Buckler's Mead Academy

Curriculum Booklet: Design and Technology

Midsomer Norton Schools Partnership

Design and Technology Curriculum Intent

The Design and Technology curriculum at Buckler's Mead aims to inspire, engage and enthuse by designing and making products that solve real and relevant problems, allowing students to learn iteratively using up to date technologies and processes, ensuring success for all by raising all students' aspirations to prepare them for career pathways suited to the 21st century.

We provide high quality design and technology education that encourages creativity and educates our students in essential knowledge of social, moral, sustainable, environmental and cultural issues along with basic life skills; we are a significant contributor in equipping our students with skills to be healthy, independent and capable, with empathy for the world and environment around us.

We actively promote STEM careers by exposing them to many career related pathways and to give them a sense of purpose as to the knowledge that they are being taught. At Buckler's Mead Academy we have high expectations of all children, including those with SEND, to follow the Design and Technology National Curriculum in full up to the end of Year 9. Design and Technology also lends itself to raising attainment and a sense of achievement for those students that typically find more traditional academic subjects harder to access; by naturally unpacking the learning by making more use of visual aids and prompts, physical aids, exemplary work and instruction aids. Students build confidence to take this subject further at KS4 and typically go on to make high levels of progress compared to their prior KS2 attainment. The subject has strong links with local industry, raising awareness of careers in design, engineering, business and other STEM related pathways and empowering our students to be confident to achieve their ambitions, without prejudice, based on their talents and interests.

We encourage our pupils to become 'designers of tomorrow'. We seek to ensure all of our pupils are well equipped with powerful knowledge that they will require during their life in the 21st century and an ever increasing technological world. By studying design and technology, pupils are given the opportunity to explore the world, understand humanity, to gain global knowledge and a glimpse into history. Just like professional designers, pupils are encouraged to undertake an innovative and iterative approach to their outcomes, to be adaptable and to take creative risk. We are seeking to develop critical thinkers who build confidence to solve problems and who are not afraid to reflect, seek constructive feedback or ask questions to further their development. To be successful in design and technology, attention to detail is vital and pupils will be expected to create high quality outcomes which are precise and accurate at all times, demonstrating the importance of good presentation and taking pride in one's work.

We have 'Golden Threads' running throughout the curriculum, which encompasses the core values of the subject and will stand our students in good stead for their future lives as a consumer, but above all, as a moral member of our society. These threads which are developed and built upon over the three years within KS3 include: Health & Safety, Sustainability and Ethics, Principles of Design, Drawing Skills, Computer Aided Design and Manufacture (CAD/CAM) and Materiology.

Upon completion of their design and technology course here at Buckler's Mead Academy, our students will have a greater sense of being human. We hope that they understand the philosophies of user-centred design and user-experience design and are able to talk confidently to other humans to understand their needs and wants. Our students should be able to respond to this and to resolve problems. They should be able to think critically within different contexts and participate in solution-focussed discourse.

As a consumer, students should understand the human footprint on the world and be able to make educated choices. They should be able to consider dilemmas from a moral and ethical viewpoint. They should be able to sketch ideas creatively, using a number of different angles and perspectives. They should be able to draw to scale and create with precision and accuracy. They should understand the purpose of quality control and be able to recognise this, both within their own work and that of others. They should be able to justify their decisions and articulate their thoughts with confidence, defending that which they firmly believe in. They should be able to work collaboratively with others, to be flexible in team building situations and to be able to take the lead when necessary to ensure the job gets done. Finally, they should be able to manage their time effectively and work to deadlines sufficiently. They should be able to listen to feedback and to act upon this feedback objectively.

Key Stage 3 Curriculum

Buckler's Mead Academy has based KS3 Design and Technology on the National Curriculum and has divided it into four strands to improve student and parent understanding of related curriculum pathways at KS4. Using the National Curriculum's KS3 Design and Technology and the Principles of Study and guidance and training from the Design and Technology Association, our curriculum is based on a five-year generative programme, where knowledge and skills are introduced and built on from Year 7 to Y11 so that students are confident in the broad range of materials and processes needed for GCSE Design and Technology.

In KS3, students study four Design and Technology lessons a fortnight. In Year 7, Year 8 and year 9 this enables students to experience approximately 7 weeks of lessons, on rotation, in each of the following:

- Textiles
- Product Design
- Food and Nutrition

A significant number of our students arrive at Buckler's Mead Academy with limited or no prior KS2 experience in Design and Technology and limited experience of the technical equipment and facilities available at our school, therefore the first unit in Year 7 for each of the specialisms focuses on health and safety in the respective area.

Year 7 Programme of Study

Rotation	Curriculum Foci
1	**Art Textiles (A Bag for Life)** ● Understand about textile fibre sources e.g. natural and synthetic and fabrics, plain and woven. ● Know how to set up and control the sewing machine. ● Know how to construct a seam, construct a bag for life and how to insert handles onto a bag ● Know how to use sublimation printing and hand embroidery as a method of adding surface decoration ● Develop and communicate design ideas using annotated sketches
2	**Food and Nutrition (Cooking nutrition and healthy lifestyles)** ● Applying health and safety when working in the kitchen ● Understanding the importance of healthy eating and nutrition to health ● Developing basic kitchen skills: peeling, chopping, rubbing in and presentation ● Evaluating food products using sensory descriptors and star profile
3	**Product Design (Upcycling)** ● Understanding where materials come from. ● Know about sustainability and renewable materials ● Understand how to design for a target market. ● Health and Safety in the workshop ● Working with wood to make high quality products using a range of tools and processes. ● Develop skills in designing and evaluating design ideas"

Year 8 Programme of Study

Term	Curriculum Foci
1	**Art Textiles (Sew to Bed)** ● Understand how to select and modify patterns and use in textile construction, understand pattern markings; notches, straight of grain etc. ● Understand how to independently follow instructions to produce a wearable product. Know how to independently set up and control the sewing machine. ● Know how to construct a waistband and hems. Know how to use Applique as a surface decoration technique. ● Evaluate the work of others through a product analysis. ● Develop and communicate design ideas using annotated sketches.
2	**Food and Nutrition (Special Diets)** ● Applying health, safety and food hygiene when working in the kitchen ● Identify the different types of special diets, reasons for following and understanding their impact on organoleptic qualities and health ● Understand and be able to adapt a recipe to meet the needs of an individual who has a specific dietary requirement ● Further developing your practical kitchen skills (building from year 7) ● Analysing food products using sensory descriptor words, completing a star profile and writing an evaluation.
3	**Product Design (Working with Metals)** ● Understand how to identify different metals and their properties ● Understand how to work with metal ● Know how to cast metal using pewter ● Know how to add an enamel finish to copper

Year 9 Programme of Study

Term	Curriculum Foci
1	**Art Textiles** ● Understand the impact that the fashion and textiles industry has on the environment. ● Know the 6R'S of sustainability and how they can help reduce the impact on the environment. ● Work with a range of textiles materials to produce a decorative fabric. ● Know how to independently set up and control the sewing machine. ● Explore a range of decorative embroidery including hand and machine embroidery. ● Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups. ● Understand how to produce a range of samples using decorative techniques: stitch and slash, sublimation printing, reverse applique, hand embroidery, beading. ● Analyse the work of other textiles artists to gather inspiration for their own design. ● Develop and communicate design ideas using annotated sketches
2	**Food and Nutrition (Sustainability)** ● Applying health, safety and food hygiene when working in the kitchen ● Identify and understand the big challenges facing our food industry ● Identify and understand how to take practical action to become more sustainable ● Further developing your practical kitchen skills ● Analysing food products using sensory descriptors words, completing a star profile and writing an evaluation Food and Nutrition ● Understand the importance of good nutrition ● Understand specific nutritional requirements of specific groups ● Understand health implications if nutritional needs are not met ● Develop your preparation, knife and cooking skills by cooking a range of challenging dishes (linking to H&C preparation, knife, cooking and preparation skills) ● Adapt recipe dishes to meet the needs of a specific group ● Plan a recipe that is more considerate to the needs of a specific group ● Evaluate recipe dishes using sensory descriptors, completing a star profile
3	**Product Design** ● Understanding different production methods ● Understanding the impact of AI of product design and manufacture ● Developing skills in CAD/CAM ● Laminating timber to create curves ● Working with wood to make high quality products using a range of tools and processes. ● Understanding how production aids are used in batch production". ● Creating production schedules and flow charts ● Carrying out non stereotypical design ● Creating high quality products making use of CAD/CAD as required ● Understanding Systems and control ● Understanding how intelligent electronics are used ● Understanding sensors, feedback systems, actuators, motors and microcontrollers ● Understanding new and emerging technologies

Key Stage 4

Year 10 Curriculum Plan - Hospitality and Catering (WJEC)

WJEC Level 1/2 Vocational Awards (Technical Awards) provide learners with opportunities to study vocational subjects alongside GCSEs and other general and vocational qualifications as part of a broad programme of study. This course focuses on applied learning, i.e. acquiring and applying knowledge, skills and understanding through purposeful tasks set in sector or subject contexts that have many of the characteristics of real work. This award in Hospitality and Catering has been designed to support learners in schools and colleges who want to learn about this vocational sector and the potential it can offer them for their careers or further study. It is most suitable as a foundation for further study. This further study would provide learners with the opportunity to develop a range of specialist and general skills that would support their progression to employment. Hospitality and catering is a dynamic, vibrant and innovative sector delivering vital jobs, growth and investment in the heart of our local communities - important culturally, socially and economically.

Term	Curriculum Foci
1	**Unit 1 - The Hospitality and Catering Industry Students study and understand hospitality and catering provision (1.1)** **Learning tasks:** ● Know the different types of hospitality and catering providers ● Understand working in the hospitality and catering industry ● Understand working conditions in the hospitality and catering industry ● Understand the factors that contribute to the success of hospitality and catering provision ● Developing practical cooking skills and presentation (Unit 2 – Hospitality and Catering in Action)
2	**Unit 1 – The Hospitality and Catering Industry Students study and understand how hospitality and catering provisions operate** **(1.2) Learning tasks:** ● Understand the operation of front and back of house ● Understand how the industry meets customer requirements ● Understand how hospitality and catering provision meets specific requirements, e.g. customer requirements, expectations and customer demographics Health and safety and in hospitality catering (**1.3) Learning tasks:** ● Understand health and safety in hospitality and catering provision ● Know and understand the importance of food safety ● Developing practical cooking skills and presentation (Unit 2 – Hospitality and Catering in Action)
3	**Unit 1 – The Hospitality and Catering Industry Students study and understand food safety in hospitality and catering.** **(1.4) Learning tasks:** ● Know food related causes of ill health ● Know and understand symptoms and signs of food induced ill health ● Know and understand preventative control measures to prevent food induced ill health ● Know and understand the role of the Environmental Health Officer

4	**Unit 2 – Hospitality and Catering in Action Students study and understand the importance of nutrition. (2.1)** ● Know and understand the importance of nutrition ● Know and understand how cooking methods can impact on nutritional value ● Developing practical cooking skills and presentation (Unit 2 – Hospitality and Catering in Action)
5.	**Unit 2 – Hospitality and Catering in Action Students study and understand the importance of menu planning. (2.2)** ● Understand factors affecting menu planning, e.g. cost, portion control etc. ● Know how to plan production ● Developing practical cooking skills and presentation (Unit 2 – Hospitality and Catering in Action)
6.	**Unit 2 – Hospitality and Catering in Action Students will take part in a mock synoptic project** A synoptic project is based around a brief issued from the exam board and has set criteria that students need to complete, including a practical assessment. Students will apply their knowledge gained over the course to the brief (theory tasks 1, 2 & 4) and carry out a practical (task 3) where students must demonstrate their knowledge of health and safety, food safety and their practical skills (preparation, knife, cooking and presentation skills), relevant to the brief, meeting situational and customer requirements).

Year 11 Curriculum Plan - Hospitality and Catering (WJEC)

Term	Curriculum Foci
1	**Unit 2** – Hospitality and Catering in Action Students will have a focused term recapping unit 2 knowledge and x4 intensive practicals to prepare for their synoptic project in term 2 ● Importance of nutrition ● Cooking methods ● Menu planning ● Production planning ● Intensive practicals
2	**Unit 2** – Hospitality and Catering in Action Students take part in their examined synoptic project (theory and practical) Learning tasks: Students will follow a brief (set by the exam board) that has set criteria the students need to complete, including a practical assessment
3	**Unit 1** – Hospitality and Catering Industry Students will have a focused term recapping unit 1 knowledge and developing their exam skills and written answers in preparation for their summer examination Learning tasks: ● Understand hospitality and catering provision ● Understand how hospitality and catering provisions operate
4	**Unit 1** – Hospitality and Catering Industry Students will have a focused term recapping unit 1 knowledge and developing their exam skills and written answers in preparation for their summer examination Learning tasks: ● Understand health and safety in hospitality and catering ● Understand food safety in hospitality and catering

Final Assessment

Component	Weighting	Content
Unit 1: The Hospitality and Catering Industry	40%	Written Exam (External assessment): Topics: ● Hospitality and catering provision ● How hospitality and catering provisions operate ● Health and safety in hospitality and catering ● Food safety in hospitality and catering
Unit 2: Hospitality and Catering in Action	60%	Controlled Assessment Task (Internal Assessment): Unit 2 is a synoptic project that is based around a brief issued from the exam board and has set criteria that students need to complete, including a practical assessment. Students will apply their knowledge gained over the course (units 1 & 2) to the brief (theory tasks 1, 2 & 4) and carry out a practical (task 3) where students must demonstrate their knowledge of health and safety, food safety and their practical skills (preparation, knife, cooking and presentation skills), relevant to the brief, meeting situational and customer requirements).

Year 10 Curriculum Plan Design and Technology/ Product Design (AQA)

In Year 10 students are taught the theory for the three sections of the exam paper through a mixture of practical, computer based and theory based lessons as follows:

● Section A: Core technical principles – including an understanding of the working properties of a range of materials including new and smart technologies.

● Section B: Specialist technical principles – developing an in-depth knowledge of at least one material area, which would include using, and working with the material using specialist techniques, industry knowledge and how it impacts on planet Earth. Due to the equipment available in the D&T workshop, we focus on working with timber for the theory knowledge in this section.

● Section C: Design and making principles –understanding how to design and develop prototypes for different design problems, considering the needs of the user. Understand how to carry out relevant research and how to communicate design ideas effectively. This is predominantly taught through a mini design challenge in term 3.

Term	Curriculum Foci
1	**Section B: Specialist Technical Principles in working with timber** ● Theory of timber and boards – characteristics / properties /seasoning and conversion ● Sustainability of timber – ethical / ecological / life cycle issues /research on deforestation. ● wood finishes – workability of different timbers ● Working with wood -chiselling, drilling, planes, laminating, routing, turning ● Temporary fittings and components – nuts and bolts, wood screws, countersink, pilot holes, clearance holes, drilling jigs – batch production Formal external assessment details
2	**Section A: Core Technical Principles** ● Core knowledge of quantity production ● Product analysis of electronic products – mobile phone – maintenance issues – built in obsolescence, ecological /social footprint ● core knowledge of polymers / natural plastics including life cycle of polymers – 6Rs ● 3D drawing techniques – isometric and exploded ● Enterprise – crowdfunding / virtual marketing / fairtrade Formal external assessment details
3	**Section C: Designing and Making principles: mini contextual challenge to**: ● Identify a user/client/focus group that is relevant to the contextual challenge and undertake a comprehensive investigation of their needs and wants, with a clear explanation and justification of all aspects. ● show evidence of investigation to support and inform ideas and to write a short design brief and define design specification criteria, which is fully justified, linking to the needs and wants of the client/user and informs design ideas. ● Sketch out a range of initial design ideas that are imaginative, creative and innovative. These should have been generated avoiding design fixation and with full consideration of functionality, aesthetics and innovation. ● Demonstrate evidence of iterative design, which could have resulted from considerations linked to testing, analysis and evaluation of sketches and /or modelling of a prototype.Students then present their idea to other D&T students and obtain evaluative feedback to justify any modifications they would propose for future developments.

4	**Section A: Core Technical Principles** Through a series of theoretical lessons students will learn about a broad range of materials and their properties ● Mechanisms ● Papers and Boards ● Metals and Alloys ● Textiles ● Electronics
5.	**Revision for Mock exam** ● Revision lessons to recap majority of theory for the mock exam
6.	**Non – examined Assessment (NEA)** The exam board releases three design contexts for students to choose from in order to start their NEA final project, worth 50% of the GCSE. Through term 6 and the summer holidays students spend their time investigating their chosen design context and establishing their own design brief and specification.

Year 11 Curriculum Plan - Design and Technology (Product Design)

Following on from starting their NEA final project in term 6 of Y10, students continue with their NEA design development at the start of Year 11. The focus for the first three terms of Year 11 is to complete their NEA, including making a final, functioning prototype. Once the NEA is complete, students recap the theory covered in Year 10 and focus on exam technique in preparation for the final exam.

Term	Curriculum Foci
1	**Non- examined-assessment (NEA)** ● Generating and developing design ideas for the NEA final project. ● Students present their initial design ideas to the class and evaluate them, going on to produce further ideas that show experimentation and clear communication, using a wide range of techniques and design strategies for different purposes. Formal external assessment details ● NEA –A A01– Investigating chosen design context, Design Brief, Specification (20 marks) = End of September ● A02 C – Generating design ideas (20 marks) = End of October
2	**Non- examined-assessment (NEA)** ● Realising design ideas and creating a final prototype ● Students are to carry out detailed development work using a wide range of 2D and 3D techniques, including CAD where appropriate, in order to develop a prototype ● Students need to demonstrate they can select the correct tools, materials and equipment, (including CAM where appropriate, and use them consistently safely and with a high level of skill ● Students need to ensure the prototype is made accurately by consistently applying quality control checks to very close tolerances. Formal external assessment details ● A02 D – Developing design ideas (20 marks) = End of November
3	**Mock Exam Revision** ● Recap of knowledge covered in Year 10 for Section A, Section B and Section C of the exam paper Demonstrate and apply knowledge and understanding of: ● Core Technical principles ● Specialist Technical principles ● Designing and Making principles Formal external assessment details (delete if not required) ● AO4 – full mock exam =Start of Term 3 ● A02 E – Realising Design Ideas (20 marks) = End of February
4	● **Non- examined-assessment (NEA)** ● Finalising a final, functioning prototype and testing and evaluating it ● Students need to complete comprehensive testing of all aspects of the final prototype against the design brief and specification. They need to justify any modifications they have made or would propose for future developments ● Formal external assessment details (delete if not required) ● NEA-AO3 – analysing and evaluating plus full NEA marking= Mid March
5.	**Revision and Exams**