**Design & Technology**

Curriculum Statement



**Intent**

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others’ needs, wants and values.

By using the national curriculum as a progressive model, the aim is cover as broad spectrum of knowledge and skills, to enable pupils to discover their specialism and to take ownership, in order to prepare and progress more independently at GCSE level. Varied creative and practical activities allow pupils gain the knowledge, understanding and skills needed to engage in an iterative process of designing and making covering a range of domestic and local and industrial contexts

Through Design, Make and Evaluate pupils learn to

•Use research and exploration, such as the study of different cultures, to identify and understand user needs

•Identify and solve their own design problems and understand how to reformulate problems given to them

•Use a variety of approaches [for example, biomimicry and user-centred design] to generate creative ideas and avoid stereotypical responses

•Develop and communicate design ideas

•Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture

•Select from and use a wider, more complex range of materials, components, considering their properties

•Evaluate and analyse the work of past and present professionals and others to develop and broaden their understanding

•Investigate new and emerging technologies

•Test, evaluate and refine their ideas and products against a specification, considering the views of intended users and other interested groups

•Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists

•Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions

•Understand how more mechanical systems used in their products enable changes in movement and force.

**Implementation**

Due to the nature of our school pupils often arrive with minimal Design Technology experience and often surprised that they are given the opportunity to use tools and equipment in a workshop setting, with negative experiences in previous education or significant periods out of education resulting in pupils lacking in core skills and confidence. Design and Technology can cover a myriad of topics that can be linked to pupils’ personal interests and offer an array of fun and exciting new experiences instantly engaging the pupils into a creative new positive experience for education.

Using the process of **Design, Make and Evaluate** in all projects the pupils are familiar with the design cycle:

**Design** – Use research and develop design criteria to design for a purpose and communicate their ideas through a range of mediums.

**Make** – Use a wider range of tools and equipment with accuracy and use a wider range of materials and components according to their qualities.

**Evaluate** – Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.

All units of work are designed to enable all students access to learn and to achieve a positive outcome. Students can develop outcomes as part of the unit brief and are free to develop elements of their own as their ability/experiences dictates. Conceptual and contextual Projects use the various elements of an iterative design cycle in order to practise what they know and embed a deeper understanding. Staff will be on hand during lessons, to guide and offer advice to students as their ideas develop within the framework of the unit.

Staff will also be on hand to offer support to pupils and again can offer support through a range of options, such as adapting technological techniques to preparing materials prior to a lesson to promote inclusion.

Art and DT collaborate in an enjoyment only lesson to enhance drawing skills and wherever possible work Is linked to other disciplines such as mathematics, science, engineering, computing and art. This gives the learning purpose and relevance to the children.

In addition, we actively seek to take students out on trips and visits to help them to apply their learning and put it into context in the wider world. Within the local area we attend various design competitions Such as the annual Design Museum live competition which further challenge students to apply the knowledge they have gained in school to real life situations.

**Impact**

Our pupils enjoy the creative self-expression that they experience in Design Technology. They are always keen to learn new skills and work hard to perfect those shown to them, as well as show their knowledge and understanding in maths and science. Pupils achieve well in Design Technology; We still offer the new GCSE in Design Technology which many mainstream schools have dropped due to the amount of content. All pupils that opt to continue at GCSE level achieve at least their expected result but mainly exceed and achieve much higher (2018-2019 mainstream achieved 58% level four and above, we achieved 75%).

Through their design and working in the workshop, the children learn about trust, learn about social, culture and ethnicity in design, practise problem solving, critical thinking and are able to reach out into the community with our Christmas enterprise that operates and sells products to staff and visitors to the school. Pupils are also more prepared for life after school where they have skills and qualifications that will help them into college, into work or even to look after their home with DIY skills.

We use a range of Key Performance Indicators, questioning and quizzes to ensure pupils develop the following:

•Develop the creative, technical and practical expertise needed to perform everyday tasks confidently.

•Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users and critique, evaluate and test their ideas and products and the work of others.

•Evaluate and test their ideas and products and the work of others.

•Pupils are prepared for the next stages of their education and the new changes to the curriculum at GCSE level.

We assess the pupils through:

•Observing children at work.

•Questioning the children in relation to their programme of study in order to assess their understanding and comprehension.

•Assessment/marking the work produced by the children and discussion of their next steps.

•Pupil discussions about their learning, which includes discussion of their thoughts, ideas, processing and evaluations of work.

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| **Year 7** | |  | |  | |  |  | | | | |  | |  | | |  | | |  | | | |  |  | | |
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| Week 1 | Week 2 | | Week 3 | | Week 4 | | | Week 5 | | | Week 6 | | Week 7 | | | Week 8 | | | Week 9 | | | Week 10 | | | | Week 11 | Week 12 | | Remainder of term |
| Baseline Test & Water Project  Initial Assessment.  Intro to workshop safety.  Intro to ‘Design’, ‘Make’ and ‘Evaluate’.  Working to a basic design brief. “Design and Make something that moves on water”.  Pupil Lead  Using Basic Tools  Testing Product  Lots of verbal Assessment for better understanding of new pupils. | | | | | | | | | Plastic Project  DB – Design and make a product from recycling a material.  Using Basic Tools  6R’s  Effects on environment.  Design’, ‘Make’ and ‘Evaluate’.  Knowledge & Core Skills  Using Basic Tools  Joining Materials  Testing Product  Peer & Teacher Assessment | | | | | | Wood & Tools Knowledge  DT Booklet and Machine Usage and Skills Booklet  Knowledge & Core Skills  Sources, Process, Types  Using Basic Tools – Saws, Mallet Vice ETC  Joining Materials – Screws, Glue, Hinges  Peer & Teacher Assessment | | | | | | | | Blockhead Project  Design’, ‘Make’ and ‘Evaluate’  Knowledge & Core Skills  Practical Experience  Using Basic Tools & Equipment – Saws, Mallet, Vice, Sanders ETC  Joining Materials, Glue, Knots  Peer & Teacher Assessment | | | | | | |  |  |  |  |  |  |  |  |  |  |  |
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| Week 1 | Week 2 | | Week 3 | | Week 4 | | | Week 5 | | | Week 7 | | Week 8 | | | Week 9 | | | Week 10 | | | Week 11 | | | | Week 12 | Remainder of term | | |
| Rendering & Iconic Design  Sketching and Rendering skills - textures  Exploring Pop Art and merging with the iconic design of Mini Cooper.  Cardboard Net model. | | | | | | | | | Upcycling Project  Design and make a product out of a redundant or obsolete product.  Design’, ‘Make’ and ‘Evaluate’  Improve and Embed Knowledge & Core Skills  Practical Experience  Using Basic Tools & Equipment – Saws, Mallet, Vice, Sanders ETC  Joining Materials,  Peer & Teacher Assessment | | | | | | | | | Alessi and Design Skills  Explore how other designer’s work.  Design using Alessi inspiration. | | | | | | | Digital Rendering  Krita Software  Using Digital software to improve sketch designs – applying texture, shade, background ETC.  Communicate design ideas. | | | | |
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| Summer |  | |  | |  | | |  | | |  | |  | | |  | | |  | | |  | | | |  |  | | |
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| Puppet Project  Design’, ‘Make’ and ‘Evaluate’  Improve and Embed Knowledge & Core Skills  Practical Experience  Using Basic Tools & Equipment – Saws, Mallet, Vice, Sanders ETC  Joining Materials,  Peer & Teacher Assessment | | | | | | | | | | Streamlining Movement  Explore Streamlining design movement.  Design using streamlining inspiration. | | | | | | | | | | | Concrete Project  Explore alternative modern materials.  Understanding of moulds.  New skills and experience  Using Basic Tools & Equipment – Saws, Mallet, Vice, Sanders ETC  Joining Materials,  Peer & Teacher Assessment | | | | | | | | |

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| **Year 8** | |  | |  | | |  | |  | |  | | |  | |  | |  |  | |  | |  |  |
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| Week 1 | Week 2 | | Week 3 | | | Week 4 | | Week 5 | | Week 6 | | | Week 7 | | Week 8 | | Week 9 | | | Week 10 | Week 11 | Week 12 | | Remainder of term |
| What are Situations & Design Briefs   How to write a response to a design brief   2D design  2D design booklet – learning icons, part design, vectorising ETC  Electronics project  Basic electronic components – battery, LED, capacitor, resistor switch  Using Basic Tools  Make -mini torch.  Testing Product | | | | | | | | | | | | Soldering Project and Acrylic Lamp  Design’, ‘Make’ and ‘Evaluate’  Improve and Embed Knowledge & Core Skills – 2D design, new components PCB  Using Basic Tools & Equipment – soldering irons, multi-meter and applying voltage  Joining Materials, solder  Peer & Teacher Assessment | | | | | | | | | | | | |
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| Spring |  | |  | | |  | |  | |  | | |  | |  | |  | | |  |  |  | |  |
| Week 1 | Week 2 | | Week 3 | | | Week 4 | | Week 5 | | Week 6 | | | Week 7 | | Week 8 | | Week 9 | | | Week 10 | Week 11 | Week 12 | | Remainder of term |
| One point perspective drawing  How to use One point perspective to improve sketches.  Easy 3d Design  Learning box and sculpting 3D design  Making a USB stick housing  3D sculpting an organic shaped product.  3D printing | | | | | | | | | | | | Desk Tidy Project  Existing product and situation analysis  Design’, ‘Make’ and ‘Evaluate’  Embed and practice Knowledge & Core Skills  Practical Experience  Prototype – model and/or CAD  Using Tools & Equipment  Joining Materials,  Peer & Teacher Assessment | | | | | | | | | | | | |
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| Summer |  | |  | | |  | |  | |  | | |  | |  | |  | | |  |  |  | |  |
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| Desk Tidy Continuation     Existing product and situation analysis  Design’, ‘Make’ and ‘Evaluate’  Embed and practice Knowledge & Core Skills  Practical Experience  Prototype – model and/or CAD  Using Tools & Equipment  Joining Materials,  Peer & Teacher Assessment | | | | | Metals – Aluminium Casting  Core knowledge of ferrous and non-ferrous metals.  Masterclass in Aluminium Casting  Design and Make a name plate using sand casting and a mould.  Design’, ‘Make’ and ‘Evaluate’  Embed and Practice Knowledge & Core Skills  Practical Experience – Casting, drafting and furnace skills and knowledge and finishes.  Prototype – model and/or CAD  Using Tools & Equipment  New Materials  Peer & Teacher Assessment | | | | | | | | | | | | | | | | | | | |

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| Year 9 | |  | | |  | | |  | | |  | |  | |  | | |  | | |  |  | |  | |  |  |
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| Week 1 | Week 2 | | Week 3 | | | Week 4 | | | | Week 5 | | Week 6 | | Week 7 | | | Week 8 | | | Week 9 | | | Week 10 | Week 11 | Week 12 | | Remainder of term |
| Smart and New Material Project  Discover and use Smart and Modern materials.  Use Smart and Modern materials. as inspiration for innovative design.  Image new and exciting ideas for futuristic products or evolution of existing products using Smart and new materials.  Learning of basic crumble programming.  Embed and practice Knowledge & Core Skills  Practical Experience  Prototyping – model making and CAD  Using Tools & Equipment  Joining Materials,  Peer & Teacher Assessment | | | | | | | 3D Lego Man Project  Learning parametric 3D design  Modelling an existing product.  3D printing  Embed and practice Knowledge & Core Skills | | | | | | | | | | | | Design Ventura Competition  Competing in live national design competition.  Teamwork project competing against other schools  Reaction and response to design brief  Existing product and situation analysis  Design’, ‘Make’ and ‘Evaluate’  Embed and practice Knowledge & Core Skills  Practical Experience  Prototyping – model making and CAD  Using Tools & Equipment  Joining Materials,  Peer & Teacher Assessment  Entrepreneurial Skills | | | | | | | | |
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| Spring |  | |  | | |  | | | |  | |  | |  | | |  | | |  | | |  |  |  | |  |
| Week 1 | Week 2 | | Week 3 | | | Week 4 | | | | Week 5 | | Week 6 | | Week 7 | | | Week 8 | | | Week 9 | | | Week 10 | Week 11 | Week 12 | | Remainder of term |
| Design Ventura Competition  Competing in live national design competition.  Teamwork project competing against other schools.  Reaction and response to design brief  Existing product and situation analysis  Design’, ‘Make’ and ‘Evaluate’  Embed and practice Knowledge & Core Skills  Practical Experience  Prototyping – model and CAD  Using Tools & Equipment  Joining Materials,  Peer & Teacher Assessment  Entrepreneurial Skills | | | | Product Design  Evolution  Know how to evaluate products. Understand how and why they have changed over time.  Develop an understanding about the relationship between evolution and design. | | | | | Biomimicry Project  Understand what biomimicry is and how it is affecting design.  Use biomimicry as inspiration for innovative design.  Prototyping – model making and CAD | | | | | | | Prototyping Master Class sessions & Lamination Lamp Project  Discover and practise Designers Ray and Charles Eames lamination techniques  Use. Ray and Charles Eames designs as inspiration for innovative design.  new materials - veneer.  Embed and practice Knowledge & Core Skills  Practical Experience – using molds and templates  Prototyping – model making and CAD  Using Tools & Equipment – Scalpels, strapping  Joining Materials,  Making a quality product  Peer & Teacher Assessment | | | | | | | | | | | |
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| Summer |  | |  | | |  | | | |  | |  | |  | | |  | | |  | | |  |  |  | |  |
| Week 1 | Week 2 | | Week 3 | | | Week 4 | | | | Week 5 | | Week 6 | | Week 7 | | | Week 8 | | | Week 9 | | | Week 10 | Week 11 | Week 12 | | Remainder of term |
| Plans and Elevations.  Know the properties of special quadrilaterals and other polygons.  Know what a plan and elevation is  Able to draw the plan and elevations for a 3D image  How to use plans and elevations to improve sketches and communicate ideas. | | | | | | | Remote Control Design Project  Understand why ergonomic and anthropometric data is and how it is affecting design.  Use human centred design as inspiration for innovative design.  Prototyping – model making foam and CAD  new materials – modelling foam and wire cutter.  Peer & Teacher Assessment | | | | | | | | | | | | Drone Project  Competing against peers.  Teamwork project competing against others in group  Existing product and situation analysis  Design’, ‘Make’ and ‘Evaluate’  Embed and practice Knowledge & Core Skills  3D design  3D printing  Using Tools & Equipment  New components – remote control receivers, motor, sensors, audio-visual systems.  Embed and practice  Practical Experience  Prototyping – model making and CAD  Using Tools & Equipment  Peer & Teacher Assessment  Entrepreneurial Skills | | | | | | | | |

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| **Year 10** | |  | |  | | |  | |  | |  | |  | | |  | |  |  | |  | | |  |  |
| Autumn |  | |  | |  | | |  | |  | |  | | |  | |  | | |  |  | |  | |  |
| Week 1 | Week 2 | | Week 3 | | Week 4 | | | Week 5 | | Week 6 | | Week 7 | | | Week 8 | | Week 9 | | | Week 10 | Week 11 | | Week 12 | | Remainder of term |
| OCR GCSE 9-1  Exploring the context of a design solution  Social, cultural, moral and economic considerations  Usability when designing prototypes  Inclusive design  Aesthetic cosiderations  Design’, ‘Make’ and ‘Evaluate’  Knowledge & Core Skills  Practical Experience  Using Tools & Equipment  Prototyping – model making and CAD  Peer & Teacher Assessment | | | | | | Learning from existing products & Practise   Exploring and Critiquing existing designs.  Fashion & Trends  Marketing & Branding  Impact on Society  Planned Obsolescence  Emerging technologies  Design’, ‘Make’ and ‘Evaluate’  Knowledge & Core Skills  Practical Experience  Using Tools & Equipment  Prototyping – model making and CAD  Peer & Teacher Assessment | | | | | | | | Implications of Wider issues.  To know and understand the impact of New and emerging technologies when developing design solutions within different context.  Industry and Enterprise  Circular and linear economy  Lifestyle, culture and society  sustainability in design  Design’, ‘Make’ and ‘Evaluate’  Knowledge & Core Skills  Practical Experience  Using Tools & Equipment  Prototyping – model making and CAD  Peer & Teacher Assessment | | | | | | | | Design thinking and communication   2D & 3D sketching  Graphical techniques  Perspective Drawing  Isometric drawing  Sketch modelling  Exploded Drawing  Design’, ‘Make’ and ‘Evaluate’  Knowledge & Core Skills  Practical Experience  Using Tools & Equipment  Prototyping – model making and CAD  Peer & Teacher Assessment | | | |
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| Spring |  | |  | |  | | |  | |  | |  | | |  | |  | | |  |  | |  | |  |
| Week 1 | Week 2 | | Week 3 | | Week 4 | | | Week 5 | | Week 6 | | Week 7 | | | Week 8 | | Week 9 | | | Week 10 | Week 11 | | Week 12 | | Remainder of term |
| Material Considerations  Categories of materials  Prototyping materials  Woods – natural and man-made  Ferrous, Non Ferrous metals and alloys  Thermo & Thermosetting polymers  Textiles fibres and fabrics  Modern and Smart materials  Composite materials  Characteristics properties of materials | | | | | | Mechanical device in electronics  Controlled movements  Types of motion  Forces  Electronic systems  Embedding programmes  Sensors, switches and devices | | | | | | | | Making iterative models  Processes and techniques  Finishes  Paper and card  Laminating  Digital design tools | | | | | | | | Manufacturing methods and scales of production  One off, batch mass production  Types of printing  Vinyl cutting and Die cutting  Cost and Availabilty | | | |
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| Summer |  | |  | |  | | |  | |  | |  | | |  | |  | | |  |  | |  | |  |
| Week 1 | Week 2 | | Week 3 | | Week 4 | | | Week 5 | | Week 6 | | Week 7 | | | Week 8 | | Week 9 | | | Week 10 | Week 11 | | Week 12 | | Remainder of term |
| Timber Specialist Knowledge  Soft and hard woods  Manufactured Boards  Sources  Eco materials  Fixings  Manipulating and Joining  Structural Integrity  Iterative Models  Processes  Finishes  Incorporating digital design  Costing | | | | | | Metal Specialist Knowledge  Physical and working properties  Ferrous & Non Ferrous metals   Sources and Origins  Ecological, social and ethical issues  Lifecycle and recycling of materials  Common forms  Fixings  Manipulating and Joining  Structural Integrity  Iterative Models  Processes  Finishes  Incorporating digital design  Costing | | | | | | | | Polymer Specialist Knowledge  Physical and working properties  Common thermo-polymers and thermosetting polymers  Sources and Origins  Ecological, social and ethical issues  Lifecycle and recycling of materials  Common forms  Fixings  Manipulating and Joining  Structural Integrity  Iterative Models  Processes  3D printing  Finishes  Incorporating digital design  Costing | | | | | | | | Design Engineering  Working with mechanical components  Class of lever  Mechanical systems  Types of gears and cams  Working with electronic components.  Flow Charts  Sensos  Motors  Choosing the right microcontroller  Iterative Models  Processes  3D printing  Finishes  Incorporating digital design  Costing | | | |

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| **Year 11** | |  | |  | | |  | |  | |  | |  | |  | |  |  | | |  | |  |  | |
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| Week 1 | Week 2 | | Week 3 | | | Week 4 | | Week 5 | | Week 6 | | Week 7 | | Week 8 | | Week 9 | | | | Week 10 | Week 11 | Week 12 | | Remainder of term | |
| Non- Exam Assessment Iterative Design Challenge  Introduction  Exemplar of previous contextual challenge  What evidence will I need | | | | | Non- Exam Assessment Iterative Design Challenge  Pupils work independently to complete challenge. | | | | | | | | | | | | | | | | | | | | |
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| Spring |  | |  | | |  | |  | |  | |  | |  | |  | | | |  |  |  | |  | |
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| Non- Exam Assessment Iterative Design Challenge  Pupils work independently to complete challenge. | | | | | | | | | | | | | | | | | | | GCSE Exam Prep  Revision and recap of core knowledge  Exam sample questions | | | | | | |
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| Summer |  | |  | | |  | |  | |  | |  | |  | |  | | | |  |  |  | |  | |
| Week 1 | Week 2 | | Week 3 | | | Week 4 | | Week 5 | | Week 6 | |  | |  | |
| GCSE Revision and Recap  Revision and recap of core knowledge  Exam sample questions | | | | | | | | | | | | | | | |

