

Flying Start Challenge

STUDENT GUIDE TO THE 2017/2018 CHALLENGE

THE CHALLENGE

Your team objective is to manufacture a glider that can fly as far and as straight as possible whilst carrying a payload.

Lessons will be given to your class by your Flying Start Challenge Representative covering the basics of flight, theory of lift and drag and other details that will help you when designing and manufacturing your glider.

Your team will be scored on the quality and successful completion of a glider flight, glider manufacture, a poster presentation, a quiz (regional final only) and two engineering activities (grand final only).

A breakdown of how many points are awarded for each task is given below.

Task	Points Awarded	
	Regional Final	Grand Final
Glider Flight	200	200
Poster Presentation	150	150
Materials, Innovation & Sustainability	150	150
Quiz	100	-
Engineering Activity 1	-	50
Engineering Activity 2	-	50
TOTAL	600	600

The challenge rules will be provided and any breaking of these rules by teams will result in points being deducted or team disqualification. If you or your team are unsure of anything please ask your Flying Start Challenge Representative.

Dates for Your Diary!

- Bristol Regional Final – TBC
- Yeovil Regional Final – TBC
- Gloucestershire Final -TBC
- Grand Final, Fleet Air Arm Museum (FAAM) –**March 2018**

Handy Tip!

Make sure to complete your log book after each lesson and to record all the steps that you and your team have taken in designing and manufacturing your glider. This makes life a lot easier when it comes to completing your poster!

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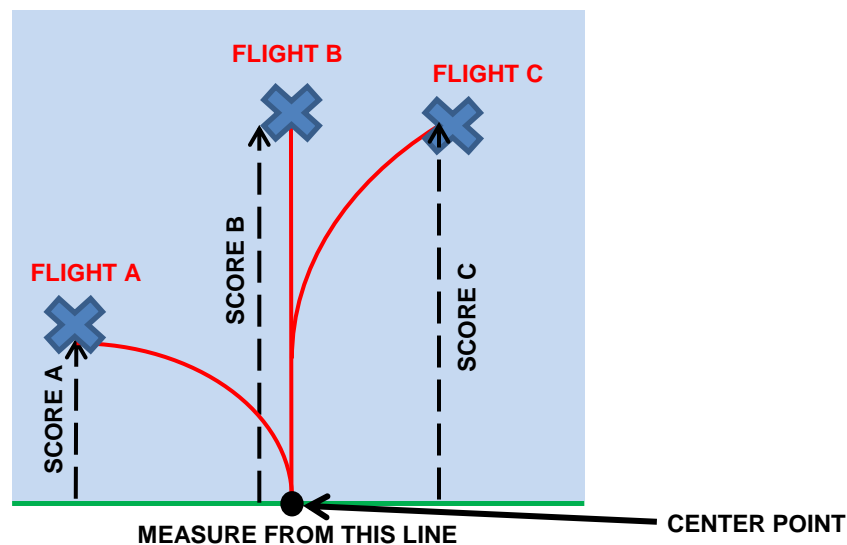
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YOUR GLIDER FLIGHT

Your team must make sure your glider is balanced to allow you to throw it as far and as straight as possible whilst carrying a payload (provided by your FSC representative). There are **200 points** available for your glider flight.

Marks are awarded for your team's glider flight and are based upon how far away from the green line that the glider lands. This is measured perpendicular to the green line (dashed black lines shown). This takes into account the distance travelled by your glider as well as the accuracy and is used to calculate a score for your team's glider flight.

EXAMPLE



Flight A wasn't very accurate and didn't travel that far. The perpendicular distance is the shortest therefore this gets the lowest score.

Flight B has the longest and straightest flight path.

Flight C has travelled the same perpendicular distance as Flight B. However, Flight C's flight path is not straight, so while it has travelled further than flight B it will be get the same score as B as it has the same perpendicular distance.

The straighter the flight the more chance you have of scoring the highest points.

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MANUFACTURE

Judges at the Regional and Grand Finals will be looking to see the manufacturing process your team has utilised to create your glider. They will also be looking for teams with gliders that exhibit creative, “thinking outside the box” ideas, as well as teams who have taken into account environmental considerations. A total of **150 points** is available for this task based on innovation, sustainability and the manufacture process.

At the Grand Finals, your poster must show any alterations that your team may have made to your glider and during your presentation you will be required to explain why these changes have been made (this includes anything from simple repairs to the redesign of parts of your glider).

YOUR POSTER & PRESENTATION

During the regional and grand finals, teams will deliver a poster presentation to a panel of judges. Your poster should reflect:

1. A demonstration of the knowledge of flight dynamics you have gained from lessons
2. Details of the design and testing phases of your glider
3. The manufacturing process used by your team when manufacturing your glider
4. Consideration of sustainability and environmental impact
5. Evidence of your team work and planning
6. **Any changes in your design since the regional finals.** (Grand final only)

It is important to keep your log books up-to-date to help with your poster.

A total of **150 points** is available for this task (75 for your poster and 75 for your presentation). Points will be awarded on what information you include about each topic as well as the quality of this information.

QUIZ

At the regional finals, all team members will complete a quiz and the team’s score will be an average of the team’s scores. This will test your knowledge of what you have learnt during your lessons.

A total of **100 points** is available for successful completion of the quiz.

ENGINEERING ACTIVITIES

At the Grand Final, each team will also take part in two engineering activities. The full details of the engineering activities will be provided on the day of the Grand Final. The total points available for these activities are **100 points**.

YOUR MATERIALS BUDGET

Your team has a fictional budget of £100 and teams can only use materials listed in the Bill of Materials (BoM). Only the cost of

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materials used on the final glider should be recorded and presented on your team's poster, this is not directly marked but should be given on your poster as evidence that your glider is within budget. This is good practice and is a real life task all engineers have to complete at least once.

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Bill of Materials (BOM)

This will help you to calculate the cost of your glider (Prices in Flying Start Dollars £). If you are unsure please ask for help.

General Materials	
Hardwood strip	£35 per piece (provided)
Balsa wood	£35 per piece (provided)
Other types of wood	£35 (unlimited quantity)
Plastics	£18 per A4 size board
Foam board	£15 per A4 size board
Polystyrene	£12 per A4 size board
Papier-mâché	£10 (unlimited quantity)
Cling film	£5 per 10 cm of roll
Tin foil	£5 per 10 cm of roll
Fabrics/Textiles	£5 per A4 size piece
Paper	£3 per A4 size sheet
Leaves	FREE
Toilet Roll tubes	FREE
Plastic bottles	FREE
Newspapers	FREE
Cardboard boxes	FREE
Joining Methods	
Sellotape/Duct tape	£15 (unlimited quantity)
Adhesives	£15 (unlimited quantity)
Blu-Tac	£10 (unlimited quantity)
String/Thread	£10 (unlimited quantity)
Non-Metal fasteners	£9 (unlimited quantity)
Elastics	£9 (unlimited quantity)
Decorating Materials	
Paint	FREE

All quantities are the minimum purchasable i.e. if you use 1 and a half sheets of A4 paper you still have to pay for 2 sheets. Any materials not covered above are priced at the discretion of the Flying Start Committee

The Bill of Materials and your materials budget are to be presented at the Regional and Grand Finals on your poster. Your log book does not need to be handed in but should help you with your poster.

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