

## **Design and Technology High Level Plan**

<b>KS3 Big Questions</b>	In Design and Technology, we have Designed our KS3 curriculum to present 3 'Big Questions' to the pupils. Pupils will explore problems presented by these questions in each specialist area to develop well thought out solutions throughout each year. This will allow all pupils to develop a knowledge and understanding of how Design and Technology is used in real world environments showing that it takes all aspects of Design and Technology to develop robust, creative solutions to problems.	
<b>Rotations</b>	In KS3, Design and Technology is split into four rotations (Three in year 7). Each rotation will consist of 10/12 weeks, to learn specific new knowledge in each technology area. Procedural knowledge will be taught and developed further as students' progress through each rotation area. In each rotation pupils will follow the design process to develop Design brief, Specification, Research, Design development, Production, analysis and evaluate. Each project will refer to the overview project 'The big question' for each year group to develop in-depth procedural knowledge in each Design and Technology area. The areas covered will include Resistant Materials, Graphic Design, Electronics, Cooking and Nutrition and Product Design.	
<b>Design and Technology 3 Big Questions</b>		
<b>Year 7</b>	<b>Year 8</b>	<b>Year 9</b>
How can the canteen at Heartlands Academy be improved to provide a stimulating and proactive area for staff and students?	Birmingham City is committed to reducing the amount of household waste that goes to land fill. Along with Recycling Birmingham want to encourage the Reuse of as many waste materials as possible. Upcycling is a technique that turns waste materials into useful products. The Six R's of Sustainability, Resourcefulness.	Revitalised/modernised product – Research and identify a particular product and revitalise/ modernise that product by clearly introducing specific changes.

<b>Year 7 Rotation 1 (Resistant Materials / Electronics. Lamp project)</b>	<b>Year 8 Rotation 1 (Resistant Materials / Electronics. Speaker project)</b>	<b>Year 9 Rotation 1 (Resistant Materials- Revitalising / modernising furniture project)</b>
<p><i>Pupils will learn the Design process and why it needs to be followed to develop solutions to design problems. They will be introduced to a design brief, specification, Development of Ideas, Production of a prototype, analysis and evaluation of a product. They will develop an understanding of a range of Resistant Materials and how they can be used and the impact they have. They will learn how to use basic hand tools safely.</i></p> <p>Component 1: What is a design brief  Component 2: How to understand a write a specification  Component 3: Development of initial ideas  Component 4: Materials Hardwoods, Softwood and manmade boards.  Component 5: Components in an electrical circuit  Component 6: Workshop tools and safety  Component 7: Production techniques  Component 8: How to analyse and evaluate</p> <p><b>Resistant Materials and Electronics Assessment</b></p>	<p><i>Pupils will explore the design problem set. Using their knowledge of the design process pupils will learn how to write and analyse their own design brief and specification. Developing both their disciplinary and procedural knowledge to develop. Pupils will learn how to use more advanced equipment including power tools. Throughout this project pupils will develop their knowledge of plastics.</i></p> <p>Component 1: Analysing the design context  Component 2: Developing design brief and specification  Component 3: 6R's of sustainability  Component 4: Thermo and thermosetting plastics  Component 5: Electrical circuits and components  Component 6: How to solder  Component 7: Three-dimensional design  Component 8: Manufacturing a prototype  Component 9: Applying finishes  Component 10: Analysis and evaluation</p> <p><b>Resistant Materials and Electronics Assessment</b></p>	<p><i>Pupils will learn how global companies operate, using their knowledge of the design process. Pupils will learn to revitalise a product to sell in IKEA. Pupils will learn the scales of manufacture with a real focus on large scale production. Pupils will be able to make links to projects complete in years 7 and 8 to show how these could be upscaled. They will develop an understanding of new production and design methods.</i></p> <p>Component 1: Knock Down Fittings  Component 2: Scales of production  Component 3: Product assemblies  Component 4: Product disassembly  Component 5: Design Developments  Component 6: Computer Aided Design  Component 7: Client Correspondence  Component 8: Client feedback</p> <p><b>Resistant Materials Assessment</b></p>

Year 7 Rotation 2 (Graphic Design, Canteen design project)	Year 8 Rotation 2 (Food and nutrition)	Year 9 (Rotation 2) (Food and Nutrition)
<p><i>Pupils will learn a range of design techniques again following the design process. However, with a greater emphasis on the design development. This will progress their procedural knowledge in two and three-dimensional drawing, Design research, Anthropometrics and Ergonomics.</i></p> <p>Component 1: Analysing the Brief  Component 2: Developing a specification  Component 3: Two- and Three-dimensional drawing  Component 4: Primary and secondary research  Component 5: Anthropometrics  Component 6: Ergonomics</p> <p><b>Graphic Design Assessment</b></p>	<p><i>Pupils will learn how to plan, prepare and cook using sustainable, seasonal produce to feed a family. Pupils will use their knowledge of the 6R's of sustainability and learn how to relate these to food technology and food waste.</i></p> <p>Component 1: What is sustainability  Component 2: 6R's of sustainability  Component 3: Food safety  Component 4: Practical  Component 5: Analysis and Evaluation</p> <p><b>Sustainable Food Assessment</b></p>	<p><i>Pupils will be introduced to the popular cuisine of 'Street Food' They will learn how to make a range of mostly savoury multi-cultural meals and discover how cultural diversity is reflected across British food choices. This will enable students to learn how to cook a range of dishes safely and hygienically and apply their knowledge of nutrition. In addition, they will consider consumer issues, food and its functions and new technologies/trends in food.</i></p> <p>Component 1: Multi cultural influences  Component 2: Street Cuisine  Component 3: Dietary groups  Component 4: Client profile  Component 5: Student led practical  Component 6: Evaluations against specification</p> <p><b>Food and Nutrition Assessment</b></p>

Year 7 Rotation 3 (Food and Nutrition, Healthy foods for the canteen)	Year 8 Rotation 3 (Graphic Design project)	Year 9 Rotation 3 (Graphic design)
<p><i>Pupils will learn how to plan, prepare, cook and present healthy dishes for the academy canteen. They will learn all areas of the Eatwell guide allowing them to make judgments on developing and using a balanced diet. Pupils will learn how to create time plans based on a specification further developing their procedural knowledge.</i></p> <p>Component 1: What is healthy eating  Component 2: Eat Well Guide  Component 3: Cross -Contamination, Cleaning, Cooking and Chilling  Component 4: Technical knowledge  Component 5: Practical – knife skills, chopping boards, Health and safety.  Component 6: Reflection and evaluation</p> <p><b>Food and Nutrition Assessment</b></p>	<p><i>Pupils will learn how recycling and sustainability can be promoted through their designs to create a positive impact on the environment. They will learn how to present their findings to others through advertising design and promotional literature. Pupils will learn how we impact the environment including landfill, renewable energy, fossil fuels and be able to use the 6R's of sustainability to analyse impact.</i></p> <p>Component 1: Analysing the impact on the environment.  Component 2: Landfill  Component 3: 6R's of sustainability with a focus on recycle, reuse, reduce and repair.  Component 4: Developing a specification using ACCESSFM.  Component 5: Oblique and isometric drawing  Component 6: Promotional literature</p> <p><b>Graphic Design Assessment</b></p>	<p><i>Pupils will learn how to develop products to be sold by a major company. They will learn how to produce working drawings and technical drawings which can be recognised by manufacturing company's worldwide. Pupils will develop their knowledge on how to critically analyse both their work and the work of others allowing them to make informed judgements.</i></p> <p>Component 1: Research development  Component 2: Product analysis  Component 3: Design Brief and Specification  Component 4: Three-Dimensional Computer Aided Design  Component 5: Orthographic Projection  Component 6: Exploded Drawings  Component 7L Critical Analysis</p> <p><b>Graphic Design Assessment</b></p>

	<b>Year 8 Rotation 4 (Product Design – Upcycling project)</b>	<b>Year 9 Rotation 4 (Product Design)</b>
	<p><i>Pupils will learn how products and materials can be reused to produce new products. Pupils will learn research techniques including primary and secondary. Pupils will learn how to develop their ideas through Computer Aided Design and Computer Aided Manufacture.</i></p> <p>Component 1: What is upcycling  Component 2: Primary research  Component 3: Secondary research  Component 4: Computer Aided Design  Component 5: Computer Aided Manufacture  Component 6: Material properties  Component 7: Production of prototypes  Component 8: Presenting outcomes</p> <p><b>Product Design Assessment</b></p>	<p><i>Pupils will learn how to identify and analyse the suitability of an independently selected product sold by IKEA. Pupils will learn how to critically evaluate their chosen product to make informed decisions. They will learn how to take these judgments and transform them into a revitalised and modernised functioning product. They will develop their knowledge of the design process, Computer Aided Design, Computer Aided Manufacture alongside working with specialist tools and materials.</i></p> <p>Component 1: Research and Investigation  Component 2: Critically evaluating existing products  Component 3: Specialised Construction Methods  Component 4: Computer Aided Design  Component 5: Computer Aided Manufacture  Component 6: Prototype Manufacture  Component 7: Production of prototypes  Component 8: Presenting findings and modernised design to clients</p> <p><b>Product Design Assessment</b></p>

Year 10 Autumn Term: Core knowledge	Year 11 Autumn Term: Controlled Assessment / Core knowledge	Year 11 Autumn Term Intervention: Controlled Assessment / Electronic systems and energy generation
<p><i>Students will follow the GCSE Eduqas specification. Pupils will learn the core knowledge which will relate to all aspects of the exam and controlled assessment allowing pupils to make informed judgments and design decisions. Pupils will also develop their use of specialist workshop tools in the production of complex joining techniques.</i></p> <p>Component 1: New and Emerging Technologies  Component 2: Product Life cycle  Component 3: Finger joint production  Component 4: Global production and effects on culture and people  Component 5: Dovetail joint production  Component 6: Sustainability  Component 7: Mortise and Tennon joint production</p> <p><b>Core Knowledge Assessment</b></p>	<p><i>Students will follow the GCSE Eduqas Specification. Pupils will work independently to complete their controlled Assessment Projects set by the exam board with a focus identifying and analysing problems. Alongside this pupil will continue to learn about impact design and manufacture has on the environment.</i></p> <p>Component 1: Analysing exam brief set by the exam board (AO1 Controlled Assessment)  Component 2: Design and Technology and our world (Exam content)  Component 3: Understanding the user needs (AO1 Controlled Assessment)  Component 4: Smart Materials (Exam content)  Component 5: Writing design brief and specification (AO1 Controlled Assessment)  Component 6: Smart materials within textiles (Exam content)  Component 7: Generating and developing design ideas (AO2 Controlled Assessment)</p> <p><b>Exam content Assessment</b></p>	<p><i>Students will follow the GCSE Eduqas Specification. Pupils will work independently to complete their controlled Assessment Projects set by the exam board with a focus of developing design solutions. Alongside this pupil will continue to learn about critical evaluation. Pupils will develop their knowledge of electrical systems and energy generation</i></p> <p>Component 1: Mechanical components and devises (Exam content)  Component 2: Critical evaluation (Exam theory)  Component 3: Research (AO2 Controlled Assessment)  Component 4: Design development / Technical details (AO2 Controlled Assessment)  Component 5: Energy generation (Exam content)  Component 6: Modelling (AO2 Controlled Assessment)  Component 7: Electronic systems (Exam content)  Component 8: Prototype plan of production (AO2 Controlled Assessment)</p> <p><b>Electronics Assessment</b></p>

Year 10 Spring Term: Core Materials Knowledge	Year 11 Spring Term: Controlled Assessment / Core Knowledge	Year 11 Spring Term Intervention: In-depth Knowledge
<p><i>Students will follow the GCSE Eduqas specification. Pupils will learn how to identify and work with a range of specialist materials. Pupils will learn the working properties of a range of materials and the impact they could have on the environment and people.</i></p> <p>Component 1: Moral and ethical factors  Component 2: Natural and manufactures Timber  Component 3: Dowel joint production  Component 4: Ferrous and non-ferrous metals  Component 5: Thermo and thermosetting polymers  Component 6: Shaping and forming plastics  Component 7: Finishing Timbers  Component 8: Natural, Synthetic, Blended and mixed fibres</p> <p><b>Core Knowledge Materials Assessment</b></p>	<p><i>Students will follow the GCSE Eduqas Specification. Pupils will work independently to complete their controlled Assessment Projects set by the exam board with a focus on prototype production and analysis. Alongside this pupil will continue to learn about materials used and the impact they have on the environment.</i></p> <p>Component 1: Prototype production (AO2 Controlled Assessment)  Component 2: Manufactured Timbers  Component 3: Material finishing  Component 4: Material selection  Component 5: Analysing and evaluating design decisions and prototypes. (AO3 Controlled Assessment)  Component 6: Forces and stresses upon materials  Component 7: Respond to feed from users/ clients (AO3 Controlled Assessment)</p> <p><b>Materials Assessment</b></p>	<p><i>Students will follow the GCSE Eduqas Specification. Pupils will learn in-depth knowledge of Manufactured Timbers and boards as this is the chosen specialist area. This area will build on the pupil's core knowledge.</i></p> <p>Component 1: Manufactured timbers and boards  Component 2: Alternative Processes  Component 3: Waste and Addition  Component 4: Deforming and Reforming  Component 5: Surface treatments  Component 6: Energy production  Component 7: Computer Aided Design  Component 8: Computer Aided Manufacture</p> <p><b>Timber and Manufactured Boards Assessment</b></p>

Year 10 Summer Term: Core Knowledge	Year 11 Summer Term: Core knowledge Revision	Year 11 Summer Term Intervention In-depth knowledge revision
<p><i>Students will follow the GCSE Eduqas specification. Pupils will learn how to technological practices have developed and the impact this has on industries and people. Pupils will develop an understanding on how to understand and identify the needs and wants of target markets and clients whilst continuing to progress their use of specialist tools and construction methods.</i></p> <p>Component 1: Lap joint production  Component 2: Technological Practice  Component 3: Identify and understand client and user needs  Component 4: Investigate factors  Component 5: Testing, critically analysing and evaluating  Component 6: Investigate and analyse the work of past and present designers</p> <p><b>Core Knowledge Assessment</b></p>	<p><i>Pupils will follow the GCSE Eduqas specification revising core knowledge needed for the exam.</i></p> <p>Component 1: Design and Technology and our World  Component 2: Smart Materials  Component 3: Electronic systems and programmable components  Component 4: Mechanical components and devices  Component 5: Materials</p> <p><b>Mock Exam</b></p>	<p><i>Pupils will follow the GCSE Eduqas specification to revise their in-depth knowledge of manufactured boards and Timber</i></p> <p>Component 1: Properties  Component 2: Material selection  Component 3: Forces and stresses  Component 4: Stock forms and sizes  Component 5: Wastage, addition, deforming and reforming  Component 6: Surface Treatments.</p> <p><b>Mock Exam</b></p>