Ravens Wood School

KS3 Curriculum Plan

Subject: Design Technology

Energy Efficiency

Overarching Topic:			
Why is this topic being studied at this time? How does it fit into the wider subject curriculum?	**Ultimate Questions**: We are challenging students to solve one of the pressing environmental needs of today. To improve the energy efficiency of home appliances. Students will be challenged to consider what the cumulative energy cost of a contemporary home is and what we can do as designers to reduce this and improve the efficiency of our homes. Ultimate questions include what is waste? Why is it important that we address waste? And what can we do as designers to reduce the carbon footprint of home-living? The task for students is to think and act like design engineers, and to come up with novel solutions when the most obvious ideas don't work. Although potentially complex, this project is on a human scale and within the experience of most students. This project is especially pertinent to contemporary home-living and the lives of our young students in the wake of covid and the rise of remote working. **Joining up:** Students will learn about different methods of energy generation, basic pricniples of electricty, efficiency and methods of modelling ideas. The context of the unit builds upon knowledge and understanding students develop in KS3 Science & Geography and allows them the opportunity to apply understanding of energy generation and sustainability, awareness of the environmental impact of design and how to factor that into producing ideas. Students will be tasked with some basic maths to calculate energy consumption in Kilowatts. This unit complements earlier units where students develop prototypes, this time using more complex material and techniques to realise ideas and learn about the role and different categories of prototypes from visualisations to working models.		
	Essential	**Core**	**Ambitious**
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	- What is energy generation? - What is sustainability? - What makes a design/idea efficient? - What environmental risks are there in the standard modern home?	- What are the most efficient methods of generating energy? - How can we develop sustainable electrical products? - How can we reduce the carbon footprint of our homes? - How can we reduce environmental risks?	- Through analysis, how can we identify the environmental risks in home products? - What factors affect the efficiency of a products function? - How can we collate and compare qualatative and quantative date from experiments?

	- What testing is used to test energy consumption?	- How can we design an accurate test of energy consumption of various products?	
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?**	
	Product Analysis	Students will investigate and analyse existing products and learn about key features and functions that contribute to energy efficiency. Students will also learn about key materials and their working+physical properties make them suitbale for use in electrical components.	
	Experimentation	Students will learn how to conduct effective experiments to test functionality and energy efficiency in electrical products	
	Engineering Sketching and CAD	Students will develop slills in engineering sketching as a method of presenting ideas and assembly diagrams from proposed design solutions, students will go onto explore the role and advanteges of CAD in realisitng these ideas.	