

## Flying Start Challenge 2009 Marking Scheme – Students Guide

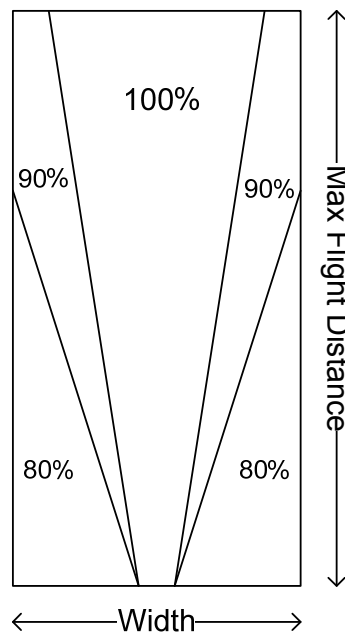
There are two categories in which you will be able to score points, Flight and Team Knowledge. If you read the two sections below they will tell you how to score as many points as possible to give you the best chance of winning the Flying Start Challenge

### The Fly-Off

The total mark available for the flight is 40 points.

In order to score the maximum number of points you will need to design a glider that will fly as far as possible in a straight line. To do this your glider will need to create lots of lift and be well balanced.

If your glider flies to the left or right then you will lose points. The percentage of your points that you will lose for a curved flight path is determined by where your glider lands. There will be three different landing zones marked out on the floor as shown below.



These landing zones will give you 100%, 90% or 80% of your total score. If your glider flies the whole length of the flight zone and lands in the 100% zone you will score 40 points. If your glider flies the full length but lands in the 90% zone you will score 36 points.

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If the glider flies out of the flying area then the distance flown and landing zone are taken at the point that your glider leaves the landing zone.

Each team will have three flights during the fly-off. Your team score for the Fly-Off will be the **Average of the best two flights**.

## Budget

You have a budget of **£3** to build your glider. The Flying Start Challenge has supplied you with a pack of Balsa wood that you can use along with other materials that your school or you will provide to build your glider. It will be up to you to decide what materials you use and figure out the cost of your finished Glider.

The cost of the Balsa supplied is given in the table below.

Item	Dimensions	Cost (each)
Large Balsa Sheet	1/4" x 3" x 36"	£0.90
Small Balsa Sheet	1/8" x 3" x 36"	£0.61
Balsa Sheet	1/8" x 1/8" x 36"	£0.14
Hardwood Strip	1/4" x 1/4" x 36"	£0.42

For reference 1" ≈ 2.54cm

**Remember, you can use recycled materials for free.** This is an excellent way of saving money if you are getting close to the budget limit and it will score you extra points for environmentally friendly design. You could also score extra points if you find out how materials could be recycled once you have finished with your glider.

You do not have to include the cost of materials used during the build and test of your gliders, just the costs of the materials on your final glider that you will use for the competition. You also do not have to include the cost for glue however you should declare any of these "free" materials in your budget

## Example of Budget report

1 and a Half Small Balsa Sheets = £0.92, supplied by FSC

1 Hardwood Strip = £0.42, Supplied by FSC

210mm x 295mm x 0.25mm of acrylic plastic sheet = £0.85 sourced from <http://www.always hobbies.com/Store/Craft-Materials/Plastruct/Acrylic-Clear-Plastic-Sheet>

Polystyrene recycled from packaging = £0.00

Old Newspaper = £0.00

PVA Glue = £0.00

Total cost = £2.19

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## Team Knowledge

During the Regional and Grand Finals you will be given activities to show how much team knowledge you have acquired during the Flying Start Challenge. The total number of points available for team knowledge is 60 points. The 60 points will be split up into a Quiz, Poster Presentation and Engineering Exercise (Grand Final only)

In the Regional and Grand Finals your team will be able to score up to 20 points for completing a quiz. The quiz will test your knowledge of glider flight and aviation history.

During the Regional Finals your team will deliver a poster presentation to a panel of judges. Obviously in order to do this you must first create a poster giving information on the glider you design and build. Your poster should include design drawings, information on the forces acting on your glider, how you have tested it and how you have improved it. There will be 40 points available for the poster presentation. The categories that the judges will be marking you against and the number of points available for each category are in the table below.

Category	Guidance	Points
Knowledge of Flight Dynamics	Question team on principles of flight including how a wing creates lift, the forces acting on an aircraft, control surfaces/flight control, why their glider looks as it does (matching questioned theory to glider design), extra points for innovative Design.	15
Build Quality	How well is the glider built? Has the team thought about reuse-ability?	5
Materials used and budget	Are the materials used appropriate? Why did they use the materials on their glider and are they appropriately costly? Does the glider balance design and budget?	5
Eco design	Has the team considered the sustainability of the materials used and have they made appropriate use of recycled materials?	10

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Teamwork and planning	Has the team worked well together during the design and build of the glider? Did they divide the work up well and maximise the team's efficiency?	<b>5</b>
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In the Grand Final you will not be doing a poster presentation but your poster and glider will be looked at by a panel of judges and up to 20 points will be awarded. The scoring scheme is exactly the same as the table above but the points will be halved.

At the Grand Final you will also take part in two Engineering activities and there will be 10 points available for each. The full details of the engineering activities will be given on the day of the Grand Final.

So, let's review where the points are awarded:

## Regionals

Fly-off	40 Points
Quiz	20 Points
Poster Presentation	40 Points

## Grand Finals

Fly-off	40 Points
Quiz	20 Points
Poster inspection	20 Points
Engineering Activity 1	10 Points
Engineering Activity 2	10 Points

Here are some final tips to help you score as many points as possible.

- 1) Plan and Design your glider BEFORE trying to build it.
- 2) Keep a record of your initial plan and design.
- 3) Think carefully about the best materials available.
- 4) Use recycled materials where possible.
- 5) When testing your glider, only make one change at a time, otherwise you won't know which change made it better or worse.
- 6) Record any changes you make to your initial design including WHY you made each change.
- 7) Have fun; when you enjoy doing something you're more likely to come up with good ideas.

## Questions

If you have any questions about this marking scheme then please ask your schools support Sponsor Company. In addition there is a lot of information that can be found at [www.flyingstartchallenge.co.uk](http://www.flyingstartchallenge.co.uk)

On behalf of the Flying Start Challenge committee, good luck in the design and build of your school's gliders. We look forward to seeing them at the finals.

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