

Aerodynamic Design

Task:

To evaluate your Formula Schools entry for Aerodynamic efficiency.

Introduction

With scale speeds in excess of 200mph these cars can be made to handle better with the use of basic aerodynamic principles. By using Computational Fluid Dynamics (CFD) you can evaluate your body or chassis design to enhance performance without the use of a wind tunnel.

Research Section

What are the basic principles of drag and lift?

Where can they be applied on a racing car? Why is an aerodynamic design preferable?

How can the whole car design be tested? Can just the body be tested?

Design Section

Working in conjunction with the body-shell design team and the chassis team; using all your research material compile the information needed to shape your chassis and body-shell to fit your aerodynamic profiles.

Testing Section

Designing using CFD

Model your chosen body-shell design on a suitable CAD package and input that shape into the CFD package. Test your design using the CFD package and obtain the results or drag and lift for one design.

Modify your design with wings, ground effect and side skirts and re-test.

Designing using a comparative wind tunnel

Once the body has been produced test the design in the wind tunnel against other scale designs. Show which produced the least drag either by photos of the drag as the tunnel is running or by plotting a graphic showing the drag force.

Target Areas

KS 3 or 4

Product Design
Vacuum forming

GCSE Engineering

Unit 1

Specifications and Engineering drawings

Unit 2

Production planning, Choosing materials, Using processes
Health and Safety

Unit 3

Investigating Products

Key Skills

Communication, Number, IT

