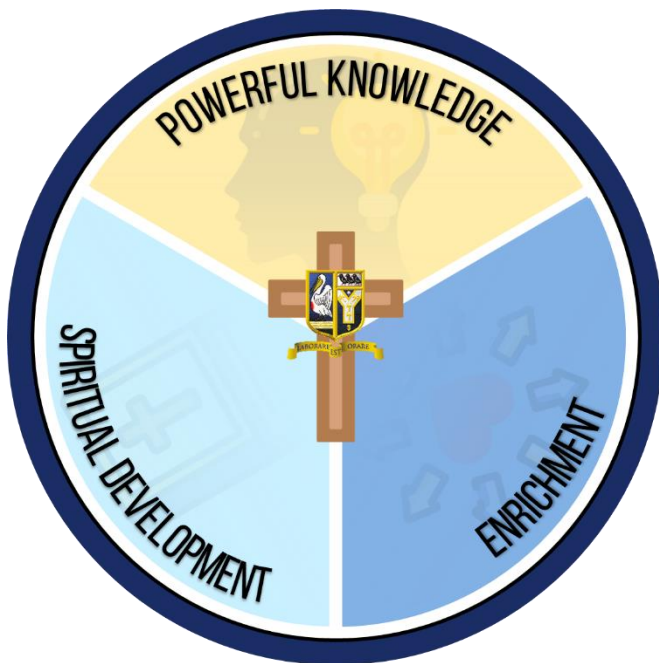


THE BECKET SCHOOL



DESIGN TECHNOLOGY

CURRICULUM INTENT



*"I HAVE COME IN ORDER THAT YOU MIGHT HAVE
LIFE
—LIFE IN ALL ITS FULLNESS."*

~JOHN 10:10

"DESIGN IS INTELLIGENCE MADE VISIBLE." ALINA WHEELER

OTHER THAN NATURE EVERYTHING ELSE THAT WE COME INTO CONTACT WITH HAS BEEN DESIGNED BY SOMEONE. THAT SOMEONE MAY BE A SPECIALIST IN SCIENCE, MATHS, AND COMPUTING, ENGINEERING OR ART BUT ALL HINGE AROUND THE UNDERSTANDING OF IMPLEMENTING THIS CONCEPT INTO A PRODUCT OR SOLUTION TO A PROBLEM.

DESIGN AND TECHNOLOGY GIVES YOUNG PEOPLE THE SKILLS AND ABILITIES TO ENGAGE POSITIVELY WITH THE DESIGNED AND MADE WORLD. THEY LEARN HOW TO PRODUCE PRODUCTS AND USE A VARIETY OF RESOURCES INCLUDING TRADITIONAL AND DIGITAL TECHNOLOGIES TO PROVIDE SOLUTIONS TO CREATE REALISTIC OUTCOMES.

INTENDED OUTCOMES

Students will:

- In year 7**, students will have focussed practical tasks including Metal monster, wooden leaf and acrylic key tag. These all have a user centred approach and provide students with knowledge and practical experience of working with woods, polymers and metals, learning methods of wasting and joining these to produce a finished product.
- In year 8**, students focus on combining wood, metal, polymers and electronics to produce a sustainable low powered desk light. They will learn about the properties of materials being used and use traditional and hand powered tools to shape and assemble these materials, learning how one interacts with another. A client based project and product geared to suit a specific target audience needs and wants. Students will learn about different design movements and will incorporate this into the product. They write a design specification taking into account the views of their intended user and other interested groups. They will use shape extraction to generate ideas and learn how computer aided design and computer aided manufacture can help to generate and illustrate finished design solutions. Students will learn how to draw and generate ideas 3 dimensionally experimenting with different communication techniques
- In Year 9:**, student focus on sustainability and build upon prior knowledge from Year 8, enhancing and embedding their knowledge and understanding of tools and processes to create a model character made from woods, metals and polymers. They revisit computer aided design to generate and render this character.
 They make a silver band ring and learn new skills associated to shaping, joining and polishing this sterling silver ring.
 They produce a mini NEA based on the theme of outdoor living. Students will gain an understanding of the iterative design, process, how to research, design, develop, test and experiment with different possible outcomes to a given product theme. They are encouraged to refine their ideas using 3D models and computer aided design.
- In KS4:** Builds on prior skills and knowledge from KS3 and has a mixture of more advanced practical skills, theoretical knowledge and design skills.
 Students will produce an NEA design folder worth 50% of their GCSE. They identify a problem linked to a context and focus on a specific user's needs and wants when researching, developing, producing and evaluating their final prototype.
- In KS5:** A Level Product Design they will investigate historical, social, cultural, environmental and economic influences on design and technology, whilst enjoying opportunities to put their learning in to practice by producing prototypes of their choice. Students will gain a real understanding of what it means to be a designer, alongside the knowledge and skills sought by higher education and employers.

CURRICULUM INTENT

POWERFUL KNOWLEDGE	<p>Students will:</p> <ul style="list-style-type: none"> • Understand that most of the items or products we interactive with on a daily basis are designed by humans, for humans for a reason. • Understand that Design and Invention provide solutions for human needs and desires. • Know that design is there to aid comfort, transport, physical needs, communication, and health and also for aesthetic reasons. • Know a range of important design movements and their origins from culture. • Gain knowledge of materials, their origins, strengths and weaknesses in subject specific areas to help to develop outcomes that are more realistic and suited to a specific target audience or client. • Have knowledge of how environmental considerations can impact design decisions and the importance of sustainable design and use of sustainable materials. • Understanding of ergonomics and anthropometrics. • Apply knowledge to the iterative design process to provide solutions to given problems. • Develop the ability to argue, justify and present research and ideas with confidence and clarity. • Explore, create, experiment and evaluate concepts to refine their purpose and validity.
SPIRITUAL DEVELOPMENT	<p>Students will:</p> <ul style="list-style-type: none"> • Be encouraged to develop positive attitudes and stoicism to the practical challenges faced. • Consider the social, moral and environmental issues surrounding design and choice of product materials. • Work independently and also in groups, they are taught to empathise with one another from the outset in Y7, they are encouraged to support their peers during challenging practical activities or where simply an extra hand would help in the workshop. • Develop a strong understanding of health and safety. They are taught to keep themselves and others around them safe at all times and to consider that their actions could have a negative consequence to themselves and others. • Develop patience, resilience, and to persevere in the knowledge that a design will not be perfect the first time around and that they must develop and hone their skills and knowledge to make a product that is fit for human needs and desires.
ENRICHMENT	<p>Students will:</p> <ul style="list-style-type: none"> • Will have the option of using the workshop facilities for Years 11 – 13 at lunchtimes to complete design or practical work. • In Year 10 visit the Jaguar Land Rover factory to see for first-hand how cars are manufactured from start to finish. • Engage with Nottingham University who run STEM activities with our KS3 students. • Learn through relevant real world contexts, learning the soft skills of perseverance, resilience, taking time and effort to strengthen their outcome. • Learn a variety of jobs that they could do using your DT qualifications and will use Unifrog to explore such pathways. • In KS5 extend their knowledge beyond the curriculum via studying topics which are part of The Becket Super Curriculum and/or Becket Read

CURRICULUM IN THE CLASSROOM

B	BEHAVIOUR IS EXCELLENT	
E	EXPERT TEACHERS	
C	COGNITIVELY ACTIVE	
K	KNOWLEDGE-RICH	
E	EMBEDDED PRACTICE	
T	TESTING-FOR-LEARNING	

HOW WILL I LEARN IN DT?

- Learning is enhanced by having expert specialist teachers who have a passion for design and sharing their knowledge and skills.
- We aim to provide practical projects where they can be active, explore new processes, materials, knowledge and skills. They learn through problem solving, making mistakes and developing a resilience to improve their outcomes.
- They will revisit skills learnt, apply new knowledge to complete outcomes that are more complex and challenging.
- At the centre of the subject is knowledge and understanding of materials, tools and processes coupled with imagination and creativity.
- Design and Technology is a subject which draws, develops and implements a range of different disciplines including mathematics, science, computing, geography and art to create relevant outcomes fit for either their own or another user's needs.

LEARNING SEQUENCE

YEAR 7

TOPIC	Metal monster <i>Steel, marking out, cutting, filing, drilling, brazing, painting,</i>	Wooden leaf <i>MDF, templates, cutting, sanding.</i>	Acrylic key tag <i>Acrylic, shape extraction, cutting, drilling, filing.</i>
EXPLANATION	In this project you will learn about different metals and how to join them to make a model metal monster. You will learn how to use hand and power tools to cut and shape mild steel. These will be joined using brazing.	In this project you will learn about the 3 main types of wood and the tools used to cut and shape them. You will make a wooden leaf.	In this project you will learn about the 2 main types of plastics and the tools used to cut and shape them. You will learn how to use shape extraction to produce creative shapes and also how to present this 3 dimensionally. You will make a plastic key tag based on this.

YEAR 8

TOPIC	Light project <i>Plywood, aluminium, polymer, drilling, sanding, filing, electronics, specification, target audience, CAD, shape extraction, generate ideas.</i>	Drawing and presentation techniques <i>Oblique, isometric, render, shape extraction, generate ideas</i>
EXPLANATION	<p>In this project you will be building on knowledge and practical skills from year 7 to produce a low voltage desktop light. You will learn about different design movements, how to extract shapes from these to create innovative graphical patterns. You will also learn about the need for a target audience and how to write a specification and produce creative light idea designs. You will learn about electronics and how to use computer aided design. Using tools and processes learned in Y7 you will make the light.</p>	<p>In this project you will focus on developing your ability to draw 3 dimensionally using oblique and isometric projection. You will learn how to render using light and shade to create life like objects whilst tackling more complex forms. Using shape extraction based on images from nature you will generate your own 3D design ideas of a product based on the theme of storage.</p>

YEAR 9

TOPIC	Cyborg <i>Plywood, softwood, acrylic, adhesives, aluminium, drilling, sanding, filing, laser cutter, orthographic projection, isometric, CAD.</i>	Silver ring <i>Silver, shape, file, solder, polish.</i>	Mini NEA <i>Research, analysis, work of others, isometric / oblique drawing, modelling, developing ideas.</i>
EXPLANATION	<p>In this project you will be using skills and processes used in Y8 to create a Cyborg. You will focus on sustainable design and social and ecological footprints before moving onto understanding the different types of polymer and their properties. You will learn about the 3 main types of wood, ferrous and nonferrous metals and their properties as well as orthographic projection. You will revisit isometric drawing, rendering techniques and CAD covered in Y8.</p>	<p>In this project you will make a silver D shape ring. You will learn how to shape the silver and how to make it the correct size, prepare the ring ready for soldering, clean the joint and polish.</p>	<p>In this project you will be exploring the theme of outdoor living. You will research existing products that meet this criteria and analyse them. You will also analyse the work of other designers from a diverse background and use their styles to influence your design ideas that meet the theme of outdoor living. You will then make models of your designs and learn how to develop these to improve the visual aesthetics and function.</p>

YEAR 10

TOPIC	Focused practical tasks	GCSE Theory	1 st June start GCSE NEA
EXPLANATION	At the beginning of year 10 you will be doing short focussed practical tasks aimed at providing you with a better understanding of the theory content that you will be covering later in the year. You will make a bridge structure looking at forces and stresses. You will make a hand tool that is case hardened and incorporates a smart material. You will also learn about different polymers and use the vacuum former to create protective packaging for a product.	<p>You will study technical knowledge on:</p> <ul style="list-style-type: none"> • <i>New and emerging technologies.</i> • <i>How energy is generated.</i> • <i>Understand developments in modern, smart and composite materials.</i> • <i>Materials – paper, timber, metals and alloys, polymers and textiles.</i> • <i>Forces and stresses, functionally, ecological and social footprint, 6r's and scales of production.</i> • <i>The work of others.</i> • <i>Making principles – tolerances, tools, equipment, techniques and finishes.</i> 	You will produce an NEA design folder worth 50% of your GCSE selecting one context from a list of 3, these are published on the 1 st June each year. You will be required to identify a problem linked to a context set by AQA. For the remainder of Y10 you will focus on analysing and evaluating existing products linked to the context, you will also identify problems linked to these products.

YEAR 11

TOPIC	NEA Section A Investigate design possibilities	NEA Section B Design brief and specification	NEA Section C Initial design ideas	NEA Section D Development of design ideas	NEA Section E Make developed product	NEA Section F Analysing and evaluating
EXPLANATION	Continue to explore the context set by AQA identifying a client or user relevant to the context and identify their needs and wants exploring the work of others to inform your ideas.	Learn to write a design brief explaining how you have considered the clients/users' needs and wants. Write a design specification detailing the specific needs and wants of the client or user and explain the importance of these.	Using your research you will produce creative and innovative ideas based on your clients or users' needs and wants using isometric or oblique projection and render techniques learned in KS3.	Using CAD and 3D model making (skills learned in Y9 mini NEA) you will improve and refine your initial design ideas in order to identify the most suitable concept for your client or user.	Using tools, materials and equipment you will make your chosen developed design using knowledge, skills and processes learned from KS3 and year 10.	Analyse, evaluate and test your product against the design brief/specification. Gather thoughts from the client/ user and identify areas that need improving or modifying in order to better meet their needs.

YEAR 12

TOPIC	Focused practical tasks	Theory	Start A Level NEA
EXPLANATION	<p>At the beginning of year 12 you will be doing short focussed practical tasks aimed at providing you with a better understanding of the theory content that you will be covering later in the year. You will learn how to cut, shape and join mild steel using Computer aided design and computer aided manufacture (plasma cutter). You will learn how to use the band saw and compete against each other to design and make a structure from a given piece of softwood that is as tall and strong as possible. You will learn how to use the laser cutter to make a slot together tea light holder. You will learn how to explore a given theme, collate, analyse and evaluate research you have gathered. Produce design solutions to the problem, needs and wants and develop these via 3D modelling and CAD.</p>	<p>You will study technical and design and making principles on:</p> <ul style="list-style-type: none"> • Performance and processing of papers, polymers, woods and metals. • Composite materials. • Industrial practise. • Inclusive design, safe working practises, protecting designs, efficient manufacturing, and design for disassembly. • Design methods, designers and their work, developments in technologies, social considerations and product life cycle. • Use of a design process, prototype development, industrial contexts, critical analysis, third party testing, tools, accuracy in design. • Environmental issues, circular economy, conservation of energy, planning for accuracy, quality assurance and quality control and standards. 	<p>You will start to produce an NEA design folder worth 50% of your A Level qualification. You will be required to identify a problem linked to a context of your choice. You will also investigate historical, social, cultural, environmental and economic influences on design and technology, whilst enjoying opportunities to put your learning in to practice by producing prototypes of your choice. You will gain a real understanding of what it means to be a designer, alongside the knowledge and skills sought by higher education and employers.</p>

YEAR 13

TOPIC	NEA Section A Identify and investigate design possibilities	NEA Section B Design brief and specification	NEA Section C Development of design proposals	NEA Section D Making of the prototype	NEA Section E Analysing and evaluating
EXPLANATION	<p>You will continue to explore your context identifying a client or user, gathering both primary and secondary methods of investigation relating directly to the design context. Produce practical experimentation and disassembly to thoroughly explore design opportunities. Using your research you will produce creative and innovative ideas based on your clients or users' needs and wants using isometric or oblique projection and render.</p>	<p>You will learn how to write a clearly stated and challenging design brief which explains how you have considered the clients or users' needs and wants. You will also write a comprehensive and detailed design specification detailing the specific needs and wants of the client or user and explain the importance of these.</p>	<p>Using a variety of modelling techniques you will develop your design proposals aiming to demonstrate originality, creativity and a willingness to take design risks. Your development will be achieved through exploration and experimentation with different materials, techniques and processes leading to an excellent quality design of a prototype for manufacture.</p>	<p>You will select and use tools, machinery and equipment including computer aided manufacture and work with a high level of skill, precision and accuracy to produce your prototype.</p>	<p>You will finally analyse and evaluate your design process as well as your prototype clearly identifying how modifications could be made to improve the outcome. You will critically evaluate your prototype against your design brief and specification and take into account the views of your user group or client.</p>