
Bottle Rocket

A team of up to 3

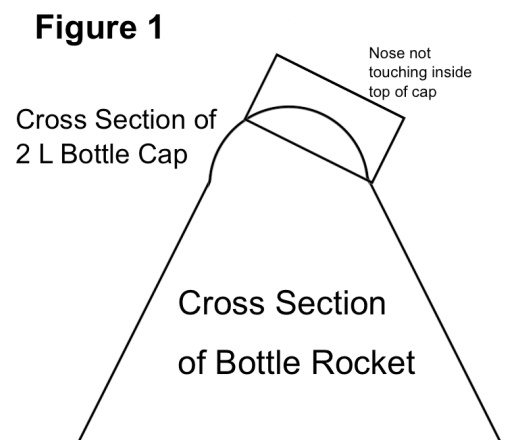
1. **DESCRIPTION:** Prior to the tournament, teams construct a water bottle rocket designed to stay aloft for the greatest amount of time.

2. EVENT PARAMETERS:

- A. Teams must design, build and bring a bottle rocket to the tournament.
- B. Teams without proper eye protection must be immediately informed and given a chance to obtain eye protection if time allows, otherwise they will not be allowed to compete and scored as a no-show.
- C. Event supervisors will provide the launcher and water.

3. CONSTRUCTION:

- A. Rocket pressure vessels must be made out of a single **2 liter or less** plastic carbonated beverage bottle with a neck/nozzle opening internal diameter of approximately 2.2 cm (a 1/2 inch Schedule 40 PVC pipe must fit tightly inside the nozzle opening). Labels may be removed from the bottle but must be presented at safety inspection.
- B. **Only tape must be used to attach fins and other components to the pressure vessel. No glues of any type may be used on the pressure vessel. Glue may be used in other parts of the rocket assembly.** Metal of **any type** and commercial model rocket parts are prohibited anywhere on the rocket.
- C. The structural integrity of the pressure vessel **must** not be altered. This includes, but is not limited to: physical, thermal or chemical damage (e.g., cutting, Sanding, using hot or Super glues, **spray painting**).
- D. Alteration to the structural integrity of the pressure vessel results in a **safety** violation of the rocket and it must not be launched. Event supervisors assess structural integrity by looking through the nozzle and sides of the bottle for discoloration, bubbles, thinning or cuts in the walls.
- E. The nose of the rocket must be rounded or blunt at the tip and designed such that when a standard 2 liter bottle cap (~3.1 cm diameter x 1.25 cm tall) is placed on top of

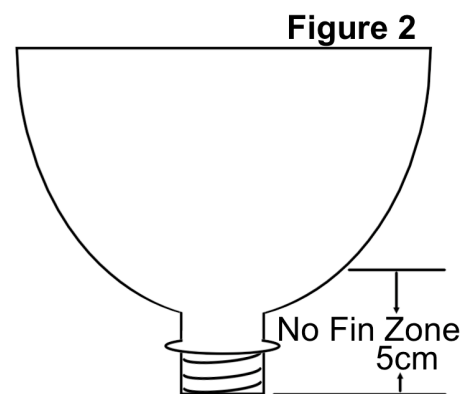


the nose, no portion of the nose touches the inside top of the bottle cap (see Figure 1). Teams must not use a nose that is sharp, pointed, or consisting of a rigid spike regardless of the material used.

F. Explosives, gases other than air, chemical reactions, pyrotechnics, electric or electronic devices, elastic powered flight assists, throwing devices, remote controls, and tethers are prohibited at any time. All energy imparted to the rocket at launch must originate from the water/air pressure combination.

G. All rockets must be launched using the launcher provided by the supervisor. Fins and other parts added to the bottle must be 5 cm or higher above the level of the bottle's opening, to ensure rockets fit on the launcher (see Figure 2).

H. Rockets must not change shape or deploy any type of recovery system.



4. THE COMPETITION:

A. Teams must arrive at the competition site ready to launch. Following the safety inspection of the rockets, teams may add any amount of water to the inspected rocket. When called to launch, the teams have a total of 6 minutes to launch the rockets (only 1 launch per rocket). Any rocket launched before the time expires must be scored.

B. Rockets must be launched at 60 psi. Once pressurized, teams must not touch or approach the rocket.

C. Parts of the rocket must not fall off or become separated during launch or flight.

D. Time aloft is recorded in hundredths of a second. Timing begins when the rocket separates from the launcher and stops when any part of the rocket touches the ground, goes out of sight, or comes to rest on an obstruction (e.g. a tree or building).

5. SCORING:

A. Rockets with construction or safety violations will not be launched due to safety. Teams that are unable to launch a rocket because of construction violations will receive participation points only.

B. Ties are broken by launching the rockets of tiers again.

Recommended Resources: All reference and training resources including the Bottle Rocket DVD are available on the Official Science Olympiad Store or Website at www.soinc.org