Design and Technology at King's Academy Ringmer

End point	Knowledge acquired	Skills acquired
Year 7		
Design and manufacture **Tatty Devine Jewellery** with support from **CAM** machines. Building technical drawing skills by using **CAD programs**	• Key terminology • Building alternative drawing skills. • Realising the positives and negatives of CAD and CAM programs and processes. • How to turn a complete design into separate components. • Working with polymers. • Building knowledge on papers and boards and their properties to make them appropriate for packaging.	• 2D representations • 3D representations • Annotation development • 2D design • TinkerCAD introduction • Create a piece of jewellery • Communicating through various drawing styles; CAD, exploded view, 3D hand drawing.
Design and Manufacture a **Memphis Wall Cloc**k	• Develop awareness/**knowledge** of H&S in the subject, build on subject specific vocabulary and introduce to techniques and uses of key machines/processes/tools - **readiness** for subject through ks3/ks4 • Build in secure basic **knowledge** on timbers • **Understand** and develop key principles of a particular design style and how to implement this into their own work - **readiness** for further KS3/Ks4 • Build **knowledge** on how to develop and analyse effectively to improve work • Progress their **understanding** by learning how to evaluate effectively to improve finished products to **inform** future work in KS3/4	• Develop **skills** in practically working with timbers and working to tolerance • Develop the **skill** on how to follow a brief and specification - exposure to this in **readiness** for further development throughout ks3/4 • Build the **skill** to keep open minds when designing and avoid design fixations • Practice the **skill** of reflecting on ideas through development and improvement (iteration) • Creating templates to improve their **skill** in ensuring accuracy in outcomes.
Food and Nutrition - introducing students to basic food preparation, safety and skills.	• Healthy eating and the importance of a balanced diet • Understanding how to use Eatwell Guide • Understanding ''8 tips for healthy eating'' • Food hygiene and safety • Correct and safe use of knives • Heat transfer - conduction, convection, radiation • Sensory evaluation	• Working hygienically in the Food room • Safe use of the hob, grill and oven • Safe use of knives • Weighing and measuring • ''Rubbing in'' flour and butter • Layering ingredients • Judging and adjusting the sensory qualities of food • The importance of presentation

	Key words hygiene, safety, bridge and claw grip, nutrition, balanced diet, heat transfer, enzymic browning, preparation, teamwork, evaluation	• Teamwork in food preparation
Year 8		
Further build upon CAD skills to produce a **Art Nouveau style USB light.**	• Building upon **knowledge** on how to use CAM machines and the manufacture process of using a laser cutter, understanding the -/+ of its uses • Designing in the style of a previous design/art movement, Art Nouveau and the work of others, Louis Comfort Tiffany. • Experimenting with various polymer moulding equipment; line bender, thermoforming oven and the use of jigs. • Build electronics **knowledge** by visiting inputs/outputs and standard components • Building upon **knowledge** on communicative design by using CAD to produce 3D design work. • Using metal fusing processes and exploring basic metals and properties.	• Develop the **skills** to produce a product with a real focus on 'user centred design' and recognise the importance of meeting their needs • Add to their **skills** of producing an original outcome inspired by art movements and the work of others. • Revisiting CAD **skills** to develop working drawings to be used on a CAM machine and develop their 3D skills to further support them in GCSE level - building their knowledge on how CAD can support designing • Building their CAD **skills** to support Technical drawings further - orthographic projections/Obliques/Isometrics • develop their **skills** of evaluation by putting together 3 aspects to an evaluation: user, specification, brief to help them suggest appropriate improvements to their end result
Investigate an organisation and create a **Herb Rack** that focuses on a USP.	• build upon **knowledge** on how to explore existing products -/+ to inform own designs • develop a deeper **knowledge** & understanding on wider issues such as Deforestation and Carbon Footprint • Develop the **skill** and **knowledge** on what makes up a brief and use that information to create a specification in **readiness** to support further projects in KS3/4 • Revisit knowledge of timbers and appropriate treatments used to prolong their longevity. • Build **knowledge** in understanding jigs and their role in a production line. • Build upon graphics **skills** and creating a USP that supports a design's use.	• Develop the **skills** to produce a product with a real focus on USP (Unique selling point) and recognise the importance of designing for a client and profits. • Building on CAD **skills** to create a graphic design to appear on the surface of a product. • Gaining **skill** in using treatments to provide longevity to a product and choosing the appropriate surface treatment for the products desired purpose. • Gaining **skill** in creating accurate wood joints.
Food and Nutrition - continuing basic food preparation,	• Health and safety recap • Bread making • Pasta - making and cooking	• Making and cooking bread dough, using yeast as a raising agent • Preparing and cooking additional carbohydrates, inc.

safety and skills.	• Starch based sauces, reduction sauces • Working with meat and eggs - production, functional properties and nutritional content. **Key words** protein, aeration, coagulation,carbohydrate, gelatinisation, raising agent, kneading, proving, reduction sauce, high risk, bacteria, cross contamination, temperature probe	pasta • Preparing sauces • Safe meat cookery including handling and cooking temperatures • Uses of eggs in cooking - aeration and coagulation • Heat transfer (recap)
Year 9		
Design and Technology		
Produce an educational **Mechanical cam toy**	• build upon **knowledge** on the importance of clear and thorough annotations to communicate designs. • **Understand** the process of designing for educational purposes and appropriate learning opportunities for children. • Develop understanding of motions, linkages, cams and their role in converting movement.	• practise the **skills** developed throughout ks3 to design a well communicated idea which avoids design fixations. Develop the **skill** on presenting and communicating designs in a more advanced way in readiness for GCSE • Practise the **skill** of annotations in readiness for GCSE level work • Practise the **skill** of producing a moving product and accurately choosing an appropriate cam for the design choice. • develop the **knowledge** on how to adapt evaluations to be more user centred
Collaboratively develop an understanding of **New Materials - Smart Materials**	• Build **knowledge** on GCSE content - Smart materials (x5) , their uses and products that might use them and why. Work in teams to explore them.	• Know how to develop new products using new and emerging technologies
Further build upon potential design outcomes by producing a ‘user centred’ **hand held device.**	• Building a **knowledge** on how model development can enhance the comfort and functionality of a product. • Practising their **knowledge** from prior learning to create their own informative brief and specification from just a context - supporting GCSE NEA project • Build on iterative design approaches to avoid design fixations and allow the shape of moulded polymorph to inspire the design idea. • Gaining **knowledge** on ergonomics and anthropometrics and their importance in ‘user centred’ designs.	• Develop the **skills** to produce a product with a real focus on 'user centred design' and recognise the importance of meeting their needs • Add to their **skills** of analysing existing products by completing a thorough ACCESSFM to inform their ideas -/+. Supporting the readiness to progress to GCSE • Revisiting CAD **skills** to develop working drawings to be used on a CAM machine and develop their 3D skills to further support them in GCSE level - building their knowledge on how CAD can support designing • Practise the **skill** of following a manufacturing

	• Experiencing Smart Materials and their role in supporting ergonomic designs and other benefits.	specifications and its importance in having one - in readiness for GCSE and supporting independent work • Building **skills** in modelling and prototyping ahead of their NEA in GCSE to realise the importance of the process. • develop their **skills** of evaluation by putting together 3 aspects to an evaluation: user, specification, brief to help them suggest appropriate improvements to their end result
Food and Nutrition		
Food and Nutrition - continuing and consolidating food preparation skills.	• Recap Food Room hygiene and safety • Recap safe handling of high-risk foods • Food choice - British foods • World cuisines - factors that contribute to the development of different national cuisines. **Key words** bridge and claw grip, high risk, contamination, authentic, traditional, cuisine, climate, terrain, economy, culture, marinade, tenderise, garnish, presentation, styling, Muslim, Hindu, vegetarian, vegan.	• Ingredients and cooking techniques from around the world • Use of traditional regional ingredients and flavourings • Adding a breadcrumb coating to meat or fish • Cooking rice and noodles • Cooking in a wok/large skillet • Flavouring with less salt, using spices and herbs • Benefits of using a marinade • Making a simple flatbread
Key Stage 4		
Design and Technology 9-1 AQA Timbers		
A focus on **Timbers**	Felling Process/ Seasoning/Stock forms Softwood/Hardwood/Manufactured boards	Give examples and reasons for usage Advantages/Disadvantages of the processes and long response answers
Practically understanding working with Timbers - **Specialist Principles**	Marking out/QC/QA Wood Joints/Hegner Saws/JigSaw/Router CAD CAM Laser Cutter Advantages and disadvantages of CAD/CAM	Making and processes skills for timber specialism Names and uses of tools Working within tolerance & QC/QA
Understanding how to protect and finish Timbers	How to finish timbers - pro/cons	

Sustainability and Energy	Know and give examples of finite andnon-finite & LCA Finite Resources Energy Storage	Be able to discuss each form and give reasons
Key Point Assessment	energy, categories of timber, felling, finite, wood joints, CNC routing	
Discovering a sound knowledge of polymers, metals, papers and boards & textiles	Material Category examples & usage give examples of products know examples and how to categories them Working with cotton - creating a macrame wall hanging & feather (extension - star)	Oven (wind chime) Vac former tray for chocolates - each student Practical processes working with polymers Working with cotton - feeling the properties
Key point Assessment	Material categories & Processes - vac form, injection mould, origins,	
Securing techniques for modelling and evaluation	To know common modelling materials and why they would be chosen : To be able to select suitable modelling techniques	Start styrofoam model (filler if possible) Model with styrofoam or Card and use correct techniques to carry this out What is expected in an evaluation for a model and how iteration happens Practical - Corrugated card toaster model 1 xdouble (using teacher example
Forces and Stresses across materials & Mechanisms	To understand the key words from the AQA specification and how they are applied on/in products: Tension, Torsion etc.Theory content Levers, Motion, Gears & Pulleys	
Putting Skills to the test through developing a spice rack	isometric, Perspective, orthographic and rendering Cad Drawing 6R's assessment on developed design Scales of production TasK	To be able to use techniques to draw Use CAD to draw in 2D and 3D with rendered products & to use iso grid Starter Automation in industry & development SCAMPER of spice rack Exploded view and Orthographic of chosen design Students to demonstrate practical skills & to know the 4 scales of production and examples of each one.
Work of others	Students to know key dates and designs from 4 areas.	Design in the style of for practice in NEA7

	Students to know about 2 companies and 2 designers: - Dyson, Apple, Marcel Bruer, Ettore Sosttsass	Case Study
Analysing Products	Exam response - for running watch Product Disassembly teacher led Student consolidate and disassemble a product Exam response - for tent question group analysis with white boards - food container	
New Materials/Composite Materials/Smart Materials	Students to recognise properties of each material, selection of material for job roles	Learn and make resource on smart materials
Full Mock	n/a	n/a
NEA Mock Project		
Start the real NEA Project	Knowledge on each area that NEA's should include. Examples and teacher led support of all different techniques they may want to include: Brainstorming a context Finding a Client Locating a suitable location Client profiling Existing Product Investigation Influences - mood board Design strategies Design Development Modelling and iteration Making and Manufacturing Specifications Evaluations and Analysis	Student presentation of all areas in the Mock: Brainstorming a context Finding a Client Locating a suitable location Client profiling Existing Product Investigation Influences - mood board Design strategies Design Development Modelling and iteration
Year 11		
NEA Project	Completion of 50% of GCSE with NEA (released from AQA June 1st)	
Revision of All content	As described - Seneca/Quizlet/Flashcards/Big Picture Pages/Collins Green and Purple Textbooks/ Topic Mats	
Food Preparation and Nutrition 9-1 AQA		
	YEAR 10 (GCSE course)	

Nutrition theory	• Nutrients - proteins, fats, carbohydrates, vitamins, minerals, water • Informed food choices • Energy needs and energy balance • Diet, nutrition and health • Diet related disease • Nutritional analysis	**Practical skills to recap and build through a range of food preparation lessons. To include a broad selection of the following:** **Complex doughs and pastries -** e.g. flaky, choux **Complex sauces -** e.g. mayonnaise, hollandaise, infused veloute sauces, blended sauces **Meat and fish** • **f**illeting, portioning • Marinating, tenderising
Functional and chemical properties of food	• Proteins, carbs, fats and oils, raising agents	**Prepare, combine, shape a range of ingredients** • Roll, wrap, skewer, mix, coat, layer, shape and bind, cream, melt
Food spoilage and food safety	• Cross-contamination • Micro-organisms, enzymes, bacterial contamination • Buying, storing, preparing, cooking and serving food safely.	**Use of raising agents** • Chemical, biological, steam, manual **Setting mixtures by** • Gelation, coagulation, denaturation
Food choice	• Factors that affect food choice • Food labelling and marketing	**Use of equipment** • Oven, grill, hob, blender, food processor, mixer, pasta machine, microwave, small hand held electrical equipment,
Food provenance	• Recap on environmental concerns, with reference to current events around the world. Understanding of sustainability in food production.	**Cooking methods - recap and extend** • Steam, boil, simmer, blanch, poach, dry fry, shallow fry, stir fry, bake, roast, grill
Processing and production	• Primary and secondary processing • Technological developments in food production, including additives, fortification, GM foods, etc.	**Fruit and vegetable preparation using safe knife skills - recap and extend** • e.g. mash, snip, scoop, crush, puree, batons, julienne, pipe, zest, juice, de-skin, grate, core, segment, prepare garnish
		All general practical kitchen skills • Weighing and measuring, food and equipment preparation, selecting cooking times, testing for readiness, judging and modifying
	YEAR 11 (GCSE COURSE)	

GCSE NEA 1 Food Science investigation, written and practical, worth 15% of final GCSE	● 3 choices of task provided by exam board ● Written research ● 3 or 4 experiments ● Written evaluation and application of results	● How to choose a suitable task ● How to conduct effective food science experiments using controls and fair testing conditions. ● How to record and analyse results that can be applied to real life recipes.
GCSE NEA 2 Cookery task, written and practical, worth 35% of final GCSE	● 3 contexts provided by the exam board. Students can choose the most appropriate task for their own skill set. ● Research - written research for the chosen task. ● Skills trials - 4 or 5 practical demonstrations of food preparation skills that suit the chosen task. ● Written planning for final 3 hour cooking exam. ● 3 hour practical cooking exam which showcases students' cooking skills, suited to their chosen task. 3 products to be prepared. ● Written evaluation of final 3 products.	● How to choose the most suitable task for GCSE, that allows students to confidently display their cookery knowledge and skills. Whilst carrying out this work students must work independently and should be able to show their ability to: ● Plan and use their time effectively, demonstrate the practical skills they are most confident with, critically assess and improve their work throughout.
Written exam (worth 50% of final GCSE)	● In class revision of all work for written exam. ● Independent revision in student's own time.	● Students revisit all theory study and practise how to approach written exam questions to acquire the maximum marks.