

# Creativity - Design Technology

## Our vision

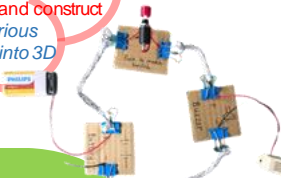
- Design and Technology is uniquely rigorous and practical subject and at its core allows students to
- Our vision is to prepare and motivate our students for a rapidly changing world by encouraging them in critical thinking skills, creativity, imagination and independence.
- Ultimately, we aim to foster skills that create problem solvers, critically looking at their made environment and defining needs before deploying resources to solve real world issues.
- We aim to instill these vital life skills, be they future designer or conscious consumers, in the form of a thorough and diverse curriculum.

# Year 7 Design & Technology

## What is my Learning Journey this year?

### Bigger Picture Questions:-

**Understanding workshop principles**  
 Consider how to adhere to safe working practices.  
**The safe use of workshop tools and equipment to creatively design and construct**  
 Consider how to manipulate various materials to make 2D designs into 3D objects



### #realworldready:

- Exploring job roles in D&T
- Working to a relatable Design Brief.

### Skills Ladder

How will you step up your skills this term?

#### Skills

- Planning for safe and accurate manufacture
- Applying practical skills and knowledge
- Understanding contexts, users and purposes
- Generating, developing, modelling and communicating ideas
- Evaluating Own ideas and products
- Evaluating existing products
- Looking at key designs and designers
- Understanding how products work and function

### What to expect...

**Content** – Be taught a range of presentation and communication techniques to improve your designing. Also applying these skills to design and make a disk tidy in the style of Alessi.

**Areas of exploration** – Designing, technology in society, designers and design movements

**Assessment** – Homework. Assessment of skills BRAGged



### Moody lights Swanky signage

Summer



### Health & Safety Scrappy circuits

Autumn

### What to expect...

**Content** – The importance and relevance of workshop safety to ensure you stay safe and produce quality outcomes. How products use interactivity to improve functionality.

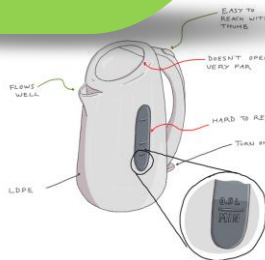
**Areas of exploration** – Environment; safety signs, floor markings & stop switches. Training, to ensure the safe use of hand tools and machinery. Basic workshop tools and equipment to create a key ring in various materials, exploration of timbers and metals.

**Assessment** – Health and Safety skills passport, Homework assessment of skills BRAGged



### Core design skills Designer desk tidy

Winter



### What to expect...

**Content** – using CAD/CAM to solve problems and make products. Modelling and prototyping circuits to be introduced into products.

**Areas of exploration** – CAD/CAM, circuits and circuit diagrams, product disassembly, exploration of polymers, product evolution

**Assessment** – Homework. Assessment of skills BRAGged. End of unit written practical assessment.

### End of Year Assessment



Brag marking of key assessment pieces throughout.

Home Learning

Produce a plan of manufacture detailing how you have made your keyrings. Include measurements, instructions and diagrams at each stage

Flipped Learning Tasks researching timber. Creating a knowledge organiser

Flipped Learning Tasks researching lighting / safety Primary research

# Year 7 D&T Curriculum Overview

Content Topic/unit name, enquiry question	Disciplinary Knowledge (Skills) Actions taken within a topic to gain substantive knowledge	Substantive Knowledge This is the specific, factual content for a topic, which is connected into a careful sequence of learning	Prior Learning (KS2)	Future learning (KS3)
<p>Transition Health and Safety introduction (mainly make)</p> <p>Materials focus – Timbers (Technical knowledge)</p> <p>Materials focus – Papers and boards (Technical knowledge)</p> <p>7 Weeks</p>	<p><b>MAKING (A)</b> Practical skills and techniques</p> <p><b>MAKING (B)</b> Planning for manufacture</p> <p><b>TECHNICAL KNOWLEDGE</b> Making products work</p>	<p>MA 1 - produce ordered sequences and schedules for manufacturing products they design, detailing resources required</p> <p>MB 1 - make use of specialist equipment to mark out materials</p> <p>MB 11 - apply a range of finishing techniques including those for material design to a broad range of materials including textiles, metals, polymers and woods</p> <p>MB 9 - use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely</p> <p>MB 6 - recognise when it is necessary to develop a new skill or technique</p> <p>TK1 - how to classify materials by structure e.g. hard woods, soft woods, ferrous and non-ferrous, thermoplastic and thermosetting plastics</p> <p>TK2 - about the physical properties of materials e.g. grain, brittleness</p> <p>TK12 - understand the properties of materials, including smart materials, and how they can be used to advantage</p>	<ul style="list-style-type: none"> <li>Selecting and using tools</li> <li>Selecting and manipulating materials</li> <li>Generating and developing ideas</li> </ul>	<ul style="list-style-type: none"> <li>Working safely in workshops.</li> <li>Learning how to risk assess and improve outcomes through quality control.</li> <li>Students should know more about timers</li> <li>Students should know more about papers and boards.</li> </ul>
<p>Scrappy circuits (Technical knowledge)</p> <p>Materials focus – Metals (Technical knowledge)</p> <p>Technology in society - Eco Design- Junk to funk (technical Knowledge)</p> <p>6 weeks</p>	<p><b>DESIGNING (A)</b> Understanding contexts, users and purposes</p> <p><b>DESIGNING (B)</b> Generating, developing, modelling and communicating ideas</p> <p><b>EVALUATING (B)</b> Existing products</p> <p><b>TECHNICAL KNOWLEDGE</b> Making products work</p>	<p>DA 3 - identify and solve their own design problems</p> <p>DB 1 - use 2D and begin to use 3D CAD packages to model their ideas</p> <p>TK 3 - how more advanced electrical and electronic systems can be powered and used in their products</p> <p>TK 4 - how to use simple electronic circuits incorporating inputs and outputs</p> <p>TK12 - understand the properties of materials, including smart materials, and how they can be used to advantage</p> <p>TK1 - how to classify materials by structure e.g. hard woods, soft woods, ferrous and non-ferrous, thermoplastic and thermosetting plastics</p> <p>DB 10 - produce 3D models to develop and communicate ideas</p> <p>DA 11 - analyse where human values may conflict and compromise has to be achieved</p> <p>EB 5 - how products can be developed considering the concept of 'cradle to grave'</p> <p>EB 2 - the positive and negative impact that products can have in the wider world</p>	<ul style="list-style-type: none"> <li>Understanding of the essential characteristics of a series circuit and experience of creating a battery-powered, functional, electrical product.</li> <li>Experience of electrical components including buzzers, switches, LEDs, resistors and batteries.</li> </ul> <p>understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]</p>	<ul style="list-style-type: none"> <li>Incorporating interactivity into products.</li> <li>Soldering circuits.</li> <li>Planning for manufacture</li> <li>Self-evaluative skills</li> <li>Gaining feedback from others</li> <li>Appreciating electronic products</li> <li>Appreciation of systems design.</li> <li>Names of electronic components, their use and functions</li> <li>Students should know more about metals.</li> </ul>
<p>Core designing skills (mainly Design)</p> <p>Technology in Society - Mobile Phone (Technical knowledge)</p> <p>5 weeks</p>	<p><b>DESIGNING (A)</b> understanding contexts users and purposes</p> <p><b>EVALUATING (A)</b> existing products.</p>	<p>DB 9 - develop and communicate design ideas using annotated sketches</p> <p><b>DB 10</b> - produce 3D models to develop and communicate ideas</p> <p>EB 2 - the positive and negative impact that products can have in the wider world</p> <p>EB3 - products that they are less familiar with using themselves</p> <p>EB 4 - products considering life cycle analysis</p> <p>EB 7 - new and emerging technologies</p>	<ul style="list-style-type: none"> <li>Basic 2D drawings skills are useful but not essential.</li> <li>Understanding of aspects to annotate against are useful, but can be done afterwards.</li> </ul> <p>Product Design: Eco Design unit to give some context for the impact of designing everyday products.</p>	<p>Looking at how products have evolved and why this is. Suggesting how products could be developed considering sustainable and environmental impact</p>

# Year 7 D&T Curriculum Overview

Content Topic/unit name, enquiry question	Disciplinary Knowledge (Skills) Actions taken within a topic to gain substantive knowledge	Substantive Knowledge This is the specific, factual content for a topic, which is connected into a careful sequence of learning	Prior Learning (KS2)	Future learning (KS3)
Designer Desk Tidy (Design and Make)  5 weeks	<b>EVALUATING (A)</b> Own ideas and products  <b>DESIGNING (B)</b> understanding contexts users and purposes  <b>MAKING (A)</b> Practical skills and techniques  <b>EVALUATING (C)</b> Key events and designers	MB 2 - use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives MB 4 - investigate and develop skills in modifying the appearance of materials. EA 1 - evaluate their products against their original specification and identify ways of improving them EA2 - actively involve others in the testing of their products	Students may have past experience of design and make cycle or iterative process. Looking at famous or iconic products or designers	<ul style="list-style-type: none"> <li>Iterative designing around a context.</li> <li>CAD/CAM skills</li> <li>Knowing influential designers, design movements and products</li> </ul>
CAD CAM- Swanky signage (Design and Make)  Materials focus – Polymers (Technical knowledge)  7 weeks	<b>DESIGNING (B)</b> understanding contexts users and purposes  <b>MAKING (A)</b> Practical skills and techniques  <b>MAKING (B)</b> Planning for manufacture  <b>TECHNICAL KNOWLEDGE</b> Making products work	DB 1 - use 2D and begin to use 3D CAD packages to model their ideas DB 7 - use a variety of approaches, for example biomimicry and user-centred design, to generate creative ideas and avoid stereotypical responses DB 9 - develop and communicate design ideas using annotated sketches EA5 - test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups TK1 - how to classify materials by structure e.g. hard words, soft woods, ferrous and non-ferrous, thermoplastic and thermosetting	<ul style="list-style-type: none"> <li>Students will know how important a logo and shop sign is.</li> <li>This prior knowledge will be built on so that students apply this to a real-life design situation.</li> </ul>	<ul style="list-style-type: none"> <li>Students explore the importance of designing an authentic, real-context product for a client to meet their specific needs, outlined in a design specification.</li> <li>CAD/CAM skills</li> <li>The final design is evaluated against the design specification.</li> <li>Students should know more about polymers.</li> </ul>
Moody lights (mainly Design) Responsive lighting product for a counter display, Night light or bedside light for a child. Mood lighting for restaurant tables.  8 weeks	<b>TECHNICAL KNOWLEDGE</b> Making products work	DA 1 - develop detailed design specifications to guide their thinking DA 9 - take creative risks when making design decisions DA10 - consider additional factors such as ergonomics, anthropometrics or dietary needs DB 1 - use 2D and begin to use 3D CAD packages to model their ideas DB 9 - develop and communicate design ideas using annotated sketches EB1 - products through disassembly to determine how they are constructed and function  TK1 - how to classify materials by structure e.g. hard words, soft woods, ferrous and non-ferrous, thermoplastic and thermosetting plastics TK2 - about the physical properties of materials e.g. grain, brittleness TK 3 - how more advanced electrical and electronic systems can be powered and used in their products TK 4 - how to use simple electronic circuits incorporating inputs and outputs	<ul style="list-style-type: none"> <li>Understanding of the essential characteristics of a series circuit and experience of creating a battery-powered, functional, electrical product.</li> <li>Experience of electrical components including buzzers, switches, LEDs, resistors and batteries.</li> </ul>	<ul style="list-style-type: none"> <li>Students can design a product to incorporate a circuit.</li> <li>Following instruction students learn soldering techniques to complete a PCB circuit for a particular purpose.</li> <li>The names and characteristics of electrical components and their associated symbols.</li> </ul>

# Year 7 D&T Curriculum Unit Core Elements

Lesson title/enquiry	Prior knowledge/links to previous years (including KS2)	Core (substantive) factual knowledge/core disciplinary knowledge- what is essential for their understanding/future learning.
1. Introduction to the workshop environment.	Assume no prior knowledge as students need to be aware of the expectations, dangers and be SJT ready in D&T.	Introduction to the workshop. Risk assessments – hazard x likelihood= risk factor Minimising risks Tool identification and identifying hazards including signage.
2. Designs and Templates and producing a plan to manufacture.  Modelling the keyring.  Focus on papers and boards	Can create basic models	How to communicate a range of designs using sketches and annotation. Know the term quality control and methods of improving quality.
3. Focus on Timbers	Have an understanding of timbers, origins and uses.	Know the term provenance and origins of timber products how to classify timbers by structure e.g. hard woods, soft wood with specific examples understand the properties of timbers and how they can be used to advantage Know how they are converted and into what stock forms Know common manufacturing, joining and finishing techniques.
4. Manufacturing the wooden keyring	May have used tools to mark out, manipulate and transform timbers.	Identify, select and apply correct tool use for timbers. use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely – pillar drill, sander, coping saw, glass paper.
5. Manufacturing the plastic key ring	May have used tools to mark out, manipulate and transform polymers.	Identify, select and apply correct tool use for Polymers. use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely – laminating, tenso, scroll saw, files, wet and dry paper
6. Manufacturing the metal key ring.	May have used tools to mark out, manipulate and transform metals .	Identify, select and apply correct tool use for Metals. use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely – pillar drill, hack saw, tin snips, files
7. Adaptation week	N/A	Use for any lost curriculum time(i.e. finishing units), MAD time, Feedback and assessment.

# Year 7 D&T Curriculum Unit Core Elements

Lesson title/enquiry	Prior knowledge/links to previous years (including KS2)	Core (substantive) factual knowledge/core disciplinary knowledge- what is essential for their understanding/future learning.
1. Electronic components <ul style="list-style-type: none"> <li>• Input, process, outputs</li> <li>• Resistors</li> <li>• Circuit diagrams</li> </ul>	Students should have some basic understanding of electronics.	<ul style="list-style-type: none"> <li>• Circuit symbols and using the ability to link them to design circuit diagrams.</li> <li>• Knowledge of what a component looks like, its symbol and function.</li> <li>• Principles of Input, Process and Outputs.</li> <li>• Resistors, their functions and the ability to identify different values.</li> </ul>
2. Making the scrappy blocks Testing the scrappy circuits!	Students will be familiar with working with materials such as corrugated cardboard to create simple shapes.	<ul style="list-style-type: none"> <li>• Electronic components – symbols, appearance and functions.</li> <li>• Inputs, Process and Outputs.</li> <li>• Resistors, functions and identification of values using colour charts.</li> <li>• Designing circuits in Series and Parallel.</li> </ul>
3. Designing circuits for contexts	Students should have experience of simple circuitry and also modelling ideas and concepts	<ul style="list-style-type: none"> <li>• Students will physically explore and design circuits through interlinking components using the Scrappy Circuit blocks. Designing through physical prototyping.</li> <li>• The ability to then visualise actual products of which the designed circuits can be embedded into.</li> </ul>
4. Technology in society- 6 R's and eco design challenge.	Know ethical and moral responsibilities when designing and consuming products.	<ul style="list-style-type: none"> <li>• Understanding implications of designing products in the real world.</li> <li>• Environmental issues affecting every product being produced.</li> <li>• Using sketches and annotation to help communicate solutions.</li> </ul>
5. Materials focus - Metals	Have an understanding of metals, origins and uses.	Know the term provenance and origins of metal products . how to classify metals by characteristics e.g. alloys, ferrous with specific examples. understand the properties of metals and how they can be used to advantage . Know how they are converted and into what stock forms. Know common manufacturing, joining and finishing techniques involving metals.
6. Buffer week	N/A	Use for any lost curriculum time(i.e. finishing units), MAD time, Feedback and assessment.

# Year 7 D&T Curriculum Unit Core Elements

Lesson title/enquiry	Prior knowledge/links to previous years (including KS2)	Core (substantive) factual knowledge/core disciplinary knowledge- what is essential for their understanding/future learning.
1. One and two point perspective Linework, shading and rendering.	<ul style="list-style-type: none"> <li>• Basic 2D drawing skills are useful but not essential.</li> <li>• Perspective and how we view the world.</li> <li>• What makes something look convincing/real?</li> </ul>	What defines perspective drawing? – spot the features. Vanishing points Horizon lines How to draw lines leading back to vanishing points. One and two point perspective. Thick and thin lines Shading on 3 faces- light to shade. Mimicking materials.
2. Isometric drawing – how to use an isosketch – drawing an isometric dice	Building on perspective techniques previously introduced. Idea of fitting complex shapes in boxes. Angles and measurements.	What defines isometric drawing? – spot the features. How is it different, what are the advantages over 1 and 2 point. Use of grid paper to draw basic shapes. Crating – a how to Features of the isosketch- bump tools, corner radii, ellipse tools, orientation Practice of mark making and orientation- student led activity with scaffolded examples. Practice first product drawing with isosketch- dice.
3. Birdhouse, cup using an isosketch	Developing knowledge of the features and traits of an isosketch and how they can be built upon to add complexity to isometric drawings.	Extending and crating to accommodate bigger drawings  Planning sketches, alignment and placement Faces and axis Use of ellipse tools
4. Toaster using isosketch, annotation design ideas and adding relevant information.	Understanding of aspects to annotate against are useful, but can be done afterwards. How to communicate feature such as assembly and movement in drawings.	Drawing on all previous features and skills with isosketch and addition of mouth tool and creating bigger crates for drawings.  What is design communication? Why is it important? ACCESS FM and adding annotation and communication.
5. crating and sketching.	Isometric and two point leading to free drawing of objects	Breaking objects down in to simple forms. Creates around existing objects. Free crating and drawing objects.

# Year 7 D&T Curriculum Unit Core Elements

Lesson title/enquiry	Prior knowledge/links to previous years (including KS2)	Core (substantive) factual knowledge/core disciplinary knowledge- what is essential for their understanding/future learning.
1. 2D design tools introduction, designing / sketching out their design and concept for the desk tidy.	<ul style="list-style-type: none"> <li>Use of CAD packages at primary school</li> </ul>	<p>Students will be introduced to the main tools and features of 2D design tools.</p> <p>They will be taught how to set up files, draw to scale and/or other similar settings.</p> <p>2D design tools and features covered: page setup, grid setup, navigation tools, undo issues, line and spline tools, trim and delete, editing nodes and handles to improve work.</p>
2. Designing the form for the base using 2D CAD	<p>Introduction to 2D design tools</p> <p>Sketch work</p> <p>Communicating ideas</p> <p>Design icons</p>	<p>Students will generate a concept for their pencil holder in the Alessi style. They will take a sketched concept and refine this idea using CAD. This will form the baseplate component.</p> <p>Transfer of ideas to CAD to better control parameters of the design .</p> <p>How to sketch elevations</p> <p>Taking a sketch and converting it to a CAD Design</p> <p>Using CAM (laser cutter) to cut out the design</p>
3 how to mark out and manufacture	<p>Earlier unit and key workshop processes of:</p> <p>Marking out</p> <p>Cutting and shaping</p> <p>Finishing</p>	<p>Moving from CAD into the workshop students will mark out, cut and form and drill an accurate array of blind holes.</p> <p>Using templates to mark out for greater accuracy.</p> <p>Quality control measures to improve outcomes.</p> <p>Safe use of machinery including cordless and bench drills, disk sanders and hand tools.</p> <p>Marking and manufacture to specific criteria (size, array and depth of holes for pen holder component).</p>
4. Finishes of materials	<p>Earlier unit and key workshop processes of:</p> <p>Marking out</p> <p>Cutting and shaping</p> <p>Finishing</p>	<p>Students will work on both components</p> <p>How finishes improve functionality and aesthetics.</p> <p>Materials and their finishes</p> <p>Applying a stain to the MDF pen holder.</p>
5. Assembling materials	<p>Joining methods</p> <p>Theoretical and practical knowledge.</p>	<p>After manufacturing and finishing, students will join their materials together to create a whole and functioning desk organiser.</p> <p>How joining methods can be permanent or temporary.</p> <p>Joining materials together like to like and dissimilar.</p> <p>Adhesives, joints,</p> <p>Completion of the project with joining the CAM laser cut base plate and</p>



# Year 8 Design & Technology

## What is my Learning Journey this term?

### #realworldready:

- Jewellery making
- Working to a live brief
- Identifying a client



### What to expect...

**Content** – Understand and demonstrate how to safely work with metal using a range of processes.

**Areas of exploration** – Health and safety, Analysing a context, product analysis, designing, mould creation, Casting, Ferrous, Non-Ferrous and Alloy Metals, fettling,

**Assessment** – Ongoing live BRAG marking of work, written assessment of skill, peer and self assessment

## Salad Servers Mainly Making

### What to expect

by the end of the unit you will be able to:

- learn about manufacturing techniques and safe working procedures in the workshop
- learn how to select materials and manufacturing techniques appropriate to them
- learn how to analyse everyday products and identify their physical properties
- demonstrate how finishing techniques can enhance the material or product

### What to expect...

**Content** – Designing an item for a table in a chosen setting/occasion of your choice.

**Areas of exploration** – looking at different scenarios/functions to design for. Writing specifications. Different designing methods

**Assessment** – Communication of designs, modelling, practical quality outcome

### Skills Ladder

How will you step up your skills this term?



#### Skills

- Health and safety
- Demonstrate safe working practices
- Marking out and measuring (mm, ml, g)
- Understanding different categories of metals
- Understanding different categories of Plastics
- Working with plastics – cutting, shaping and finishing
- Sustainability
- Product analysis
- Designing
- Metalwork casting
- Fettling metal
- Design and development of ideas
- 2D/3D Drawing
- Nets of shapes
- Modelling
- Press forming
- Strip heating
- Line drawing
- Annotation
- Presentation

## Tablecenter Piece Design and make

By the end of the unit you will:

- Analyse and brainstorm a context.
- Construct and work from a simple design specification.
- Use the specification to inform the design of a product that meets a scenario.
- Understand how to avoid fixation using a designer's toolbox technique.
- Develop and communicate ideas using sketching, drawing, 3D modelling and practical prototyping.

## Pewter Jewellery Design and make

By the end of the unit you will be able to:

- research and develop a brief from a given scenario
- know and understand how to approach a design problem
- know how to develop a specification
- know how to and be able to generate ideas and communicate them
- know how to use 2D/3D software to make models and test out your design
- know how to make informed decisions about your design and its manufacture
- know how to produce a tool path and manufacture a mould using CAD/CAM
- know how to cast and finish your designed product

### Bigger Picture Questions:-

Recap on workshop principles

Using new materials to create various projects. Safe working with metal and plastics. Heat forming. Casting. Understanding sources of how plastics and metals are formed

START

## Acrylic Desk Tidy



### What to expect

**Content** – Design and make a small storage system from a net/development in acrylic sheet.

Understanding materials using a range of acrylic shaping and moulding techniques

**Areas of exploration** – Health and safety, Cutting acrylic, Shaping acrylic with files, Draw filling edges and finishing, Creating formers for moulding, Heating and forming plastic, Joining plastics, Press forming plastics sheets, Drilling with a depth stop, Quality finishes

**Assessment** –

'Mainly Making' Quality of finish and accuracy.

Flipped Learning Tasks researching plastic theory and sustainability issues

Home Learning

Creating a knowledge organiser about metals and alloys.

Drawing skills and presentation booklet

# Year 8 Curriculum Overview- Subject

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<p>Design, make, evaluate an acrylic Desk storage solution</p> <p>Materials focus – Polymers</p> <p>The project will be based around using the strip heater to manipulate plastic into various shapes. They will develop templates and nets to help construct their solution as well as developing their design skills using oblique designing techniques. A focused practical task at the start of the project will be done to develop their skills for the main project. (Autumn)</p>	<p><b>Designing</b>            Designing a functional product. generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p> <p><i>Making</i>  <i>Health and safety, Cutting acrylic, Shaping acrylic with files, Draw filing edges and finishing, Creating formers for moulding, Heating and forming plastic, Joining plastics, Press forming plastics sheets, Drilling with a depth stop, Quality finishes</i></p> <p><i>Evaluating</i>  <i>Testing a product to see if it is fit for purpose. Self assessment and p</i></p> <p><i>Technical knowledge</i></p>	<p>MA 7 - select appropriately from specialist tools, techniques, processes, equipment and machinery, including computer-aided manufacture</p> <p>MB 1 - make use of specialist equipment to mark out materials</p> <p>MB 7 - follow procedures for safety and hygiene and understand the process of risk assessment</p> <p>MB 8 - use a wider, more complex range of materials, components and ingredients, taking into account their properties</p> <p>MB 9 - use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely •</p> <p>MB 11 - apply a range of finishing techniques, including those from art and design, to a broad range of materials including textiles, metals, polymers and woods</p> <p>TK1 - how to classify materials by structure e.g. hard woods, soft woods, ferrous and non-ferrous, thermoplastic and thermosetting Plastics</p> <p>TK2 - about the physical properties of materials e.g. grain, brittleness,</p>	<p>General Health and Safety will be built on and referred to from previous projects reiterating its importance. Skills demonstrated in this will lead on from their previous project and introduce a plastics forming process.</p>	<ul style="list-style-type: none"> <li>Students will have pushed themselves out of their comfort zones to explore wider and more sophisticated and challenging techniques. Excellent standards of finish will have been achieved independently through practical outcomes. Students can articulate the process and justify design choices and skills and technique used, which supports the development through KS3 and into KS4</li> <li>All of these skills will feed in to the Year 9 curriculum which allows students to combine all material areas they have developed knowledge and skills of in Year 7 and 8.</li> </ul>

# Year 8 Curriculum Overview- Subject

<b>Content</b> Topic/unit name, enquiry question	<b>Disciplinary Knowledge (Skills)</b> Actions taken within a topic to gain substantive knowledge	<b>Substantive Knowledge</b> This is the specific, factual content for a topic, which is connected into a careful sequence of learning	<b>Prior Learning (KS2)</b>	<b>Future learning (KS3)</b>
<p>Jewellery Design To design and make an item of jewellery based upon 20<sup>th</sup> century design movements. It must reflect the essential features of the movement. (Autumn/spring)</p>	<p><b>DESIGNING</b> Designs are created by using any relevant sources of inspiration, mood boards are used in this example, but existing products, material handling trays and collections of artifacts could be also used</p> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>The mould is made from MDF/ply by either using a laser cutter or by hand; the pewter is heated and poured into the mould to make the piece of jewellery. Hand finishing techniques are then used to finish the surface of the work.</li> </ul> <ul style="list-style-type: none"> <li><b>Evaluating</b> Designs are evaluated and compared to the specification before moving on to making.</li> <li><b>Technical knowledge</b> This is potentially relevant at all times.</li> </ul>	<p>DA 2 - use research including the study of different cultures, to identify and understand user need DA 9 - take creative risks when making design decisions DB 2 - produce models of their ideas using CAM to test out their ideas DB 4 - use CAD and related software packages to validate their designs in advance of manufacture DB 5 - use specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations DB 9 - develop and communicate design ideas using annotated sketches MA 7 - select appropriately from specialist tools, techniques, processes, equipment and machinery, including computer-aided manufacture MB 11 - apply a range of finishing techniques, including those from art and design, to a broad range of materials including textiles, metals, polymers and woods TK 7 - how materials can be cast in moulds TK 8 - how to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines</p>	<ul style="list-style-type: none"> <li>Experience of evaluating the success of a product if a student has made something for another person.</li> <li>Understanding that some features of a product are desirable, and others are essential</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>Students understand how a designer works for others and can understand their needs/wants</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>Students are developing a range of skills, using a range of materials and techniques in a safe manner understanding the need of risk assessments</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>Self evaluation of what has been learned.</li> <li>Peer evaluation of the final product against the design specification.</li> </ul> <p><b>Technical knowledge</b> Greater understanding of material properties and characteristics for use.</p>

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<p>Salad Servers – Mainly Making</p> <p>Students will manufacture a product manufactured from timber, using the laminating process, which will be a functional salad server.</p> <p>Eating together, bending materials, product analysis, ergonomics &amp; anthropometrics, user experiences, evaluating designs through modelling, formers.</p> <p>(spring)</p>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>Students will begin the designing element of the project by going straight into modelling thus educating them that there can be multiple ways to begin designing.</li> </ul> <p>Students will use the in project developed knowledge of Ergonomics and Anthropometrics to manufacture their products.</p> <ul style="list-style-type: none"> <li>Students will use product analysis and user experiences as a driving force of design.</li> <li>Modelling is the predominant tool use when designing – no sketching takes place.</li> <li>Develop students' knowledge of materials, manufacturing techniques and how to apply these.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>Students will use pre-made formers to bend their designs into a curvature shape using the laminating process.</li> <li>Shaping will take place using hand tools and/ or appropriate workshop machinery.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>Evaluating existing products and own designs as the project progresses.</li> </ul> <p><b>Technical knowledge</b></p> <ul style="list-style-type: none"> <li>Timbers, laminating, use of formers, use of star diagrams as an evaluative tool.</li> </ul>	<p>DA 3 - identify and solve their own design problems                      DA 4 - develop design specifications that include a wider range of requirements such as environmental, aesthetic, cost, maintenance, quality and safety                      DA10 - consider additional factors such as ergonomics, anthropometrics or dietary needs                      DB 5 - use specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations                      DB 6 - combine ideas from a variety of sources                      DB 8 - decide which design criteria clash and determine which should take priority                      DB 10 - produce 3D models to develop and communicate ideas                      MB 7 - follow procedures for safety and hygiene and understand the process of risk assessment                      MB 9 - use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely •                      MB 11 - apply a range of finishing techniques, including those from art and design, to a broad range of materials including textiles, metals, polymers and woods                      EA 3 - select appropriate methods to evaluate their products in use and modify them to improve performance                      EA 4 - produce short reports, making suggestions for improvements                      EA 5 - test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups                      TK 16 - use learning from science to help design and make products that work                      TK 17 - use learning from mathematics to help design and make products that work                      TK 18 - understand the properties of materials, including smart materials, and how they can be used to advantage.</p>	<p>Yr 7 - Students will have knowledge of the workshop and the ability to use a range of hand tools and workshop machinery.</p> <ul style="list-style-type: none"> <li>Students will have previous experience working with timbers.</li> </ul>	<p>A greater understanding of materials and processes which informs future design possibilities and outcomes, making it possible to be more creative with an understanding behind what they know is possible to achieve.</p>

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<b>Content</b> Topic/unit name, enquiry question	<b>Disciplinary Knowledge (Skills)</b> Actions taken within a topic to gain substantive knowledge	<b>Substantive Knowledge</b> This is the specific, factual content for a topic, which is connected into a careful sequence of learning	<b>Prior Learning (KS2)</b>	<b>Future learning (KS3)</b>
<p>Design and Make Table Centerpiece</p> <p>Students will design and model (with the potential to manufacture) a product that is used on a table. They will be required to illustrate the scenario and function for the product within their work. Design specifications will be used to inform the designing. A manufacturing specification can also be produced in support</p> <p>(Summer)</p>	<ul style="list-style-type: none"> <li>• <b>Designing</b></li> <li>• <i>Using design criteria to develop suitable design ideas and proposals. Utilising supporting research.</i></li> <li>• <b>Making</b></li> <li>• <i>Linked to making models and prototypes, using modelling based materials and techniques. Using hand tools and specialist machinery. Working from manufacturing plans and drawings. Producing a cutting list of materials and components.</i></li> <li>• <b>Evaluating</b></li> <li>• <i>Reviewing ideas and proposals against success and design criteria, .</i></li> <li>• <b>Technical knowledge</b></li> <li>• This is potentially relevant at all times</li> </ul>	<p>DA 3 - identify and solve their own design problems                      DB 5 - use specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations                      DB 9 - develop and communicate design ideas using annotated sketches</p> <p>MB 2 - use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives                      MB 7 - follow procedures for safety and hygiene and understand the process of risk assessment                      MB 9 - use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely •                      MB 11 - apply a range of finishing techniques, including those from art and design, to a broad range of materials including textiles, metals, polymers and woods</p>	<p>Yr7 - Experience of manipulating workshop based hand tools and machinery.</p>	<p>A greater understanding of materials and processes which informs future design possibilities and outcomes, making it possible to be more creative with an understanding behind what they know is possible to achieve, this is a good grounding towards GCSE practices.</p>

# Year 8 Design & Technology Curriculum Unit Core Elements

Lesson title/enquiry,	Prior knowledge/links to previous years (including KS2)	Core (substantive) factual knowledge/core disciplinary knowledge- what is essential for their understanding/future learning.
Acrylic Storage unit 1. Drawing techniques – 2D – 3D oblique. How to present ideas clearly (slides 1-8)	How to communicate own ideas. Knowing the difference between 2D and 3D presentations..	Design Skills and Presentation: Slides  Introduce students to Oblique drawing task.  Students create 3D shapes from 2D ones using oblique drawing and add shading/colour using skills/principles from Art.
2. Focused practical task: Device storage (slide 9 - 10) (Designing) Print slide 9 / student And Slide 1 from plastics investigation homework power point	Previous knowledge on plastics? Modelling/templates	Introduce task and get students to do single line quick sketches of possible ideas. Then create double line and use oblique drawing skills to create 3d drawings. Can use 2D Design sheet or students draw in books.  Create card model templates for final idea create a card mock up with fold lines and measurements. Talk about templates and their importance. Measuring accuracy to ensure a working product and less waste. Homework - to explore plastic as a material
3. Focused practical task: Device storage (slide 12 Print slide 12/student	Familiar tools and equipment from Yr 7 Pillar drill, Coping saw, file	Why do we model ideas? How to mark out designs on materials for accuracy . Introduction to specific tools. Eg Strip heater, Wet & dry paper How to cut and finish plastic for a quality outcome.
4. Focused practical task. Print slides 16 and 18		Complete practical and check understanding of tools used. Strip heater knowledge check sheet. Evaluation/Reflection on focused practical task.
5. Introduction to Challenge Print slide 19  Task Analysis	Previous knowledge on plastics? How to complete a Task Analysis. What a Task Analysis is?	Recap on plastics and how they are a reliable material to use in D&T. Introduce Design Brief  How to break down a Design Brief by carrying out a task analysis looking at all the possibilities they can explore. This is to get students thinking about possible solutions, clients, locations and types of product. Encourage creative layout using colour.
6. Product analysis (slide 25) Print slide 23/student	Investigating products	Health and safety rules reminder How to analyse an item/product in detail in order to understand more about it.  2D Design presentation/drawing skills – how to come up with ideas quickly and present these ideas quickly
7. Design ideas & development drawing skills	2D and 3D shapes	Clear presentation skills of ideas with annotation to explain key features
8. Card modelling, marking out, practical		Creating templates, marking out accurately, quality finish to acrylic plastic. Strip heater to bend plastic safely.
9. Practical lesson bending plastic		Bending plastic. Teat and evaluate product.

# Year 8 Design & Technology Curriculum Unit Core Elements

Lesson title/enquiry,	Prior knowledge/links to previous years (including KS2)	Core (substantive) factual knowledge/core disciplinary knowledge- what is essential for their understanding/future learning.
Jewellery Unit 1. Understanding/analysing a design brief. 2. Specification requirements 3. Research/investigation	Understanding that some features of a product are desirable, and others are essential Previous skills in research and collecting of information/ inspiration.	Analysis the task given to break it down and improve understanding.  Students use the specification given and learn how to adapt it to suit a real specific person, focusing on their needs and wants. Demonstrate using some existing examples.  If access to computer (or homework) students are asked to create a mood board based on a design movement – e.g. Art Deco (, Memphis(Ettore Sottsass, Aldo Rossi, Philippe Starck), Art Nouveau (Louis Comfort Tiffany) and Arts and crafts movement (Charles Rennie Mackintosh, William Morris)
Design Strategies	Basic line drawing skills, presentation of ideas skills, how/why to annotate	Using a moodboard to generate simple 2D line drawings based on the shapes and characteristics seen. Use the viewfinder technique to create by zooming into areas they may not have seen from looking at the whole piece. Consider presentation skills – fineliner, colour etc
Development of ideas  Making informed decisions	Use of ideas and specification to develop for a specific audience. No design fixation	Avoid design fixation and develop initial shape designs into more jewellery like parts, considering the functions of the piece and how the material (pewter) could flow into the mould. Size restrictions may dictate developments. May consider 3D effect, may model in card layering to create more complex designs that could allow infill of colour.
CAD designing for mould	2D design basic skills from Yr 7 Maths – 2D shapes, measurements/dimensions	Recap on using 2D design software Understanding of pewter casting process to design the appropriate mould. Follow the given process to create an accurate and workable mould to cast pewter into. CAD files can then be laser cut ready for casting process.
Practical - Pewter casting process	How moulds work in general eg jelly mould. Safety understanding from previous practical work and science experiments	Understanding the Pewter Casting Process and how to do it safely from set up to complete casting. Knowledge of Pewter as a material and its uses.
Practical – finishing processes	Basic workshop tools previously used with other materials	Understanding and demonstrating how to achieve a quality finish on a metal product using the correct equipment.
Reflection, assessment	Self reflection against given criteria. Understanding how to improve.	How well have students achieved the learning objectives



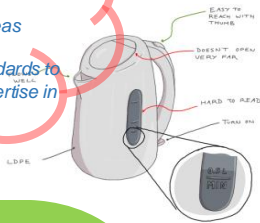
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Salad servers unit (mainly making) Understanding the context Exploring the task	Thinking around a context to come up with ideas	Existing product knowledge, relating life experience to the context. How we use handheld items?, how do we transfer an item from one place to another?
Anthropometrics	Understanding that we are all different shapes and sizes and that this changes as we grow/age.	Understanding anthropometric data and how/why it is used. Collecting a sample from the class using the appropriate units (mm) then using numeracy skills to find the mean average.
Product analysis	Products usually have at least one function/purpose.	Positive and negative features to guide design considerations
Modelling	Basic skills with cutting tools and assembly	Cardboard modelling based on demonstration. Model the existing product and then can develop the design using further models
Ergonomics  Development	Knowing that products are made to 'fit' us in certain ways. Our first idea isn't always our best idea and we can develop ideas based on further information.	Introduction to ergonomics. Use a star diagram to evaluate the ergonomics of their model.
Materials knowledge	Working with wood in Yr7, cutting it out and what tools are appropriate.	How to bend timber - steam bending, kerf-cutting, living hinge, examples shown to demonstrate. How it works.
Design Specification	We need criteria to check if things are correct. The criteria is decided on various factors	Understand why a specification is important. Write a design specification considering; function, size, material properties, aesthetics, user needs, ergonomics and safety.
Manufacture	Workshop safety and basic use of tools to develop further.	Former made and students choose which one to laminate the wood parts. Marking out and cutting/shaping and finishing
Manufacture	Different materials can have different 'finishes' applied	Surface finishes- appropriate to food based products.
Evaluation and testing	Evaluating allows us to see where we are at and how to improve..	How to write use the specification to evaluate the appropriateness of the finished product.



**Bigger Picture Questions:-**

- How can I use my skills in design and technology to solve problems?
- How can I communicate my ideas effectively?
- How can I present to high standards to demonstrate my skills and expertise in D&T?



# Year 9 Design & Technology

## What is my Learning Journey this year?

**#realworldready:**

- Exploring job roles in D&T
- Working to a reliable Design Brief.

**Skills Ladder**  
How will you step up your skills this term?



- Skills**
- Planning for safe and accurate manufacture
  - Applying practical skills and knowledge
  - Understanding contexts, users and purposes
  - Generating, modelling and communicating ideas
  - Evaluating Own ideas and products
  - Evaluating existing products
  - Looking at key designs and designers
  - Understanding how products work and function

### What to expect...

**Content – continuation of Design Ventura working towards your teams final submission of x3 A3 pages to present to the DESIGN MUSEUM, London. Exploration of Areas of exploration – Designing, Making, Evaluating products technology in society, designers and design movements**

**Assessment –**  
Presentation. Competition entry  
Assessment of skills BRAGged



### StarPack (competition) Serpentine Pavilion

Summer



**START**

**Core design skills Design Ventura (competition)**

Autumn

### What to expect...

**Content –developing a range GCSE+ level design presentation skills, Launch of Design Ventura where in teams you will have the opportunity to enter a competition to make the next product in the DESIGN MUSEUM, London, Gift shop.**

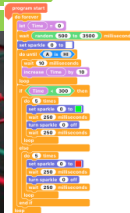
**Areas of exploration –**  
Understanding contexts, Designing and model making, presenting ideas, planning and budgeting, evaluating you're own ideas and products.

**Assessment–**  
A presentation, Homework assessment of skills BRAGged



### Design Ventura (competition) Crumble kits

Winter



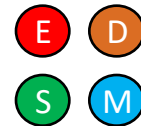
### What to expect...

**Content –** The role of architects and building in society, gathering primary data designing and modelling a prototype. Producing an entry to another external packaging competition with good prizes! Applying all your problem solving skills!

**Areas of exploration –** CAD/CAM, design and making, packaging, functions of packaging, ethical and social issues

**Assessment–** Homework. Competition entry, Assessment of skills BRAGged. End of unit written assessment.

### End of Year Assessment



Brag marking of key assessment pieces throughout.



Investigating architects and producing a design

Flipped Learning Tasks researching timber. Creating a knowledge organiser

Investigating architects and producing a design

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Core design skills  7 weeks	<b>DESIGNING (A)</b> Understanding contexts, users and purposes  <b>EVALUATING (B)</b> Existing products	DB 9 - develop and communicate design ideas using annotated sketches <b>DB 10</b> - produce 3D models to develop and communicate ideas  EB 2 - the positive and negative impact that products can have in the wider world EB3-products that they are less familiar with using themselves EB4- products considering life cycle analysis	<ul style="list-style-type: none"> <li>Basic 2D drawings skills are useful but not essential.</li> <li>Understanding of aspects to annotate against are useful, but can be done afterwards.</li> <li>Product Design: Eco Design unit to give some context for the impact of designing everyday products.</li> </ul>	AQA 8552  3.3.4 Design strategies
Design Ventura 1  6 weeks	<b>MAKING (B)</b> Planning for manufacture  <b>DESIGNING (A)</b> Understanding contexts, users and purposes  <b>DESIGNING (B)</b> Generating, developing, modelling and communicating ideas  <b>EVALUATING (B)</b> Existing products	<ul style="list-style-type: none"> <li>use research and exploration, such as the study of different cultures, to identify and understand user needs</li> <li>identify and solve their own design problems and understand how to reformulate problems given to them</li> <li>develop specifications to inform the design of innovative, functional, appealing products that responds to needs in a variety of situations</li> <li>use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses</li> <li>develop and communicate design ideas using annotated sketches, detailed planes, 3-D and mathematical modelling, oral and digital presentations and computer-based tools</li> </ul>	<ul style="list-style-type: none"> <li>Contexts - analyzing and finding opportunities</li> <li>Iterative design processes</li> <li>Responding to a target markets needs and wants</li> <li>Using research to inform ideas</li> <li>Developing specifications</li> <li>Initial design ideas</li> </ul>	AQA 8552  3.3.5 Communication of design ideas  3.3.6 Prototype development
Design Ventura 2	<b>MAKING (A)</b> Practical skills and techniques  <b>MAKING (B)</b> Planning for manufacture  <b>EVALUATING (A)</b> Own ideas and products  <b>EVALUATING (C)</b> Key events and designers  <b>TECHNICAL KNOWLEDGE</b> Making products work	<ul style="list-style-type: none"> <li>understand and use the properties of materials and the performance of structural elements to achieve functioning solutions</li> <li>select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture</li> <li>select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties</li> <li>analyse the work of past and present professionals and others to develop and broaden their understanding</li> <li>investigate new and emerging technologies</li> <li>test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups</li> <li>understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists</li> </ul>	<ul style="list-style-type: none"> <li>Developing design ideas</li> <li>Manufacturing specifications</li> <li>Developing a prototype</li> <li>Evaluating prototypes against specifications</li> </ul>	3.3.7 Selection of materials and components  3.2.5 Using and working with materials  3.2.8 Specialist techniques and processes  3.3.7 Selection of materials and components

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<b>crumble</b>	<b>DESIGNING (A)</b> Understanding contexts, users and purposes  <b>DESIGNING (B)</b> Generating, developing, modelling and communicating ideas  <b>EVALUTING (A)</b> Own ideas and products  <b>EVALUATING (B)</b> Existing products  <b>TECHNICAL KNOWLEDGE</b> Making products work	<b>TK 9</b> - how to apply computing and use electronics to embed intelligence in products that respond to inputs <b>TK 10</b> - make use of sensors to detect heat, light, sound and movement such as thermistors and light dependent resistors <b>TK 11</b> - how to apply the concepts of feedback in systems <b>TK 12</b> - how to control outputs such as actuators and motors <b>TK 13</b> - how to use software and hardware to develop programs and transfer these to programmable components for example, microcontrollers <b>TK 14</b> - how to make use of microcontrollers in products they design and manufacture themselves <b>TK 15</b> - how to construct and use simple and compound gear trains to drive mechanical systems from a high revving motor  <b>DA 5</b> - research the health and wellbeing, cultural, religious and socio-economic contexts of their intended users <b>DA 6</b> - understand how to reformulate design problems given to them <b>DA 7</b> - work confidently within a range of relevant domestic, local and industrial contexts, such as the home, health, leisure, culture, engineering, manufacturing, construction, food, energy, agriculture and fashion <b>DA 8</b> - consider the influence of a range of lifestyle factors and consumer choices when designing products <b>DA 9</b> - take creative risks when making design decisions <b>DA 10</b> - consider additional factors such as ergonomics, anthropometrics or dietary needs <b>DA 11</b> - analyse where human values may conflict and compromise has to be achieved  <b>DB 10</b> - produce 3D models to develop and communicate ideas <b>DB 11</b> - use mathematical modelling to indicate likely performance before using physical materials and components, for instance when developing circuits or gearing systems <b>DB 12</b> - give oral and digital presentations and use computer-based tools	Systems design Inputs, processes outputs. Interactivity in products Circuit design. Python – cross curricular with ICT Contexts - analyzing and finding opportunities Taking design risks Meeting the needs and wants of specific users	3.1.5 Mechanical devices  3.1.4 Systems approach to designing  3.3.5 Communication of design ideas  3.3.6 Prototype development
Starpack external competition	<b>MAKING (A)</b> Practical skills and techniques  <b>MAKING (B)</b> Planning for manufacture  <b>DESIGNING (B)</b> Generating, developing, modelling and communicating ideas  <b>EVALUTING (A)</b> Own ideas and products  <b>TECHNICAL KNOWLEDGE</b> Making products work	Live externally set brief e.g. 2023 – “Design a pack to contain three portions of ready to eat fruit and/or vegetables suitable for a young person (11 to 18) to use on the go throughout the day. You should ensure that your design can be reused at least 10 times and that you choose materials that can be recycled once the consumer has finished with it.”  Application of <ul style="list-style-type: none"> <li>• Researching the project</li> <li>• Design ideas</li> <li>• Explanation of choice of materials</li> <li>• Final design with reasoning and evaluation</li> <li>• Producing a functional prototype</li> </ul>	Experience presenting to a national competition.  Materials, their origin, province	3.2 Specialist technical principles  Papers and boards
Serpentine Pavilion project- Architecture modelling and thinking about the physical environment	<b>DESIGNING (A)</b> Understanding contexts, users and purposes  <b>DESIGNING (B)</b> Generating, developing, modelling and communicating ideas  <b>EVALUATING (C)</b> Key events and designers  <b>TECHNICAL KNOWLEDGE</b> Making products work	<b>EC1</b> - about an increasing range of designers, engineers, chefs, technologists and manufacturers and be able to relate their products to their own designing and making	Reflecting and using the work of others to develop design ideas Gathering primary research and data	3.3.1 Investigation, primary and secondary data  3.3.3 The work of others

# Year 9 D&T Curriculum Unit Core Elements

Lesson title/enquiry	Prior knowledge/links to previous years	Core (substantive) factual knowledge/core disciplinary knowledge- what is essential for their understanding/future learning.
1. 2D drawing skills	Students will have presented ideas, covered techniques to avoid design fixation and can draw from a range of primary and secondary inspiration.	Line control Thick line, thin line Crating Compliling shapes Taking risks with form Stock forms
2. 3D drawing skills	Students will have presented ideas, covered techniques to avoid design fixation and can draw from a range of primary and secondary inspiration.	One point perspective Two point perspective Isometric Crating Isosketch
3. 3D drawing skills	Develop and communicate design ideas using annotated sketches. Produce 3D sketches to develop and communicate ideas.	Continuation of isosketch crating tasks SCAMPER technique Rendering
4. Adding detail – alternate views, conveying information and annotation	Develop and communicate design ideas using annotated sketches.	Annotations ACCESSFM Layout and presentation
5. Design Ventura - launch	Analysing contexts Identifying potential target markets Evaluating needs and wants	Introduce the competition, the process and what the students can compete for. The most important thing to do at this stage is understand the various aspects of brief for the year. Students need get into teams of 4-6 and decide who in the team will do what.  Understanding and identifying contexts
6. Design Ventura – Research	Primary and secondary research Carrying out research Analysing and using data to inform design decions and create a specification	Find out more about your audience and the products they like. Research the Design Museum Shop and see what is on sale and who goes to shop there. You can do this on a free visit to the museum or on the shop website.  Now is the time to take a good look at relevant products and consider possible target audiences.
7. Adaptation week	N/A	Use for any lost curriculum time(i.e. finishing units), MAD time, Feedback and assessment. Especially AoL adaptions to minamise and bridge gaps/misconceptions in this units understanding.

# Year 9 D&T Curriculum Unit Core Elements

Lesson title/enquiry	Prior knowledge/links to previous years (including KS2)	Core (substantive) factual knowledge/core disciplinary knowledge- what is essential for their understanding/future learning.
1. Design Ventura – Generating ideas	<p><b>Designing</b>            Identify and solve their own design problems.            Use specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations.            Decide which design criteria clash and determine which should take priority.            Develop and communicate design ideas using annotated sketches.</p>	<p>There are lots of ways to generate ideas – start by thinking of a problem to solve, or perhaps try to come up with lots of initial, quick responses to the brief or go straight into paper modelling. Whichever method you choose to use, the aim is to explore and not to get fixed on the first idea you come up with. This can lead to some unexpected and original solutions to the brief.</p>
2. Design Ventura – Generating ideas	As lesson 1.	<p>Continuation of 1.            Focus on SCAMPER, design fixation avoidance.            analyse the work of past and present professionals and others to develop and broaden their understanding</p>
3. Design Ventura – Modelling & development 1 Iteration feedback and evaluation - 1	<p><b>Experience of manipulating workshop based hand tools and machinery.</b>            Constructing working models and prototypes.            Using hand tools and equipment.            Creating and following manufacture plans.</p>	<p>Students may have more than one design that they feel fits the brief. It's time to select and refine their ideas to develop them further. Test their ideas against the brief, through prototyping and user testing with their chosen audience. Don't forget to consider wider issues such as sustainability. Even if the idea is a good one developing it through questioning, finding flaws, rethinking and refining it, can turn a good idea into a winning one.</p>
4. Design Ventura – Design Ventura – Modelling & development 2 Iteration feedback and evaluation - 2	As lesson 3.	<p>Continuation from 3.            Focus on design iterations, target market feedback, improving idea sand solving problems</p>
5. Design Ventura – Design Ventura – Modelling & development 3 Iteration feedback and evaluation - 3	As lesson 3.	<p>Continuation from 4.            Next iteration.            Focus on design iterations, target market feedback, improving idea sand solving problems</p>
6. Buffer week	N/A	<p>Use for any lost curriculum time(i.e. finishing units), MAD time, Feedback and assessment. Especially AoL adaption to minimise and bridge gaps/misconceptions in this units understanding.</p>

# Year 9 D&T Curriculum Unit Core Elements

Lesson title/enquiry	Prior knowledge/links to previous years (including KS2)	Core (substantive) factual knowledge/core disciplinary knowledge- what is essential for their understanding/future learning.
1. Plan for manufacture	Producing a manufacture specification Highlighting needs and wants	Students will need to fully plan their manufacture including a manufacture plan, manufacture specification and full costings for their proposed idea. Planning a sequenced activity. Including aspects like health and safety and quality control into the plan to achieve better outcomes. Costings of concept Multiplication and division skills, area and working out overheads and costs.
2. Presentation board 1 ,2 & 3	Communication of ideas and concepts. Target audiences Setting out a design brief.	Now a final idea has been developed, start looking at the details that turn a design into a real product – costing your chosen materials and pricing your product. Look at branding, packaging and communicating to your target market. Page one – research Page two – idea and concept generation Page three – concept presentation.
3. Manufacture of prototype	Earlier units and key workshop processes of: Marking out Cutting and shaping Finishing Health and safety Use of quality control measures like jigs and templates.	In Teams the students will produce a high-quality functional prototype to better convey their design idea. This will support the 3 presentation boards. The boards will be continued in lessons 3 and 4 for this half term whilst some of the group work on both the packaging and final concept/product.  Developing a functional prototype using tools and equipment – marking, cutting/forming/shaping, joining and finishing.  Developing a packaging solution- types of packaging, materials to consider, life cycle assessment and impact on the environment
4. Manufacture of prototype	Earlier units and key workshop processes of: Marking out Cutting and shaping Finishing Health and safety Use of quality control measures like jigs and templates.	As Lesson 3.
5. Presentations and choosing our SJT finalist.		Students will present their work in a gallery style presentation then present their concepts as a small group to the rest of the class. One overall winner (group) will be chosen to represent the school and idea submitted to Design Ventura at the design museum

# Year 9 D&T Curriculum Unit Core Elements

Lesson title/enquiry	Prior knowledge/links to previous years (including KS2)	Core (substantive) factual knowledge/core disciplinary knowledge- what is essential for their understanding/future learning.
1. Design for systems	Mechanical and electronic systems What makes a product interactive?	Inputs, process and outputs and associated Components Flowcharts – simplifying complex systems How to use crumble hardware- connectivity via croc clips, input and output pins. Blocks and language. How to download programs onto crumble and test.  Design and testing a program – simple mood light and colour change using a sparkle and switch.
2. Using input and outputs with crumble & Making your system smart! Processing and control with crumble.	Python- blocky BBC microbit	Using control features in crumble: Waits, do until, end if, ifs, counts, loops, hi and low sensitivity.
3. Design context 1 – hygiene  Designing a prototype to improve hygiene in the domestic environment.	Designing for users needs and want Exploring a context Design innovation	Exploring the issue and context. Generating ideas Prototyping the interactivity of the product. Prototyping the housing and material form of product. Generating a design presentation board.
4. Design context 2 – security and safety  Designing a prototype	Designing for users needs and want Exploring a context Design innovation	Exploring the issue and context. Generating ideas Prototyping the interactivity of the product. Prototyping the housing and material form of product. Generating a design presentation board.
Adaptation week	N/A	Use for any lost curriculum time(i.e. finishing units), MAD time, Feedback and assessment. Especially AoL adaption to minimise and bridge gaps/misconceptions in this units understanding.

# Design and Technology – KS4

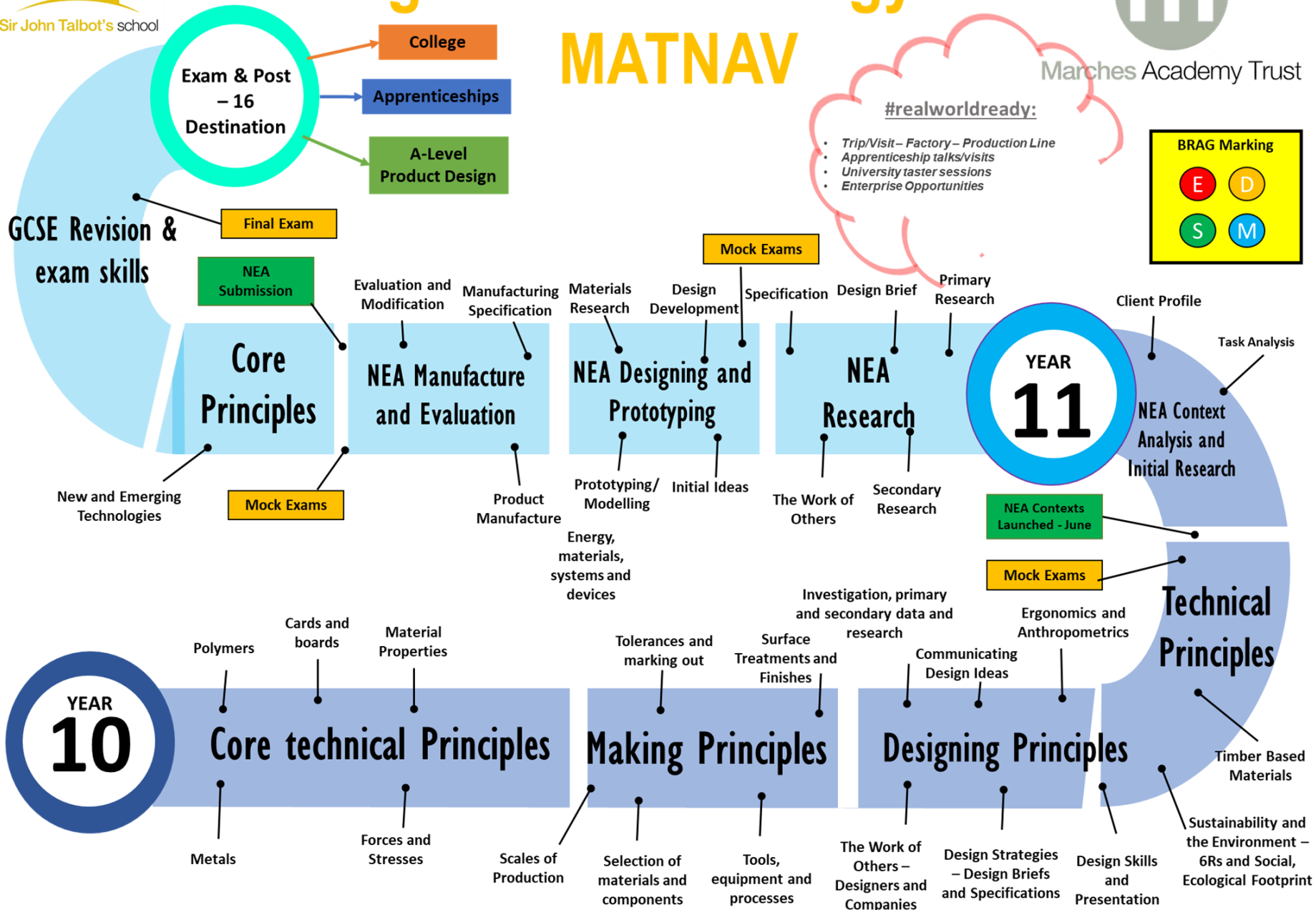


Marches Academy Trust

## MATNAV

#realworldready:

- Trip/Visit – Factory – Production Line
- Apprenticeship talks/visits
- University taster sessions
- Enterprise Opportunities





## The Big Picture

Year Group 10

Developing practical skills, independent working/problem solving and theory knowledge to give an overview of the GCSE course. These will then be fed into how to best complete the NEA in year 11 as well as the written assessment.

## Intent

**Units Covered:** New and Emerging Technologies, Energy, Materials, Systems and Devices, Materials and their working properties, Common Specialist Technical Principles, Timber Based Materials, Designing principles, Making Principles

**Skills covered:** Independence, theory, practical skills and technical knowledge

**Links to previous learning:** Materials, designing and making principles will be built on from KS3. New theory content will be introduced.

## Implementation

The course will consist of 3 lessons a week. 2 will be design/practical based and one theory. There will be more emphasis on theory towards key assessments and mock examinations

LORIC will be referred to throughout the course. With the main focus being organization, resilience and initiative. Communication will be developed in communicating design ideas and through the NEA.

Independence will be developed through creative thinking and encouraging students to take risks in their work. This will in turn build trust in students taking ownership of their work in preparation for the NEA which is vital.

A mixture of homework tasks including examination questions and research tasks will be done. The use of flipped learning will be used when introducing new theory topics to scaffold learning.

Revision booklets have been developed to help with revision of key theory. Using PEE/PETER paragraph are helping with extended writing questions.

How are literacy and numeracy skills to be developed and extended?

### Consider your assessment Markers

**Assessment:** following each unit of theory (half termly)

**Low stakes testing**  
**Deep marking points:** all written and theory work will be deep marked

**Home learning will be set weekly**  
**Conferencing/MAD time during design/practical lessons**

### Autumn Term

Design and Presentation skills  
Design and making principles  
Mini Desk Tidy project  
Timber based materials

### Spring Term

Mock NEA – Feedback given  
**Common materials**  
**Commercial manufacturing**  
**CAD/CAM**

### Summer Term

Mock Examination – revision program  
Commence NEA

## Impact

By the end of year 10 students should be skilled with a variety of theory and practical knowledge to build upon in year 11. This will be implemented greatly in the NEA as well as examinations.

The development of independence, organization and initiative will be implemented throughout year 10 and should be demonstrated throughout the NEA process.

## The Big Picture

Year Group 11

Students will undertake their NEA which accounts for 50% of their overall grade. This will aim to be finished during the Spring term which will then lead into a theory and exam preparation period in the lead up to the exam.

## Intent

**Units covered:** Completion of the NEA and theory knowledge from the AQA specification.

**Skills covered:** Practical application, independence, initiative, organization and time management

**Links to previous learning:** The year 11 year of study builds upon skills and knowledge from year which is applied to the NEA as well as 2 mock examinations. Independent study will mainly be based around theory.

## Implementation

**How will the units within this year of study be organised/structured?**

NEA will be completed during lesson time and will be supplemented with a theory independent study programme in preparation for the examination

**How will you promote LORIC through this year of study?**

LORIC will be promoted through creative thinking and communication of design ideas and concepts.

Students focused a lot on independent working in year 10 and organizing time wisely to maximize lesson time.

Exam technique will be focused on in the lead up to mock exam periods and in the spring term to enable students to be prepared for exams

**Where are the WOW moments and how will you celebrate achievement?**

Encouraging creativity so students can have their own input on designs. Parental contact to celebrate achievement and participation in after school sessions and completion of deadlines will be implemented.

**How are literacy and numeracy skills to be developed and extended?**

Maths questions will be present in the exam so work has been done to liaise with the maths team to try and get some DT questions into maths lessons. This will help students link between subjects.

### Consider your assessment Markers

Due to exam board regulations ongoing assessment of the NEA during its completion is not allowed. However a BRAG Tracking sheet will be used to inform students of completed sections of their NEA.

### Independent study based on theory will be deep marked

**2 / 3 Mock examinations will also be done during year 13.**

Autumn Term  
NEA

Spring Term  
NEA/Revision

Summer Term  
Revision/theory  
sessions

## Impact

What is it that you want students to know/be able to do by the end of this year of study?

**Next steps:** Students who are successful in GCSE Design and Technology have a strong pathway into the A-Level Product Design course which is structured very similarly to the GCSE, especially the NEA.

Students who don't choose to remain studying A-Levels will be suited to a variety of college courses as skills developed on the course can overlap into many field not just STEM courses.

# Design and Technology – KS5



Marches Academy Trust

## MATNAV

#realworldready:

- Trip/Visit – Factory – Production Line
- Apprenticeship talks/visits
- University taster sessions



Sir John Talbot's school

Revision & exam Preparation

Post 18 Destinations

University

Apprenticeships

Final Exams

NEA Submission

Theory Revisited

Analysing and Evaluating

Development of Design Prototype

Development of Design Proposals

YEAR 13

Producing a Design Brief and Specification

Mock Exams

Product Testing

Product Manufacture

Prototyping/Modelling

Initial Ideas

Specification

Design Brief

Accuracy and responsible design

Tools, processes and equipment

Design processes

Technology and Cultural changes

Design Theory

Design and Making Principles

Design methods

Client Interview

Secondary Research

Identifying and Investigating Design Possibilities

Primary Research

Design Communication

Product design and development

Digital design and manufacture

Forming, redistribution and addition processes

Performance Characteristics of materials

Materials and their application

Mock Exams

Mock NEA/Focus practical tasks

Practical Assessments

Regular Feedback

Theory Assessments

Flipped Learning

Independent study

YEAR 12

Core Technical Principles

Baseline Assessment

Testing materials

Enhancement of materials

Material finishes

Modern and Industrial Scales of Practice

Health and Safety

Protecting designs and intellectual property

Design for manufacturing, maintenance, repair and disposal

Enterprise and Marketing

NEA Start – Spring Term

**The Big Picture**

Introduction to A-level Product Design developing skills in key areas in preparation for exam and NEA in year 13. Early focus will be on workshop skills and designing with theory built into each topic.

**Intent**

**Units covered:** Material areas: Wood/timber, polymers, metals and alloys, paper and boards, composite, smart and modern materials, Design presentation, CAD/CAM, Design theory, Ergonomics and Anthropometrics.

**Skills covered:** Practical application, independence, initiative, organization and time management

**Links to previous learning:** Those students who have progressed from GCSE DT will build upon skills developed especially the use of iterative design process.

**Implementation****How will the units within this year of study be organised/structured?**

Units will be shared between the two teachers leading Product Design and will be complimented with independent study tasks and assessments from each area covered.

**How will you promote LORIC through this year of study?**

LORIC will be promoted through a range of media including flipped learning. Organisation of course folder and theory work will be essential and checked regularly. A big focus on independence will be encouraged in year 12 to enable students to flourish with completing the NEA in year 13.

Exam technique will be focused on in the lead up to mock exam periods to enable students to access top marks in questions.

**Where are the WOW moments and how will you celebrate achievement?**

Encouraging creativity so students can have their own input on designs linking to industry and links with universities for workshops will be encouraged.

**How are literacy and numeracy skills to be developed and extended?**

Maths questions will be present in the exam so work will be done to explore exam techniques in answering these questions. LR has liaised with the maths department on questions that may come up in

**Assessment Markers**

**Low stakes assessments** will occur after each theory that is taught and will be recorded.

**Key assessments** will be during the time of mock examinations. All independent study/flipped learning tasks will be **deep marked**

**Home learning** will be weekly and related to the topic that is being covered

**Autumn Term**

Wood/timber, design presentation, metals and alloys, design theory, papers and boards, polymers, smart/modern materials, CAD/CAM, Ergonomics and Anthropometrics

**Spring Term**

Mock NEA, Exam preparation and technique, social, moral and ethical issues, production methods

**Summer Term**

Commencement of the NEA.

**Impact**

Successful completion of year 12 in product design can build a strong foundation to succeed in year 13. The theory knowledge, design skills and practical application can all be applied to the NEA leading to a successful outcome. This can all then be built on and revisited in preparation for the summer examinations in year 13.

**Next steps:** The A-Level Product Design course can lead to a variety of university courses and apprenticeships. The qualification would link to a good range of future STEM careers.

## The Big Picture

Students will undertake their NEA which accounts for 50% of their overall grade. This will aim to be finished during the Spring term which will then lead into a theory and exam preparation period in the lead up to the exam.

Year Group 13

## Intent

**Units covered:** Completion of the NEA and theory knowledge from the AQA specification.

**Skills covered:** Practical application, independence, initiative, organization and time management

**Links to previous learning:** The year 13 year of study builds upon skills and knowledge from year which is applied to the NEA as well as 2 mock examinations. Independent study will mainly be based around theory.

## Implementation

**How will the units within this year of study be organised/structured?**

NEA will be completed during lesson time and will be supplemented with a theory independent study programme in preparation for the examination

**How will you promote LORIC through this year of study?**

LORIC will be promoted through creative thinking and communication of design ideas and concepts.

Students focused a lot on independent working in year 12 and organizing time wisely to maximize lesson time.

Exam technique will be focused on in the lead up to mock exam periods and in the spring term to enable students to be prepared for exams

**Where are the WOW moments and how will you celebrate achievement?**

Encouraging creativity so students can have their own input on designs. Parental contact to celebrate achievement and participation in after school sessions and completion of deadlines will be implemented.

**How are literacy and numeracy skills to be developed and extended?**

Maths questions will be present in the exam so work has been done to liaise with the maths team to try and get some DT questions into maths lessons. This will help students link between subjects.

### Consider your assessment Markers

Due to exam board regulations ongoing assessment of the NEA during its completion is not allowed. However a BRAG Tracking sheet will be used to inform students of completed sections of their NEA.

### Independent study based on theory will be deep marked

**2 / 3 Mock examinations will also be done during year 13.**

Autumn Term  
NEA

Spring Term  
NEA/Revision

Summer Term  
Revision/theory  
sessions

## Impact

What is it that you want students to know/be able to do by the end of this year of study?

**Next steps:** Students who are successful in A-Level Product Design have a strong pathway into a variety of university courses and apprenticeships. The qualification would link to a good range of future STEM careers.