



Subject: Design Technology

2 Project Title: Engineering Drawing & Computer Aided Design

Overarching Topic:

Why is this topic being studied at this time?

How does it fit into the wider subject curriculum?

Ultimate Questions:

Students will have the opportunity to explore the use of engineering drawing in Design to aid in the manufacture of products through practical means. They will learn about the role engineering drawing has in design and manufacturing, its history and different methods of creating technical drawings and how they have developed. This will prepare students for communicating their design ideas ahead of the creative design modules in terms 5/6.

Students will develop the necessary skills to successfully create complex and mathematically correct technical drawings. They will, understand and be able to explain key industry terminologies and why they are important in the design and manufacturing process. Students will translate this knowledge and skills acquired in drawing to computer aided design and explore the software *2D Design*. Students will examine the role *2D Design* has in the design industry and explore its applications such as: Laser Cutting and Etching and Vector based designing.

Students will translate drawings created in *2D Design* to 3D CAD modelling software's such as SketchUp and develop to-scale 3D renderings from their original drawings. Ultimately, students will examine the role rendering has in design, its applications, benefits and implications in the field of virtual realities.

Joining up:

This project develops upon critical learning from KS3 Math's and Art including:

- Division to create scaled drawings.
- Measuring and basic arithmetic calculations.
- Using technical drawing aids such as: Set-Squares, Rulers and Isometric paper.
- Understanding and communicating spatial concepts through sketching and drawing.

	Essential	Core	Ambitious
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	<ul style="list-style-type: none"> - Can I identify and explain what Isometric Paper is? - Can I apply my knowledge of drawing to create readable technical drawings? - Can I include accurate dimensions in their drawing based on correct arithmetic's? 	<ul style="list-style-type: none"> - Can I identify and explain the uses and rationale behind isometric views in Design and Manufacturing? - Am I able to create accurate technical drawings that meet the requirements of a project specification? - Does my work include all relevant dimensions using the correct mathematical methods and scaling systems? 	<ul style="list-style-type: none"> - Can I evaluate the effectiveness and relevance of technical drawing techniques in a computer aided society? - Can I create drawings that can accurately be interpreted by a third party? - Can my drawings will show multiple elevations and accurately communicate hidden details along with relevant construction methods?
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 study existing technical drawings from areas that they will be familiar with e.g. Lego instructions and Ikea flat pack furniture.	
	2D Design CAD	Using CAD software such as google SketchUp to create accurate drawing of components. Comparing CAD software to hand drawing techniques to allow students to explore their own preferences and creativity.	
	Converting 2D designing into 3D products	Discussion and modelling of industry techniques such as 3D printing to demonstrate how a CAD drawing can be readily converted into a real product.	
	Modelling techniques	Students will use CAD software to convert 2D drawings into 3D renderings.	
	Graphical communication techniques	Students will learn a range of technical drawing techniques including isometric projection, Orthographic projection, rendering and CAD software.	
	Understanding cultural diversity	Looking at the instructions for products such as Lego (Denmark) and Ikea (Sweden) and how this is used within industry and different scales of production.	