elastic powered flight, throwing, remote controls, or pyrotechnics may be used.
   g. Any recovery system is allowed. **Potential or kinetic sources of energy may be used in the recovery system; however, objects (such as springs, rubber bands, etc.) must be in their lowest energy state at launch.**
   h. The rocket(s) must be built so that the egg **provided by the event supervisor** is easily removed. Nothing (e.g., glue or tape) may be adhered to the egg.
   i. The part of the rocket containing the Egg-O-Naut should be **differently** colored if it is to detach from the rocket.

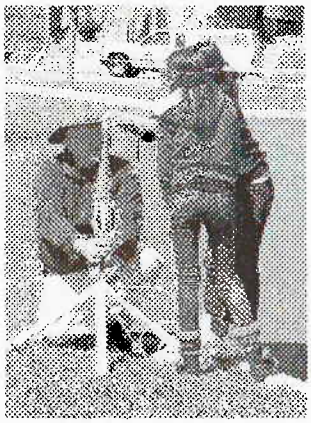
4. **THE COMPETITION:**

a. Egg-O-Naut is a walk-up event; teams should arrive at the competition site ready to launch. Following the safety inspection of each rocket, teams will receive 1 egg per rocket, add any amount of water and load their egg in each rocket. When called to launch, the teams will have a total of **10 minutes** to launch 1 or 2 rockets brought to the competition (only 1 launch per rocket). Any rocket launched before the time expires will be scored. The second rocket may be launched prior to retrieval of the Egg-O-Naut.

b. All rockets will be launched at **75 psi**. Once the rocket is pressurized, no contestant may touch or approach the rocket.

c. Time aloft will be recorded **in** hundredths of a second. Timing begins when the rocket separates from the launcher and stops when the Egg-O-Naut or portion of the rocket containing the egg touches the ground or comes to rest on a tree, building, or other obstruction or goes out of sight. Preferably three timers should be used and the middle recorded time will be used for scoring.

d. The teams will retrieve their rockets and immediately show the rocket or capsule with the Egg-O-Naut to an event inspector. Any Egg-O-Naut capsule or wrapping must be opened in the presence of an event official.



5. **SCORING:**

a. Any Egg-O-Naut (or portion of the rocket containing the egg) that completely detaches from the pressure vessel will receive a 3 second bonus. Rockets whose parts (e.g. fins) do not remain linked while aloft will not be disqualified or penalized.

b. Egg-O-Nauts that can be retrieved and survive will receive a 15 second bonus. Egg-O-Naut's survival is defined as not cracking the egg enough to leave a wet spot on a paper towel. An Egg-O-Naut that cannot be retrieved will not receive the 15 second bonus.

c. The score for each rocket will be equal to its time aloft plus bonus seconds for Egg-O-Naut capsule separation plus bonus seconds for Egg-O-Naut survival. A team's final score for the event will be the score for their individual rocket with the highest score.

d. Teams whose final score is for a rocket with construction violations will be scored as follows:

i. Rockets that violate a safety related construction rule will not be launched and will receive only participation points (this includes competitors not wearing proper eye protection).

ii. Teams having other construction violations will be ranked **in a tier** below other teams.

e. **Ties will be broken by** the better score of **each tied team's** other rocket.

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