Design and Technology department curriculum intent

Department curriculum 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. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

In line with the National curriculum, the DT department at Settle College aim to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- 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
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

A Settle College student who studies Design and Technology from Year 7 through to Year 11 should be a confident and independent learner who aspires to be the best they can be without limitations. They should be highly creative thinkers, explorative navigators of possible content and inclusive of iterative processes through their designing and practical outcomes. Our students should work smarter, think bigger and aim higher in all of their work outcomes and will be the next generation of creators and innovators for the future.

We facilitate the vision for our students with a broad range of challenging projects that effectively prepare them for GCSE, A Level and beyond. In Design and Technology, we encourage effective debate, challenging them to question and reflect on their culture/lifestyle/values/impressions allowing students to develop their understanding of other lifestyles cultures and beliefs. We train and encourage effective research; our students should question the information found and ensure that it is accurate and reliable.

We offer opportunities for students to look at past and present professionals and movements developing their skill and experience in the creative design process. Practical skills, including health and safety and good organisation, develop effectively by well-planned and resourced projects, thus ensuring success in KS4 and 5.

Curriculum mapping

Year 7	*DT is taught on a carousel basis, with students completing each project for a term, although not necessarily in the order shown below.*			
		Food and nutrition	**Design Technology**	**Technology skills**
	Intent for the topic	Food skills Safe and hygienic food handling Develop organisation and practical skill in preparing and cooking food.	Desk tidy project Know my way around the workshop. Apply H&S and practical skills to create high quality products.	Skills induction Develop skills and knowledge to enhance design and technology understanding and products.
	Content mapping	Safe and hygienic food handling Equipment skills i.e. knife handling, cooker use, cooking methods Food provenance - seasonality Government Guidelines for Healthy Eating Evaluating dishes Practical lessons	Keyring/fridge magnet, desk tidy, structures, basic electronics. Design process, 2D CAD, plastic properties.	CAD - TechSoft 2D Design. Graphic design software Structures – using Bridge designer Research task – smart materials Electronics - Circuit wizard Microbit - embedding intelligence in products.
	Key skills developed	Apply H&S and hygiene techniques in practical lessons. Knife Skills/Bridge/Claw Use of hob to boil/simmer Kneading, mixing, using the oven, proving bread. Rubbing to make scones. Handling high risk foods, forming and shaping. Effective use of time in practical (organisation)	Apply H&S techniques in the workshop Developing ideas Modelling methods used for the desk tidy Use of the saw, file and finishing techniques for an acrylic product Effective use of time in practical (organisation)	Select the right tools and features to create a CAD design to be efficiently produced using CAM. Apply understanding of smart materials to be able to enhance a product Apply understanding of structures to create a solution to a given problem Demonstrate effective use of software to create circuits and intelligent products.

Year 8	*DT is taught on a carousel basis, with students completing each project for a term, although not necessarily in the order shown below.*			
		Food and nutrition	**Graphic design**	**Product design**
	Intent for the topic	Food and Nutrition Know and apply good hygiene practice Develop organisation and practical skill in preparing and cooking food. Develop knowledge and understanding of Food and nutrition and apply to different dietary needs	Pop-up cards Card mechanism To develop experience and skill in the design and making process. Apply practical skills and understanding to create a high-quality card pop-up card.	Mood lamp To develop experience and skill in Engineering. Apply practical skills and understanding to create a high-quality mood lamp.
	Content mapping	Healthy food decisions using the eat well guide Macronutrients (proteins, carbohydrates, fats), Micronutrients (fat soluble vitamins, water soluble vitamins, minerals) Nutritional needs of people at different life stages	Pop-up card More in-depth design process stages. Quality Control. Mechanical systems homework	Mood clamp Wood properties/ simple manufacturing processes. CAD/CAM, Electronics application
	Key skills developed	Apply H&S and hygiene techniques in practical lessons Weigh, measure, grate, combine, knife skills (chop, slice, dice, trim), portion, divide, bake, sift, fold, core, beat, mix, stir and combine, drain, peel, zest, form and shape, melt, simmer, boil, knead, fry. Effective use of time in practical (organisation) Application of nutritional information to plan balanced meals for a variety of audiences.	Following plans to create a product. Quality control to create an effectively assembled product. Developing ideas and isometric, orthographic drawing. Modelling and Iterative testing to produce an original pop-up card Effective use of time in practical (organisation)	Apply H&S techniques in the workshop. Use of workshop tools, CAD/CAM, assembly and finishing techniques to manufacture Mood lamp. Effective use of time in practical (organisation).

Year 9	*DT is taught on a carousel basis, with students completing each project for a term, although not necessarily in the order shown below.*			
		Food and nutrition	**Product design**	**Engineering**
	Intent for the topic	**Food choice** Further develop their H&S and food preparation skills Build on food and nutrition from yr 8, applying to a range of life choices and needs (e.g. religion, allergies)	**Packaging** To develop experience and skill in the design and making process. Apply practical skills and understanding to create a high-quality Packaging.	Engineered lamp
	Content mapping	Preparing more complex meals Develop and demonstrate the principles of food hygiene and safety. Catering for a multicultural society. Catering for ethical choices. Catering for food allergies and intolerances. World foods. Food Provenance. Food Security and food waste.	Packaging CAD – Techsoft software, Photoshop skills 2D/3D design	Lamp manufacture Theory – engineering machines, engineering sectors, metals, plastics, joining methods, drawing techniques
	Key skills developed	Apply H&S and hygiene techniques in practical lessons. Knife skills (bridge and claw, peeling, vegetable cuts), sauté, frying, combining, high risk foods, simmer, grilling, shaping, forming. Effective use of time in practical (organisation). Troubleshooting issues during practical.	Apply H&S techniques in the workshop. Developing ideas and photoshop skills. Use of CAD/CAM to create packaging components, including effective assembly. Effective use of time in practical (organisation).	Engineering processes and equipment (marking up, saw, file, finishing techniques, lathe, drilling, Annealing/bending, laser cutting, countersinking). CAD/CAM for lamp face and base. Quality assurance and Quality control.

	Product Design					
		Half term 1	**Half term 2**	**Half term 3**	**Half term 4**	**Half term 5**
Year 10 & 11	Intent for the topic	Tea light holder project, Skills & theory	NEA & theory	NEA & theory Mock exams will be within the earlier part of this HT	NEA & Exam revision	Contingency – Time to complete NEA if needed and revise for exam
	Content mapping	Use tools, machines, and techniques to manufacture a Tea light holder. Develop 3D CAD skills. Develop materials and manufacturing theory (timber, plastics& smart). Develop drawing and presentation skills. Iterative design.	Develop electronics mechanisms, CAD CAM theory. NEA Analysing a design brief, Product analysis, Specification. production methods, new & emerging technology, energy, green design and design strategies.	Initial ideas Modelling techniques Refining and evaluating ideas (development design) CAD Final design idea Develop materials and manufacturing theory (smart, metal and adhesives).	Final design idea Prototype production Making diary Orthographic projection Test and evaluate finished prototype Theory – textiles, forces & structures, cultural/social/ economic factors, materials and manufacturing (paper and board).	Final deadline for NEA - 27th March Four weeks after Easter break to ensure final moderation and tweaks done. This time will also include revision exercises and exam practice. All NEA work submitted to the exam board by 15th May.
	Key skills developed	CAD CAM to manufacture the Tea light holder, finishes, potential use of the following methods, depending on students, Laser cutter, Use of jigs vacuum forming, 3D printing, line bending, annealing, vinyl cutter. 3D CAD software	Desktop and internet research skills. Investigate existing products. Further Research – This will be exam board context specific (students have a choice from six contexts, this could include research on: User, dimensions, analysis, etc.) Generating analysis. Specifications and ideas.	Design skills to create initial, development and final ideas. Iterative design process. Modelling techniques CAD	Prototype production - This will be exam board context specific (students have a choice from six contexts). Apply H&S techniques in the workshop Use of workshop tools, CAD/CAM, assembly and finishing techniques to manufacture their product. Effective use of time in practical (organisation).	Continuation from half terms 2-4.

	Engineering				
	Half term 1	**Half term 2**	**Half term 3**	**Half term 4**	**Half term 5**
Year 10 & 11					
Intent for the topic	Unit 1- Practice - lamp	Unit 1 – phone holder	Unit 1 – phone holder finish and start Unit 2- Design engineering Mock exams will be within the earlier part of this HT (some flexibility added due to this).	Unit 2- Design engineering Complete all units and final preparation for Unit 3 (exam)	Preparation for Unit 3 (exam)
Content mapping	Lamp manufacture Theory – engineering machines, engineering sectors, metals, plastics, joining methods, drawing techniques	CAD CAM to manufacture clamp components Lamp production plan Making Diary GANNT chart Risk assessment QC checks and evaluation	Phone holder evaluation Making diary Tidy up and completion of unit 1- lamp. Research and analysis of Unit 2- Design engineering specification Drawing techniques Ideas, evaluation development, modelling and CAD design Complete Unit 2- Design engineering Theory (most is recapping)– industrial processes, environment/sustainability, metals, plastics, joining methods, drawing techniques, conversions, maths skills, composites, modern and smart materials.		Exam practice
Key skills developed	Engineering processes and equipment (marking up, saw, file, finishing techniques, lathe, drilling, Annealing/ bending, laser cutting, countersinking). CAD/CAM for lamp face and base. Quality assurance and Quality Control.	Engineering processes and equipment (marking up, saw, file, finishing techniques, lathe, drilling, Annealing/bending, CNC lathe, vacuum former).	QA & QC testing. Assembly Drawing methods Modelling methods 3D and 2D CAD design Basic IT skills (to create the assignment report)		Application of disciplinary knowledge as seen in prior 1-2 terms

	Food preparation and nutrition					
	Half term 1	**Half term 2**	**Half term 3**	**Half term 4**	**Half term 5**	**Half term 6**
Year 10 & 11						
Intent for the topic	An introduction to the theory of food preparation and nutrition	Continuation with the theory work, whilst completing a food science investigation.	The focus of this term is the second NEA, where students plan, prepare and evaluate their own dish. The theory side of the course is finished this term.		Revision and exam preparation	
Content mapping	Two practical lessons per week. Macro/micronutrients. Fruit and veg - five a day, provenance, seasonality, classification, food miles, nutrients. Meat & fish - types, science of meat, nutrients, choosing health meats, hygiene and storage, how it's grown/reared/processed. Eggs - structure, science of eggs, quality marks, using eggs. Life stages and nutrition, dietary considerations.	Two practical lessons per week. NEA1 - practicing planning an investigation (feedback to be given on this attempt) NEA theory - star charts, sensory analysis. NEA1 completion.	Bread and cereals - flours, multicultural breads, grains, milling of wheat into flour, processing, bread making process, nutrients. Trialling recipes for NEA2 Content taught in here will depend on the title for NEA2 Students need to choose their list of dishes by the end of half term 3. NEA2 dishes selected and teaching around skills for NEA2. NEA2 - planning, practical exams and evaluation.		Dairy - types of dairy, processing, types of milk, uses, storage, nutrients Revision & exam practice	
Key skills developed	H&S, Hygiene, preparation, heat and presentation skills for a variety of different food groups. Food science.	Developing hypothesis, investigation and research, practical experimentation (food trials) to prove or disprove hypothesis. Sensory analysis and evaluation.	Investigation into the task set (key skills will vary depending on the task set by the exam board). Make selection of dishes suitable for the task, demonstrating their skill set Sensory analysis and evaluation.		Application of key skills as seen in prior 2 terms	

	Hospitality and catering					
	Half term 1	**Half term 2**	**Half term 3**	**Half term 4**	**Half term 5**	**Half term 6**
Year 10 & 11						
Intent for the topic	Unit 1: LO4 Know how food can cause ill health LO1 Understand the environment which hospitality and catering providers operate	Unit 2: LO1-3 Understanding the importance of nutrition Factors affecting menu planning How to plan production	Developing and applying Unit 2 prior knowledge from last term. To include: How to prepare and make dishes Presentation techniques Food safety practices NEA start	Developing and applying Unit 2 prior knowledge from the last 2 terms. NEA Preparation for practical exams Practical Exams here.	Revision Preparation for written exam	
Content mapping	Unit 1 - LO4 Food related causes of ill-health Symptoms of ill health Control measures EHO Unit 1 - LO1 Commercial/Non-commercial Food Service Star Rating Working in the industry Working Conditions Contributing factors to success	Unit 2 Menu Planning How to plan production Dovetailing & sequencing Skills / Complexity Food Safety Practices Evaluations Macro/Micro Lifestyles Special dietary needs Cooking methods	Coursework/NEA introduction Unit 1 - LO2 Operations Front/Back of House Customer requirements Meeting specific needs Planning for NEA	NEA Use techniques in preparation of commodities. Assure quality of commodities to be used in food preparation Use techniques in cooking of commodities Complete dishes using presentation techniques Use food safety procedures	All of the prior content including unit 1 L03 recap Revision and exam practice	
Key skills developed	Apply H&S and hygiene techniques in practical lessons Knife skills, fruit and vegetable preparation, preparing combining and shaping, tenderise and marinate, weigh and measure, equipment use, water-based methods using the hob, dry heat and fat-based methods using the hob, grill use, oven use, sauces, raising agent use, dough, readiness testing, judging and manipulating sensory properties Effective use of time in practical (organisation) Troubleshooting issues during practical				Application of key skills as seen in the prior two terms.	

		Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Year 12 – Product design	Intent for the topic	Induction Cover required theory and skills for the qualification	Fragrance project	Architecture project Epoxy resin casting Mock exams	NEA		NEA Mock exams
	Content mapping	H&S, regulations, risk assessment, PPE Theory – plastics & plastic forming, tools, jigs/manufacturing aids, performance characteristics/ properties, machining processes, sketching/ presentation techniques CAD CAM, finishes, maths for engineering metal properties, joining and heat treatments & manufacture, human factors.	CAD 2D design Scales of production Intro to project - Brief, task analysis, mood boards, product analysis Manufacturing industries, designing for the environment, planning, specification, ideas, design movements/designers, digital technologies, development design, CAD/CAM Packaging design and development	Foam board modelling, marketing and budgeting, drawing methods (isometric and Planometric) Resin casting Review project Theory – composites, timber, lamination, wood joining, finishing techniques, papers and boards, printing techniques, product lifecycle.	Investigation into NEA project Sketching/ presentation skills Photoshop skills 2D and 3D CAD Exam practice – recap /revise past theory NEA – identify design possibility & company/client. Task analysis	NEA – Task analysis Research and analysis,	NEA – Research and analysis
	Key skills developed	Workshop tools and machines and organisation in practical, plastic forming methods. Using Jigs, Drawing techniques, CAD CAM, finishes	Design and analysis skills – iterative approach Use of IT - CAD/CAM (Photoshop, Techsoft, Laser cutting, 3D printing)	Workshop tools, machines and organisation in practical. Shaping and finishing techniques.	Design /drawing skills Use of IT for CAD and photoshop software.	Use of IT for NEA research/analysis and presentation.	Use of IT for NEA research/analysis and presentation.

		Half term 1	Half term 2	Half term 3	Half terms 4 and 5
Year 13 – Product design	Intent for the topic	NEA - Research	NEA Exam practice	NEA and exam practice	NEA and exam practice
	Content mapping	NEA Research and analysis Specification Design ideas and communication of ideas Review ideas Development of design ideas and the iterative design approach	Further research-Materials testing Development of design ideas and the iterative deign approach Design movements/designers, specific materials, industrial manufacture manufacturing specification and final design solution Practice exam	Review of development and final idea. Final prototype manufacture.	Finish final prototype Third party manufacture Testing and evaluating the prototype. Exam revision and practice
	Key skills developed	Use of IT to collate information for NEA Design process, methods and drawing techniques.	Use of IT to collate information for NEA and write the manufacturing specification. Design process, methods and drawing techniques. Application of design inspiration methods. CAD to develop final design	Tools, equipment, and machines. Quality and accuracy checks Making diary. Shaping and finishing methods organisation in practical. CAD/CAM.	Same as last term and exploded drawings, manufacturing specification, Orthographic drawings, risk assessments. Testing and evaluating the prototype.