# Key Stage 3 Curriculum Map: Design and Technology

| | All year 7 start the year in the drawing skills project. The remainder of the year is then split into 3 different rotations. The 3 different areas are: DT (Blockbots), DT (Monster Wrap) and Food Preparation and Nutrition. Each rotation topic has 2 assessment points and 2 structured homework tasks. | | | |
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| | **Key Drawing and Communication Skill Development** | **Materials: Blockbots** | **CAD CAM: Monster Wrap** | **Food Preparation and Nutrition** |
| **Year 7** | Students will develop foundational drawing and presentation skills to effectively communicate their design ideas. They will practise shading, rendering, and drawing both isometric and orthographic projections, building confidence in visual representation and technical accuracy.<br><br>Topics and skills covered:<br>• Shade, tone, and rendering techniques<br>• Isometric drawing for 3D visualisation<br>• Orthographic drawing for technical detail<br>• Presentation and annotation of ideas<br>• Self and peer review of visual work<br><br>Assessment for this unit will mainly consist of peer and self-assessment, with a final teacher assessed task that looks to show progression in all of the skill areas covered in the unit. | Students will practise and develop skill in working with wood to create their own 'block head' toy. They will learn workshop safety and use hand tools and machinery to measure, cut, shape, and finish timber, applying knowledge of wood properties and lamination.<br><br>Topics and skills covered:<br>• Workshop health and safety<br>• Marking out and accurate measuring<br>• Use of hand saws, files, and pillar drills<br>• Laminating wood for strength<br>• Understanding different timber types<br>• Developing a design specification and generating ideas<br>• Maths links: unit conversion, area, measurement accuracy<br><br>Students will be assessed on their ability to:<br>• Generate design ideas that meet a clear specification<br>• Accurately mark out and safely use hand tools and machines<br>• Produce a well-finished wooden product with attention to detail<br>• Reflect on their making process, discussing successes and improvements<br><br>The key assessment points for this unit are Design and Make. All other marking in this unit will be a mixture of peer and self-assessment. | Students will explore 2D and 3D CAD skills to design an earphone wrap. They will apply CAD tools to create laser-cut components and 3D print parts, developing an understanding of digital design and manufacturing technologies.<br><br>Topics and skills covered:<br>• Task analysis and specification writing<br>• 2D CAD design for laser cutting<br>• Introduction to 3D modelling with Autodesk Inventor<br>• Practical use of laser cutter and 3D printer<br>• Understanding advantages and limitations of CAD/CAM<br>• Maths links: unit conversion, measurement, area, radius, diameter<br><br>Students will be assessed on their ability to:<br>• Develop and present design ideas using 2D and 3D CAD software<br>• Produce precise digital files ready for CAM manufacture<br>• Use laser cutting to create functional prototypes<br>• Evaluate their design and manufacturing process, suggesting improvements<br><br>The key assessment points for this unit are Design and Evaluate. All other marking in this unit will be a mixture of peer and self-assessment. | Students will learn about the three areas of kitchen hygiene; Personal, Kitchen and Food. They will learn about how to be safe when working independently, focusing particularly on safe knife skills, how to use kitchen equipment without injury and where to store food to prevent cross-contamination.<br>They will look at the importance of a healthy and varied diet as depicted in the Eatwell guide and learn about the sources of Macronutrients and Micronutrients and the importance of knowing why they are needed in the body. Students will also learn that foods provide energy in different amounts and how reading a food label can inform consumer choice.<br>**Within the kitchen classroom as well as learning about health and safety; particularly safe knife skills, how to use the kitchen equipment safely and the importance of following strict hygiene procedures they will also learn the importance of following a recipe to achieve a successful outcome, the different effects that different cooking methods can have on the sensory properties of food and how to adapt a simple recipe.**<br>**They will make Guacamole and Crudités, Pizza Bagels, Red Lentil and Sweet Potato curry, Sweet and Sour chicken and then adapt a breakfast muffin.**<br><br>**Food science will include how the different methods of heat transfer can affect the sensory properties of food.**<br><br>The key assessment point for this unit will be an assessed practical (Make) towards the end of each rotation. All other marking in this unit will be a mixture of peer and self-assessment and homework feedback. |
| | Assessment: | Assessment Points:<br>Design/Develop and Make | Assessment Points:<br>Design/Develop and Evaluate | Assessment Points:<br>Make |

# Key Stage 3 Curriculum Map: Design and Technology

| Year 8 | The year is split into 3 different rotations. The 3 different areas that the pupils will rotate through are: DT (Mood Light), DT (Pewter Casting) and Food Preparation and Nutrition. Each rotation topic has 2 assessment points and 2 structured homework tasks. | | |
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| | **Biomimicry Mood light** | **Metal Casting & Digital Design** | **Food Preparation and Nutrition** |
| | Students will explore biomimicry principles to inspire their design of a functional night light, integrating natural forms and sustainable thinking. They will develop practical skills in the workshop and CAD, combining hand-tool woodworking to create a wooden base with 2D CAD design and laser cutting for decorative elements. Programming skills will be developed through coding a BBC Micro:Bit to control the light.<br><br>Topics and skills covered:<br>• Task analysis and design specification development<br>• Biomimicry in design and natural form inspiration<br>• 2D CAD for laser cutting<br>• Orthographic and technical drawing skills<br>• Microcontroller programming (BBC Micro:Bit)<br>• Hand tool skills for cutting, shaping, and joining wood<br>• Wood joining techniques<br>• Maths in design: unit conversion, precise marking out, tolerances, surface area, and volume calculations<br><br>Students will be assessed on their ability to design and make a biomimicry-inspired mood light that meets a technical specification, demonstrating:<br>• Generation of a range of creative design ideas inspired by natural forms and biomimicry principles<br>• Production of detailed and accurate working drawings (orthographic and/or isometric) to guide manufacture. Skillful use of CAD and CAM to produce accurate components<br>• Quality of handcrafted wooden base including accurate joints and finishes<br><br>The key assessment points for this unit are Design and Make. All other marking in this unit will be mixture of peer and self-assessment. | Students will investigate traditional metal casting processes alongside modern CAD/CAM techniques, designing and producing a small, personalised pewter item such as a keychain, pendant, or badge. This project encourages exploration of metal properties, craftsmanship, and design inspiration from professional designers. Students will develop their understanding of manufacturing workflows and quality control.<br><br>Topics and skills covered:<br>• Task analysis and user profile development<br>• Research into professional designers and design influences<br>• Specification writing for metal products<br>• 2D CAD and CAM for mould making<br>• Pewter casting process and safety procedures<br>• Metal finishing techniques including filing, enamelling, and polishing<br>• Maths in manufacturing: unit conversion, volume and material estimation, tolerances, and waste minimisation<br><br>Students will be assessed on their ability to investigate and produce a high-quality pewter product that meets a user profile and specification, demonstrating:<br>• Insightful research into designers and user needs<br>• Well-developed and realistic design proposals using CAD<br>• Competent use of casting and metal finishing techniques<br>• Attention to quality and finish of final product<br>• Clear evaluation of the manufacturing process, including challenges and improvements<br><br>The key assessment points for this unit are Investigate and Design/Develop. All other marking in this unit will be mixture of peer and self-assessment. | Students will develop an understanding of how the correct storage of food contributes to preventing food poisoning and bacteria multiplication. Students will know the importance of hydration. They will know where their food comes from and how it gets from farm to fork. They will look at foods from around the world and be introduced to a diverse range of ingredients. They will learn about a variety of environmental factors that affect people's choice of food such as seasonality and food waste and learn how availability of food changes depending on where in the world someone lives. They will investigate the ingredients in bread making, particularly how yeast works to help raise a bread product and then develop all this knowledge to design and make their own bread product.<br>**Within the kitchen classroom, students will learn how to follow a recipe that has two elements (e.g. spaghetti Bolognese), demonstrate more complex knife skills, and know how to prevent food poisoning and bacteria multiplication.**<br><br>**They will make Savoury rice, Vegetable stir fry, Chilli con carne, Spaghetti Bolognese, bread and design and make a multicultural bread product.**<br><br>**Food Science will include how fermentation helps to raise a bread product.**<br><br>The key assessment point for this unit will be an assessed practical (Make) towards the end of each rotation. All other marking in this unit will be a mixture of peer and self-assessment and homework feedback. |
| | Assessment Points:<br>Design/Develop and Make | Assessment Points:<br>Design/Develop and Investigate | Assessment Points:<br>Make |

# Key Stage 3 Curriculum Map: Design and Technology

| Year 9 | The year is split into 3 different rotations. The 3 different areas are: DT (Marble Run Challenge), DT (Sustainability Project) and Food Preparation and Nutrition. Each rotation topic has 2 assessment points and 2 structured homework tasks. | | |
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| | **STEM: Card Engineering Marble Run Challenge** | **Design and Innovation: Design for a sustainable future** | **Food Preparation and Nutrition** |
| | Students work in small design teams to engineer a functional marble run structure using card, applying principles of physics and mechanisms. The brief challenges students to incorporate at least two mechanical systems (from cams, levers, pulleys, gears) and ensure a controlled descent that takes approximately 1 minute – building in iterative design, real-world testing, and maths application.<br><br>Topics and skills covered are:<br>• Mechanical systems (cams, gears, pulleys, levers)<br>• Forces and motion (gravity, friction, resistance)<br>• Material testing (properties of paper and card)<br>• Team-based iterative development (plan–test–modify cycles)<br>• Engineering drawing (isometric/orthographic)<br>• Velocity ratio and simple calculations<br>• Evaluating performance against time-based and system-based criteria<br><br>Students will be assessed on their ability to collaboratively design and engineer a functional marble run that meets the project criteria. The assessment will emphasise:<br>• Effective application of mechanical systems (cams, gears, pulleys, levers) integrated into the design<br>• Demonstration of understanding forces and motion principles through practical testing and refinement<br>• Use of iterative design cycles, showing clear evidence of planning, testing, evaluation, and modification to improve performance<br>• Accuracy and clarity in engineering drawings<br>• Critical evaluation of their final product<br><br>The key assessment points for this unit are Design and Evaluate. All other marking in this unit will be mixture of peer and self-assessment. | Students will respond to an architectural brief with a creative solution that reflects sustainable thinking and modern design. They will explore the 6 Rs, user needs, and the wider societal impact of design decisions. Through iterative modelling and digital prototyping (CAD/CAM), students will develop, test, and present their ideas using both traditional and digital methods.<br><br>Topics and skills covered are:<br>• Design for sustainability (6 Rs, lifecycle thinking)<br>• User-centred design (empathy, client profiles)<br>• Sketching and iterative development<br>• Physical modelling using card and plastics<br>• Introduction to 3D CAD tools<br>• CAM processes: laser cutting, 3D printing<br>• Use of thermoplastics and heat forming<br>• Maths in design: tessellation, scale, surface area<br><br>Students will be assessed on their ability to *develop a design solution* that thoughtfully integrates sustainable principles and meets the needs of a specified user. The assessment will focus on:<br>• The quality and creativity of design ideas demonstrated through sketches, physical models, and CAD prototypes<br>• The iterative development process, showing how feedback and testing have refined the design<br>• Effective use of both traditional modelling techniques and digital CAM processes to realise a prototype or detailed model<br>• Clear communication of ideas through annotated design work and presentations<br><br>The key assessment points for this unit are Design and Make. All other marking in this unit will be mixture of peer and self-assessment. | Students will look at the many factors that can affect the choice of food. This will include diet related health problems, allergies and intolerances, ethical and moral considerations and religious and cultural choices. They will begin to understand how their food is processed and the difference between making foods from scratch and buying readymade components or convenience foods. They will understand the importance of costing and adapting recipes to suit a specific dietary need. Building on the knowledge they've learnt in year 7 and 8 about the principles of nutrition and sourcing of ingredients, they will apply their knowledge to adapt existing recipes to suit these needs.<br><br>**Within the kitchen classroom students will incorporate more complex cooking skills within a meal such as pasta and dough making. They will also consolidate how the storage of food contributes to preventing food poisoning and bacteria multiplication.**<br><br>**Food science will include the dextrinisation of a bread product and how raising agents work.**<br><br>The key assessment point for this unit will be an assessed practical (Make) towards the end of the rotation. All other marking in this unit will be a mixture of peer and self-assessment and homework feedback. |
| | Assessment Points:<br>Design/Develop and Evaluate | Assessment Points:<br>Design/Develop and Make | Assessment Points:<br>Make |