

# JUNK BOX WARS

## Drop Zone

Create a parachute that will help an egg land safely on a target!

### Competition Rules:

Your team will be provided with a junk box filled with materials that could be used to create a parachute. Each team will receive only set of materials. Teams may use all or part of the materials in the junk box and are not allowed to share materials with other teams. All unused materials should be saved in case repairs are needed during competition.

Teams will be allowed time to build and test their parachute. Practice eggs will be provided for testing purposes. Competitors are allowed to bring diagrams to help them build their parachute. After the time is up, all parachutes will be impounded and no changes will be allowed.

### Junk Box Possible Supplies

Straws  
Wooden craft sticks  
Pipe cleaners  
Index cards  
Pieces of Paper  
Grocery bags  
Tissue paper  
Newspaper  
Glue  
Masking tape  
String or yarn  
Fishing line

### Device Requirements:

Your parachute may not be aided by a helping hand or other energy source. Teams will be provided with an egg seat (a plastic cup or piece of an egg carton) and seat belts (2 rubber bands). You will need to attach the parachute device to the egg seat. Other modifications to the egg seat are not allowed, such as extra padding, materials that cover the egg and seat, or the addition of extra materials for the purpose of protecting the egg.

### Testing Procedure:

Each team will be allowed 5 minutes to load the egg into the egg seat and prepare the parachute. Each team will choose an egg for each trial and load the egg into its seat before proceeding to the drop zone. Each team will be allowed two trials with 5 minutes allowed between trials for repairs and adjustments using materials left over from construction.

One team member will drop the parachute from a height and location determined by the teacher. The entire device (egg and parachute) must begin above the drop line. A plumb line will be available to help you line up your device, but must be removed before the actual drop.



The goal of the contest is to have the egg land and remain on the center of the target without the egg breaking. If the egg does not leave a wet mark on a paper towel, it is considered unbroken!

The score will be determined by measuring the distance between the furthest edge (or part) of the device and the center of the target. The best result (smallest distance) out of the two trials will be considered for final results. The lightest parachute (without the egg) will win in the case of a tie.

## Sample Score Sheet



### Drop Zone

Team Name: \_\_\_\_\_

Team Members : \_\_\_\_\_

Mass of parachute = \_\_\_\_\_ g

**Trial 1:**

Distance = \_\_\_\_\_

**Trial 2:**

Distance = \_\_\_\_\_



**Drop Zone**

Team Name: \_\_\_\_\_

Team Members :

Mass of parachute = \_\_\_\_\_ g

**Trial 1:**

Distance = \_\_\_\_\_

**Trial 2:**

Distance = \_\_\_\_\_



**Drop Zone**

Team Name: \_\_\_\_\_

Team Members :

Mass of parachute = \_\_\_\_\_ g

**Trial 1:**

Distance = \_\_\_\_\_

**Trial 2:**

Distance = \_\_\_\_\_



**Drop Zone**

Team Name: \_\_\_\_\_

Team Members :

Mass of parachute = \_\_\_\_\_ g

**Trial 1:**

Distance = \_\_\_\_\_

**Trial 2:**

Distance = \_\_\_\_\_



**Drop Zone**

Team Name: \_\_\_\_\_

Team Members :

Mass of parachute = \_\_\_\_\_ g

**Trial 1:**

Distance = \_\_\_\_\_

**Trial 2:**

Distance = \_\_\_\_\_



## Drop Zone Teacher Notes

### Recommended Supply List

2 ' Dowel rod (may be cut )	Hot glue gun with 5 sticks of glue (or regular glue)
4 Pencils	200 cm of Masking tape
20 Straws	200 cm of String or yarn
20 wooden craft sticks	200 cm of Fishing line
20 Pipe cleaners	
5 Index cards	Also needed for competition:
5 Pieces of Paper	• Plumb Line
2 Plastic grocery bags	• Grade A Large eggs
2 Paper grocery bags	• Plastic cups or pieces of a cardboard egg carton
2 Sheets of tissue paper	• Drop Zone and target area
2 Sheets of newspaper	

### Notes:

(1) Students may use all or part of the materials in the junk box. I allow the students to use any material inside the box, but not the box itself. For example, if any of the materials come in wrappers or boxes, teams may use those for the device. The materials may be modified with the understanding that if a goof is made they will not receive new materials. Leftover materials may be used to make repairs if the device breaks during competition. No major design changes are allowed!

(2) Students may build a variety of parachutes as long as it meets the requirements outlined in the rules. Devices that fail to meet the requirements will be disqualified. The only materials that can surround the egg are the egg seat (a plastic cup or piece of egg carton), the seat belts (two rubber bands), and the material used to attach the seat to the parachute itself. Students are not allowed to make modifications to the egg seat and should focus their efforts on making a good parachute.

(3) You will need to establish a drop zone and create a target area, such as a bullseye on a piece of poster board. You may want to laminate the poster board in case of broken eggs! Be sure to pick an area that will be safe for the students, but provide a good height for the parachutes. You will also want to provide safety glasses for students near the drop zone.

(4) Before testing, measure the mass of each parachute (without the egg) and record on the event score sheets. To test the devices, one team member will need to pick out one Grade A Large egg, secure it in the egg seat with the rubber bands, and proceed to the drop zone. The student may use the plumb line, but it must be removed before the actual drop. After you are sure all the parts of the device are above the drop line, give the student a signal that it is ok to drop. If the egg does not leave a wet mark on a paper towel after the drop, it is considered unbroken! Measure the distance between the center of the target and the furthest edge of the device to determine the team's score. The team with the shortest distance is the winner.