Ravens Wood School

KS3 Curriculum Plan

Subject: Design Technology

Formula One Project

Overarching Topic:			
Why is this topic being studied at this time? How does it fit into the wider subject curriculum?	Students will be introduced to the concepts and secrets of Formula One engineering such as aerodynamics, slipstreaming, drag, turbulence, air resistance and clean air. They will then be able to develop their own prototype using advanced modelling techniques and complete the project racing their designs against each other to analyse the effectiveness of their own design considerations. This project will further develop knowledge on concepts discussed in Physics whilst also incorporating topics taught in art to aid them with their sketching skills to communicate their Formula One car designs both before making and for their evaluating. Mathematics is also prevalent within the data collection aspect of the topic.		
	Essential	**Core**	**Ambitious**
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	Can I understand basic concepts on aerodynamics and air resistance? Can I sketch the basic shape of my formula one car to be able to follow this when modelling my design? Can I use basic tools to create an F1 car from Styrofoam which follows the basic fundamentals of aerodynamics and car design? Can I test my design and record the results to compare with other members of my classes designs?	Can I understand majority of the topics; aerodynamics, slipstreaming, drag, turbulence, air resistance and clean air. Can I sketch a more detailed design of an F1 car ensuring to consider and apply the concepts of F1 car engineering? Can I create a developed and considered F1 car model created from Styrofoam using a range of tools? Can I finish my design using sandpaper to give it a smooth aerodynamic finish?	Am I able to understand all of the topics; aerodynamics, slipstreaming, drag, turbulence, air resistance and clean air to an incredibly detailed standard and be able to explain each term in detail? Can I sketch an incredibly detailed and rendered 3D design of my F1 car including annotations to explain where each F1 engineering concept has been considered and implemented? Can I create a detailed, accurate and aerodynamic F1 car model? This design should be finished using different levels of sandpaper and overall incapsulate all of the content discussed within the project. Can I evaluate all aspects of my design and create an improved sketch/model analysing

		Am I able to analyse my own and other student's car designs to understand the considerations which have created the most effective car design?	the designs of other students in the class whose cars performed the best within the testing process?
The Key Skills/ Techniques	**The sophistication and application of skills will become more advanced as students' progress through the essential, core and ambitious knowledge**		
	Skill/Technique	**How will this skill be developed?**	
	Existing F1 car design research	Students will be able to develop skills which can allow them to effectively analyse existing products which can allow them to incorporate these features into their own designs.	
	Sketching and rendering	Students will use their knowledge from the Year 7 sketching project amongst new methods shown to allow them to accurately communicate their ideas for their F1 car.	
	Using basic hand tools to create a model of an F1 Car.	Students will be encouraged to design an accurate model in teams of 2. They will need to consider the sizing of their models, the functionality of each feature when referring to topics discussed at the beginning of the project as well as understanding how to handle different tools when using a less dense material such as Styrofoam.	
	Table making and the recording of results for several experiments.	Students will create effective tables for presenting results from an experiment where they will be both analysing the effective shapes when travelling through water and once the model is built and being raced against other models.	
	Testing and evaluating.	Students will be given the skills to give detailed evaluations of their products explaining both strengths and weaknesses and be able to produce modifications for their work.	