

### Curriculum Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7	<p><b>Design and make - Money box project.</b></p> <p><b>Students will learn:</b>            How to use a steel ruler and a plastic ruler correctly and how to convert cm to mm.            The two types of natural timber and how they differ. The properties of manufactured boards.. Will gain an understanding of the advantages/disadvantages between these materials.            How to draw in oblique projection and render an object to look like plastic and wood so that students have the skills to draw ideas.            The reasons why we need to be careful when using machines/tools and then use this information to conduct practical lessons in a safe manner.            How to cut a lap joint and then draw it in oblique projection.            How to safely use a range of tools to cut the lap joints and attach the pieces together and how to clean up the</p>		<p><b>Engineering - Elastic band powered car.</b></p> <p><b>Students will learn:</b>            The four types of motion and how these are used to create machines.            The two forces that interact with vehicles and how they cause them to slow down.            How to apply the above knowledge to create a working model of an elastic band powered car.            How to cut out and make the shell for the elastic band powered car. This will be related to previous learning.            How to experiment with different wheel sizes and axle positions to gain the maximum</p>		<p><b>Design and make - Mobile phone holder.</b></p> <p><b>Students will learn:</b>            How to conduct a questionnaire to create a design brief.            How to create an idea that solves a design brief.            How to use prior learning to draw an idea for the mobile phone holder.            How to use a combination of new and prior learning to make a plastic mobile phone holder.</p>	

	<p>edges of the box using the linisher and sanding paper.</p> <p>How to draw out a slot accurately onto the lid of the money box and then to accurately cut the slot using a drill and coping saw.</p> <p>How to varnish the money box to give a good smooth finish.</p> <p>How to use CAD/CAM to make stickers to put onto the completed money box.</p>		
Year 8	<p><b>Design and make - Clock project.</b></p> <p><b>Students will learn:</b>          How plastics are made from crude oil and cornstarch. Will gain an understanding that some plastics can be melted and that some others cannot. Students will be able to identify what objects should be made from a thermosetting plastic. They will also learn how plastics can be combined with other materials to make them stronger.          Ways of making something over and over again more easily using templates. Will be introduced to the copy saw and files to make an earphone holder.</p>	<p><b>Engineering - Rockets.</b></p> <p><b>Students will learn:</b>          Who first created rockets and what they were used for.          The history of the space race.          Forces that act upon a rocket when in flight.          How to gain the greatest altitude from a rocket by applying knowledge gained about the forces acting upon a rocket.          How to produce an idea for a rocket.          How to use injection moulding to create the nose cone for a model rocket.          How to use trigonometry to work out how high the rocket goes.</p>	<p><b>Design and make - Gadget holder.</b></p> <p><b>Students will learn:</b>          How to analyse existing products to create a design specification.          How to write a design specification.          How to draw in isometric projection.          How to create an idea that solves a design brief.          How to draw in isometric projection to draw ideas.          How to use prior and new practical skills to create the gadget holder.</p>

	<p>Style and tastes have changed over the years. That many historic design styles have been influenced by things happening at the time. Will be introduced to the Memphis style from the 1980's..</p> <p>How to be inspired by a design movement to create a design for a clock.</p> <p>How to use card to model ideas.</p> <p>Will find out that a thermoplastic is best suited to make the stand as it can be bent to shape using heat whereas thermosetting plastic can only be shaped once and needs heat and pressure which makes it harder to work with.</p> <p>How to use a range of tools to clean up the edges of the plastic.</p> <p>How to use a former and a strip heater to accurately make the stand for the clock.</p> <p>What tools to use to cut out shapes for clock design.</p> <p>How to use tensol cement to attach pieces of plastic together and how to drill plastic without breaking it.</p>		
Year 9	<b>Design and make - 'Hang it all' project.</b>	<b>Engineering - Steady hand game.</b> <b>Students will learn:</b>	<b>Design and make - Photo frame.</b> <b>Students will learn:</b>

	<p><b>Students will learn:</b> Metals come from metal ore found under the ground and that all metals fit into either ferrous or nonferrous categories. Metals can be combined to create alloys. Nonferrous metals have to be annealed first before bending to prevent them from shearing. Gain an understanding of these properties which allows students to pick the best metal for a product. The tools needed to hold soft metal when working with it and the saw needed to cut it. How to use the brazing hearth safely to anneal a piece of aluminium so that it can be formed easily and without it shearing. Style and tastes have changed over the years and many historic design styles have been influenced by things happening at the time. Will gain an understanding about the art deco design movement. How to use the correct tools to safely bend the metal to shape and how to apply a screw thread to metal rod using a diestock. How to polish aluminium to a high shine. Students will understand that</p>	<p>What electricity is and how it can be made to do useful things. The difference between insulators and conductors. How electricity is measured (voltage, current and resistance). What Ohms law is. How electronic components can be assembled to make a simple circuit. How to construct a circuit for the steady hand game. How to use prior practical skills to make the shell for the steady hand game.</p>	<p>How to conduct a survey to find out what people want from a product. How to write a specification that is based on the findings from a survey. How to create an idea that solves a design brief. How to bring together prior learning to design a photo frame. How to bring together prior learning to create a plastic photo frame.</p>
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	<p>this cannot be done to all metals as ferrous metals rust.</p> <p>How to be inspired by a design movement to create a design for the 'hang it all'.</p> <p>What tools to use to cut out shapes for the 'hang it all' design.</p> <p>What tools to use to cut out the shapes for the 'hang it all' design.</p> <p>How to attach the metal hooks to the 'hang it all' and how to attach the different pieces of wood together.</p> <p>How to attach plastic to wood.</p> <p>How to neatly apply different colours of paint and how to apply it properly to gain a good finish.</p>		
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Homework Focus

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7	Working with wood		Engineering - Types of motion		The design process	
Year 8	Working with plastics		Engineering - Rockets		The design process	
Year 9	Working with metal		Engineering - Electronics		The design process	



### Enrichment Opportunities

	Year 7	Year 8	Year 9
Suggested Reading	Design and Technology ISBN: 978-1-910523-10-0	Design and Technology ISBN: 978-1-910523-10-0	Design and Technology ISBN: 978-1-910523-10-0
Suggested Viewing	Videos posted on google classroom	Videos posted on google classroom	Videos posted on google classroom
Suggested Experiences		School STEM club	School STEM club

Links to the KS3 National Curriculum

The National Curriculum	Welling Reference to the National Curriculum
Creating ideas and communicating them via drawing and modelling by researching and exploring historic design styles. Gaining an understanding of their properties and using this to correctly select the right material to use and the manufacturing techniques to make a product. Using CAD/CAM to manufacture part of a product.	Autumn Term
Gaining an understanding of mechanisms and electronics to create a successful product or model.	Spring Term
Developing specifications by referring to user needs and wants. Creating ideas that solve a problem. Evaluating existing products and using this to inform designs.	Summer Term