

## HELICOPTER EGG DROP

1. **DESCRIPTION:** A team will construct a device that uses a helicopter rotor to safely transport a raw chicken egg from a specified height to the floor.

**A TEAM OF:** 2    **IMPOUND:** Yes    **APPROXIMATE TIME:** 10 Minutes

### 2. **EVENT PARAMETERS/CONSTRUCTION:**

- a. A team will construct a rotary-wing (helicopter) device to transport a raw chicken egg from a specified height to the floor and not break the egg.
- b. The device will use wings or blades that rotate around a central axis to slow the descent of the egg, using aerodynamic principles of a helicopter rotor in unpowered "autorotation" mode. No energy-producing mechanism of any type can be used to power the rotor(s) to slow the descent of the device. No pre-made rotor assemblies may be used. The device must not be an airplane, a balloon, or a parachute.
- c. The bare egg will be sealed in a plastic sandwich bag (tape to seal the bag will be provided by the event supervisor) placed in a cup (8-10 oz). The cup will be mounted or suspended from the bottom of the helicopter device in such position that the cup is the first thing to contact the floor. No other shock absorbing or cushioning materials may be used either inside or outside the cup to protect the egg when the cup contacts the floor.
- d. The entire device, less egg, sandwich bag and cup, fully assembled in flying configuration, must fit inside a 50 cm x 50 cm x 50 cm cube.
- e. Helicopters not meeting these parameters will be ranked below those that do.

### 3. **THE COMPETITION:**

- a. The entire helicopter must be impounded before the start of the event. No modifications are allowed after impoundment other than to attach or remove the egg from the helicopter. The device will be released from impound when the team has finished competing.
- b. The event supervisor will provide each team with one raw grade A large chicken egg, one plastic sandwich bag, and a cup (8 – 10 oz). If the egg is broken by the competitors before the drop, they may request another egg, with a penalty of 5seconds removed from their final time.
- c. There will be only one drop for each helicopter. The helicopter will be dropped from a height designated by the supervisor. The height of the drop will be announced on the day of the tournament. The drop height should be a minimum of 5 meters.
- d. Each helicopter will be timed to the hundredth of a second from the time the student releases the helicopter device until the time the egg touches the floor. It is suggested that three timers are used, and the final time be the average of the three times.
- e. After the drop the student will remove the sandwich bag from the cup, with the egg contained within it, and hand it to the event supervisor for inspection. Those helicopters whose egg did not survive intact will be ranked below those that do.
- f. A broken egg is defined as having a crack that leaves a wet spot on a paper towel.

### **SCORING:**

- a. Teams will be ranked by the amount of time it takes from the time the device is dropped to the time the cup contacts the floor. Highest time wins
- b. The tie-breaker is the mass of the lightest helicopter (without the sandwich bag, cup, and egg).
- c. The helicopters whose egg did not survive will be ranked below those that do.
- d. NO appeals can be filed or processed after a device leaves the impound area.