

Subject: Design & Technology – Resistant Materials and Product Design

Faculty Leader	Subject Leader
Mrs Emma Stott	Rebecca Gregory
National Curriculum	
The Ecclesbourne School follows the Design & Technology national curriculum.	
Curriculum Intent	
<p>It is our intent in Design & Technology to offer our students the chance to use creative thinking, problem solving and design and making skills, within a defined purpose to produce a tangible outcome. Through a variety of creative and practical activities, pupils are taught the knowledge, understanding and skills needed to engage in a process of designing and making and to understand and appreciate the creative and manufactured world around them. They work on a variety of contexts through our wide range of subject topics to design, make and evaluate a wide range of practical based projects.</p> <p>Through the study of Resistant Materials and Product Design students acquire a broad range of subject knowledge and draw on and enhance their application of disciplines such as mathematics, science, engineering, computing, ethics and art. Students learn how to and are encouraged to take risks, become resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. Our students will learn about the wider impact of global issues such as Sustainability and modern manufacturing techniques, the development of modern materials and processes to ensure that our students are equipped and empowered with the skills and knowledge that they need to make a positive difference to our society and become well rounded knowledgeable citizens.</p> <p>High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation. Our Key Stage 3 curriculum has been designed to adhere to the National Curriculum as well as underpin and feed into the Key Stage 4 curriculum.</p>	

Curriculum Implementation				
		Term	Content	Assessment
Year 7	Autumn Term	1	<p>All students have a health and safety induction and tour of the Design & Technology workshops prior to baseline assessments to ascertain prior understanding.</p> <p><u>Jigsaw puzzle project</u> Students will be introduced to the core design process and essential designing skills. Learning about the design process from consultation with a client, writing a design brief & specification through to the design and development of a design proposal for an educational jigsaw puzzle. Product analysis and suitability for different clients and age ranges. Learn about different wood categories with a focus on manufactured boards.</p>	<p>As per the National Curriculum Programme of Study at KS3 attainment targets are set in line with the subject content.</p> <p>In line with the KS3 levels students are assessed on their designing activity</p> <p>A range of skills and techniques will be assessed during the making of the product and their understanding of the properties of a range of materials</p>

Year 7		2 3	<p>Students will conduct modelling and testing to explore the suitability of design ideas and how materials respond to different tools and techniques.</p> <p>Students will then use the skills they have learnt to manufacture a jigsaw puzzle that meets their design brief and specification.</p> <p>Students will learn how to evaluate and draw conclusions about the effectiveness of their project and complete their end of project assessment.</p>	<p>Students will conduct an evaluation on their completed project.</p> <p>Teacher will feed back formatively regarding continual improvements.</p>
	Spring Term & Summer Term	4 5 6	<p><u>Nightlight project</u></p> <p>Based on a detailed specification students will apply a range of skills to this project. These will include an introductory opportunity to use electronic devices for the first time including resistors, transistors, light dependent resistors, light emitting diodes and variable resistors and the function each component performs within the circuit.</p> <p>Students to be introduced to the different categories of polymers; thermosetting and thermoplastics, and be able to identify the difference between them.</p> <p>Students will learn about vacuum forming and how to use a disc cutter, finishing edges of plastics then use this knowledge to form and cut out the base for their night light.</p> <p>Students will learn how to assemble, correctly identify components, populate and solder a printed circuit board in order to build a functioning nightlight. Students will learn about Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM), using TechSoft 2D Design and a laser cutter to create an acrylic plaque, which is illuminated and sits on the top of the vacuum formed base containing the electronics.</p> <p>Students will learn how to evaluate and draw conclusions about the effectiveness of their product.</p>	
	Term		Content	Assessment

Year 8	Autumn Term	<p>1 <u>Bauhaus trinket box project</u></p> <p>2 Students research the design school of Bauhaus and its influence on design. They research famous designers who were part of the Bauhaus movement and are able to identify the key characteristics of Bauhaus design. They will use this information to design and develop a range of design ideas for their box lids and will develop their annotation and analysis skills, in order to critically analyse and explain reasons for selecting their chosen design, linking back to the specification.</p> <p>3 Students will then re-cap and re-visit writing a brief and specification, as these are vital parts of a design process to ensure project success. They will also build on their knowledge of wood categories learning in more depth about softwoods and wood jointing techniques. The trinket box project consists of a range of wood joints that include a Lap, Comb and Domino joint. They will learn about different manufacturing processes and the use of manufacturing aids to ensure quality assurance and learn about quality control techniques in manufacturing. Students will learn how to draw Isometric projections as well as further enhance their CAD/CAM skills to design and laser cut a Bauhaus inspired lid for their box.</p> <p>Students will use their specification to review the success of their project and evaluate their products success and suggest modifications.</p>	<p>As per the National Curriculum Programme of Study at KS3 attainment targets are set in line with the subject content.</p> <p>In line with the KS3 levels students are assessed on their designing activity</p> <p>A range of skills and techniques will be assessed during the making of the product and their understanding of the properties of a range of materials</p> <p>Students will conduct an evaluation on their completed project.</p> <p>Teacher will feed back formatively regarding continual improvements.</p>
	Spring Term & Summer Term	<p>4 <u>Anglepoise Lamp Project</u></p> <p>5 Students will follow a traditional design process, refining their skills of writing a specification and investigating their client to ensure product success and suitability. These will include an introductory opportunity to use electronic devices for the first time including resistors, transistors, light dependent resistors, light emitting diodes and variable resistors and the function each component performs within the circuit.</p> <p>6 Students will refine their skills to create a poised arm made up of linkages, which will allow it to be adjusted as desired by their client. Accuracy of drilling will be achieved through the use of jigs and templates. An open brief for students to develop their own lamp shade solution out of either laser cut/engraved acrylic or ply wood, further developing and enhancing student's design decision making and knowledge of the physical and aesthetic properties of materials, whilst further refining CAD/CAM skills.</p> <p>Students will learn how to evaluate and draw conclusions about the effectiveness of their product.</p>	
	Term	Content	Assessment

Year 9	Autumn Term Spring Term	1 2 3	<p><u>Cultural themed stool project</u></p> <p>Students research into a wide variety of cultural styles of their choice. Information, imagery and influential research is collated, developed and transformed into a decorative design to suit the users needs. During the initial stages of the project, students will analyse a range of existing products and draw conclusions about the effectiveness of existing stool designs. The artwork is used as a design for a stool top using a range of different decorating techniques. Traditional woodworking methods and joints, which will build on the practical experiences they had in Year 7 and 8 to construct more complex joints such as mortice and tenons, are then used to make a softwood stool. A peer evaluation at the end of the project, reviews and compares their soft wood stool to their specification and initial research, along with testing and consumer feedback, which allows and enables students to measure the success of their product.</p>	<p>As per the National Curriculum Programme of Study at KS3 attainment targets are set in line with the subject content.</p> <p>In line with the KS3 levels students are assessed on their designing activity</p> <p>A range of skills and techniques will be assessed during the making of the product and their understanding of the properties of a range of materials</p> <p>Students will conduct an evaluation on their completed project.</p> <p>Teacher will feed back formatively regarding continual improvements.</p>
	Summer Term	4 5 6	<p><u>Anglepoise Lamp Project</u></p> <p>Students will follow a traditional design process, refining their skills of writing a specification and investigating their client to ensure product success and suitability. These will include an introductory opportunity to use electronic devices for the first time including resistors, transistors, light dependent resistors, light emitting diodes and variable resistors and the function each component performs within the circuit.</p> <p>Students will refine their skills to create a poised arm made up of linkages, which will allow it to be adjusted as desired by their client. Accuracy of drilling will be achieved through the use of jigs and templates. An open brief for students to develop their own lamp shade solution out of either laser cut/engraved acrylic or ply wood, further developing and enhancing student's design decision making and knowledge of the physical and aesthetic properties of materials, whilst further refining CAD/CAM skills.</p> <p>Students will learn how to evaluate and draw conclusions about the effectiveness of their product.</p>	

Extra-Curricular Opportunities

Access to rooms and ICT equipment in the department from 8am every morning, during breaks and lunch times and Thursday evenings until 5pm.
Access to workshops and specialist staff during breaks and lunch times to do additional or catch up/support work.

Resources

- CGP KS3 D&T KS3 Design & Technology Study Guide
- www.technologystudent.com
- www.mr-dt.com
- <https://www.bbc.co.uk/bitesize/examspecs/zby2bdm>