

# ■ FLIGHT

## STUDENT QUICK-START

### SCENARIO

A flood has cut off a regional town and they cannot get food or medical supplies. Your team must design an autonomous glider to deliver the supplies to a specific landing zone with a controlled and accurate flight.

### AIM

Design and build a balsa glider to travel a substantial distance, land on a specific landing zone and hit a target.

The glider will be scored based on distance travelled, precision of landing, and accuracy hitting a target. One glider will be made for all tests, but this glider can have slight modifications (i.e. flaps, ailerons, weight distribution) between launches.

### WHAT TO DO

Your team needs to use the template provided to design and build a glider using a fixed quantity of balsa wood. The glider will be launched using the YEET (YOLO Electronic Ejection Technique) which will be demonstrated by the Activity Personnel.

Begin by planning your glider dimensions, taking note of the recommended size to allow effective launching with the YEET. Cut out the fuselage (including tail) from the thick sheet of balsa wood using the template provided. Be careful when cutting to avoid wasting materials or breaking your glider. Cut out the wings from the thinner sheet of balsa wood. The thin balsa can also be used for additional parts such as horizontal stabilizers. Cut a thin slot in the top of your glider for the wings to slide through.

#### **⚠ USE THE TEMPLATE!**

If you do not follow the guides for wing and tail placement on the template, your glider simply won't launch from the YEET

**⚠ ALL CUTTING TO BE COMPLETED ON THE CUTTING MATS PROVIDED. TAKE CARE.**

The position of the wings can be adjusted by sliding the wings forward or backward. The weight of the glider can be adjusted by adding the small bulldog clip and BluTak to the nose of the glider. Experiment with these adjustments to see how the flight of the glider is affected. It is highly recommended to build a basic glider quickly, then launch as many times as possible to adjust the glider and improve the flight. During pre-testing, you may want to add extra features such as flaps, ailerons, and elevators, but these may not be necessary.

### TIMETABLE

Half-Day Activity	
<b>Session</b> (1h 45m)	5 minutes – Briefing by your Activity Personnel 30 minutes – Build your glider 30 minutes – Pre-test and adjust your glider 35 minutes – Scoring 5 minutes – Pack up

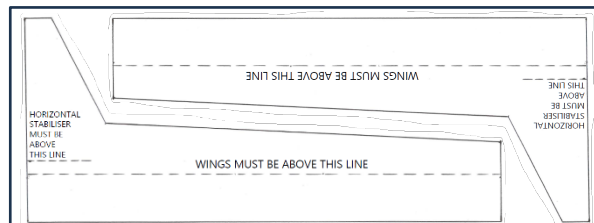
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## RULES

Your glider must have a wingspan of at least 15cm. Your design must resemble an aeroplane including fuselage, wings, and tail. You are not permitted to build a javelin/dart like structure, and the Activity Personnel will judge the suitability of your design.

There is a limit of one thick and one thin balsa sheet per team. One bulldog clip, 2 metres of masking tape and a ¼ strip of BluTak are allowed per group. The balsa provided is enough to produce two gliders. If you are careful, you should be able to cut two fuselages from the thick sheet of balsa. This will allow for breakages and changes to design. It is up to the coordinator to decide as to whether you can have more balsa due to breakage or design changes.



One glider is to be made for all tests, but this glider can have slight modifications (i.e. flaps, ailerons, weight distribution) between launches. During building and pre-test time, the glider can be launched as many times as possible in the allocated time. Your coordinator will advise you of time limits. Don't use a launcher without one of the event staff being present.

## SCORING

Three attempts will be given for each test but only the highest score for each test will be used to calculate the grand total.

### Test 1 – Distance

The distance from the launcher to closest part of your glider will be measured once your glider has come to rest on the ground. The score will be calculated using the lookup table. Only the highest score will be used for final score calculations.

### Test 2 – Precision landing

Two hundred points will be awarded if any part of the glider lands on the precision landing target, otherwise two points for every centimetre away from the target will be deducted. i.e. If the nearest part of your glider is 5cm away from the target edge you would receive  $200 - 10 = 190$  points.

NB: The distance is measured from the edge of the target to the part of the glider closest to the landing area.

### Test 3 – Aim and flight control

Three attempts are given to hit the target bullseye. Points are awarded based on the accuracy of the glider flight.

**⚠ 200 bonus points are awarded for returning the craft knife and bulldog clip during pack up**

**At the end, ensure your team's score sheet is with the Activity Personnel.**