

CLAYTON HALL ACADEMY

Faculty and Department Curriculum and Assessment Handbook

Name of Faculty/Department: 21st Century Technology/ **Design and Technology**

Our Curriculum Intent

High-quality design & technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation. Our team aim to develop resilient, independent and confident students who have design, practical and evaluative skills and analytical knowledge.

Students design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. Students are encouraged to foster globally-responsible attitudes through investigating materials, technological developments and an understanding of sustainability on a local, national and international level.

All our subjects include an understanding of how the world works and going forward to anticipate jobs that have not yet even been created. Technology is an ever-expanding discipline that has problem solving at its core, is academic as well as practical, involves learning through doing and we hope above all, enjoyable.

Gold Standard Teaching and Learning in Design and Technology

Goal Orientated (Planning for Progress)

- Data driven Seating plans (highlighting DP, HAPs, MAPs, LAP, SEN)
- Students will engage in a Starter Task in every lesson (this can be a written or an oracy task).
- Differentiated Blooms, learning objectives displayed clearly.
- Students understand the Big Picture, what they are learning and why: links to prior learning made clear.
- Clearly identified links to Personal Development (RIC).
- Highly effective questioning to identify and address misconceptions.
- Formative and Summative Assessment to diagnose and inform next steps.
- Model excellence and how to achieve it.
- Revisit and 'low stakes' testing e.g. Starter and Plenary quizzes to make connections and support recall.

Open dialogue (Feedback for improvement)

- High quality feedback is given in response to specific pieces of work.
- Progress tracked on student's assessment maps.
- Regular formative assessment will be varied and impactful e.g. framed as a question as opposed to a comment.
- Live marking is encouraged to manage workload and teachers are encouraged to have 'purple pen in hand' when they are intervening with students during the lesson.
- Literacy corrections in line with stickers.
- Student response to feedback (DIRT) using green pen.
- Self and peer-assessment used to develop independence.

Learning Environment

- Positive Learning Environment created by mutually respectful relationships (staff/pupil + pupil/pupil).
- Adults consistently model the values of the school and support curriculum intent.

- Engaged, enthused and independent learners- Lighting Fires Curriculum.
- Reward effort and resilience by providing opportunities for students to speculate, investigate, and make mistakes.
- Consistent application of the Consequence and Achievement system.
- Students show pride in their learning through the presentation of their work:
 - o Neat organised books/folders with Assessment maps and Target stickers
 - o Date and title underlined with a ruler- classwork and home study clearly identified
 - o Support should be provided for students who miss lessons, either through Teams or via email.

Differentiation for Challenge and support

- Use of data and student information to plan for individual needs. (Prior Attainment, FFT 20/5 Target data, SEND)
- Differentiated learning outcomes (these can be verbalised or displayed in the classroom)
- Stretch and challenge- upholding high expectations for HAPs (Over 50% of our cohort)
- Targeted questioning- include all students and make students think, using open and follow up questions to expand understanding. No hands up.
- Improve oracy in the classroom; students respond to questions or contributions in full sentences (talk for writing).
- Additional intervention for disadvantaged, Vulnerable, VIP, with a particular focus on Narrowing the Word Gap.

Long Term Assessment Plan – Key Stage 3

Year 7 (full term rotations)

When?	What we are Learning and Assessing e.g. Topics/ Skills etc	How we are Assessing e.g. Extended writing, Project, exam etc	Links Backwards and Forward When was it last covered & when next?
Termly Rotation of the following four material areas	Introduction to Design Technology Start introduction to the four material areas describe and explain the termly rotation process. (4 material areas, 8 rotations across KS3 and then an option choice for Y9 summer term).	Graded individual skills to form part of holistic measure	Building on KS2 mathematics and literacy skills. This then creates a foundation of knowledge and transferable skills that supports each area of the carousel within the technology department. For example measuring and marking out can be used in product design with rules and try-squares but also in Food with measuring jugs and scales.
Graphics Technology Rotation	Drinks carton project – Research, design make evaluate project activity through understanding nets, paper and board construction techniques and the application of colour.	Graded individual skills to form part of holistic measure End of rotation assessment	Developing creativity, accuracy and application of colour to support the quality of communication required for GCSE Design & Technology
Products Technology Rotation	Gumball Machine Project - Skills, make and evaluate project - understanding the use and application of materials, tools and equipment.	Knowledge of tools, equipment materials and processes Accuracy of measuring and marking out CAD (computer aided design) Quality of practical outcome End of rotation assessment	Developing key knowledge, skills and understanding of wood workshop Health & safety, tools, equipment machinery and manufacturing processes to promote the competent and safe independent use of machines required at GCSE level in D&T and construction when manufacturing projects and portfolio work pieces.
Engineering Technology Rotation	Situation and brief Reading engineering information Tools used in mechanical engineering Practice safety and accuracy Method (planning) Safety using powered machines Machine settings CAD Product research and use (mechanical arm) Packaging design for mechanical arm Mechanisms and movement. Pivots, levers, fulcrums. Also riveting process Design development. Bottle opener practical End point assessment	Verbal questioning and responses Written responses Written responses (strength target response) Teams' assignment photo Written responses (strength target response) Self-assessment using RAG Written responses (strength target response) Self-assessment using RAG Teams' assignment using STR Peer assessment compared to examples Written responses (strength target response) Self-assessment compared to the brief Photo evidence on teams STR feedback Teams quiz on material taught over the term	Future studies on material choice and recycling All projects require the need to extract information from a drawing. Links to unit 1 WJEC in engineering. Tools used throughout engineering 7-11. KS4 students have to work to real standards in engineering. Supports further understanding on how to do a process or products. For unit 1 WJEC engineering students need to be able to plan the sequence of how to make a given item Safety is always reinforced and practiced to current legislations and operations procedures. Teaches students' independence and leadership qualities For future use of machines throughout their time at clayton Unit 2 for WJEC engineering requires students to completed own CAD solution which is an improvement upon a given drawing.

When?	What we are Learning and Assessing e.g. Topics/ Skills etc	How we are Assessing e.g. Extended writing, Project, exam etc	Links Backwards and Forward When was it last covered & when next?
Food Technology Rotation	<p>Introduction to Food preparation and Nutrition. Safety, Hygiene, Equipment, Practical task</p> <p>Food is within a rotation with Design and Technology and students study Food for 1 full term during year 7</p> <p>Introduction to Food preparation and Nutrition. We cover a range of theoretical topics such as Hygiene & Safety, identifying and uses of Equipment</p> <p>Practical tasks include Knife skills, Using the cooker & hob, judging when foods are cooked.</p> <p>Practical tasks this half term include fruit salad, potato wedges and French bread pizza.</p> <p>We look at the importance of eating well, how diet and health are linked together. We also study how some people need special diets to keep them well and how we might adapt recipes for them.</p> <p>Practical tasks this half term include pasta salad, scones and fruit crumble</p> <p>Practical lessons include, Fruit Critters, potato wedges, pizzas and bread, savoury or fruit crumble, fish goujons and bean burgers, stir fry noodles, scones.</p>	<p>Practical skills /Methods /Making Organisation /Use of time - Teacher, self</p> <p>peer assessment - Homework</p> <p>Results – sensory analysis – self assessment</p> <p>Skill Record / diary of what has been made</p> <p>Teacher assessment – plan of work</p> <p>Self evaluation, WWW/EBI extended writing</p> <p>End of rotation assessment</p>	<p>All new learning. Hygiene & safety ongoing- every lesson checks to support the independent safe working practices required at GCSE level.</p>

Year 8 (full term rotations)

When?	What we are Learning and Assessing e.g. Topics/ Skills etc	How we are Assessing e.g. Extended writing, Project, exam etc	Links Backwards and Forward When was it last covered & when next?
Graphics Technology Rotation	Research into past and present designers and their contribution to design, circles in isometric, design thinking skills and literacy. Design ideas and layout, digital editing of images, practical use of dye sublimation process to make a series of graphics based products such as packaging and novelty mugs.	Extended writing, geometrical drawing task, analysis of mood-board, specification. Design sheets and annotations, artwork production and complexity, completed mug. End of rotation assessment	Building on technical drawing skills, accuracy and application of colour and rendering techniques. Introduction to the design process in readiness for KS4 Design & Technology (research, investigate, plan, design, develop, make and evaluate)
Products Technology Rotation	Bling Box project. Design, make evaluate – understanding natural and manmade timbers and board to create a personalised trinket box that showcases a range of traditional woodwork skills and modern laser cutting technology.	Knowledge of tools, equipment materials and processes Accuracy of measuring and marking out CAD design Quality of practical outcome End of rotation assessment	Building on knowledge of material properties, understanding of manufacturing processes and developing making skills Introduction to the design process in readiness for KS4 Design & Technology (research, investigate, plan, design, develop, make and evaluate)
Engineering Technology Rotation	Situation and brief Reading engineering information Tools used in mechanical engineering Practice safety and accuracy of hand tools working to +/- 0.5% Using powered machines Using a design brief Design solutions CAD practice Coat hook and Spanner practical	Verbal Q&A on understanding Written responses Faculty STR (strength target response) Photographic and measuring evidence in books Faculty STR (strength target response) Peer assessment challenges understanding and encourages collaboration Self-assessment whether work meets the requirement outlined RAG (red, amber green skills assess) Team’s assignment with photo evidence and STR feedback Teams quiz on material taught over the term	Y7 brief on different item Y9 future brief on more complex item Drawings used throughout all engineering projects and assignments 7-11 Unit 1 (Y10/11) need to work to given standards Students use variety of machines in the past and future years to develop solutions Unit2 in Y11 students must use a brief to come up with their own solution CAD is an on-going skill which is used in all projects 7-11 Self-assessment skills transfer to future projects that use the same methods
Food Technology Rotation	Sources and functions of nutrients. Adapting recipes. Balanced diet. Adapting recipes for special diets. Science of sauce making to create a series of dishes. Practical lessons include, savoury rice, flapjacks, frittata, pizza wheels, turkey burger, Dutch apple cake, chicken fajitas,	Practical skills /Methods /Making Organisation /Use of time - Teacher, self, peer assessment – Homework. Results – sensory analysis – self assessment. Skill Record / diary of what has been made. Teacher assessment – plan of work. Self evaluation, WWW/EBI extended writing. End of rotation assessment	Building on Hygiene & Safety last done year 7, ongoing checks each lesson. Next covered in Y9 and option ks4 class. Practical dishes build on skills from year 7 with added complexity and independence.

Year 9

When?	What we are Learning and Assessing e.g. Topics/ Skills etc	How we are Assessing e.g. Extended writing, Project, exam etc	Links Backwards and Forward When was it last covered & when next?
Graphics Technology Rotation	CAD Architecture project	Digital CAD outcomes assessed through OneNote journal, geometrical CAD task, analysis of mood-board, specification. Design iterations and evaluations, digital artwork production and complexity, completed still shots of interior and exterior architectural elevations. End of rotation assessment	Developing digital creativity, Computer Aided Design skills required for GCSE Design & Technology
Products Technology Rotation	Animal Lamp project Design make and Evaluate an electronic product. Understanding electronic componentry, systems and control. Research – existing product and user analysis Planning – measuring and marking out materials ready for processing. Making – practical skills in cutting, filing smoothing, finishing, assembly, electronic soldering. Design – CAD skills for designing the animal head in 2D and manufacturing CAM laser cutting Evaluation – practical outcomes, quality, suitability of use, reflection. Extension – packaging design and make surface developments.	Knowledge of tools, equipment materials, processes and electronic componentry. Accuracy of measuring and marking out. Manufacture of a working electronic product. Quality of practical outcome End of rotation assessment covering key areas of learning, Research, Planning, Designing Making, Evaluation and Extension.	Developing key knowledge, and further advance skills and understanding of electronic components, Health & safety, tools, equipment machinery and manufacturing processes to promote the competent and safe independent use of machines required at GCSE level in D&T and construction when manufacturing projects and portfolio work pieces.
Engineering Technology Rotation	Understanding a situation and brief Taking information from engineering drawings Hand tools used Secondary machining techniques (turning) Machined features Following manufacture plans Finishing techniques Practical evaluation Maths used in engineering Electronic component, systems and design End point assessment	Verbal Q&A on understanding Written responses from drawing Written answers with STR marking RAG current targeted skills on machine Photo evidence using teams' assignment Written answers with STR marking Written answers with STR marking Self-assessment using RAG Written answers with STR marking Teams assignment using STR Teams quiz on material form the term.	Y7 and 8 brief on different item Y11 future brief given by the exam board Drawings used throughout all engineering projects and assignments 7-11 Unit 1 (Y10/11) need to work to given standards Using specialist tools that they select Students use variety of machines in the past and future years to develop solutions Unit2 in Y11 students must use a brief to come up with their own solution Self-assessment skills transfer to future projects that use the same methods Students will learn electronic systems for their unit 3 exam in Y11

When?	What we are Learning and Assessing e.g. Topics/ Skills etc	How we are Assessing e.g. Extended writing, Project, exam etc	Links Backwards and Forward When was it last covered & when next?
Food Technology Rotation	<p>Food safety skills. understand the principles of cleaning, preventing cross-contamination, chilling, cooking food thoroughly and reheating food until it is steaming hot.</p> <p>Practical lessons include, Bacon and mushroom risotto, RAGU sauce meat/veg option, Fake away chicken/vegetable masala dish, cottage/vegetable pie, Fake away burger, Food Science, recipe adaptation, seasonal dishes.</p>	<p>Practical skills /Methods /Making Organisation /Use of time - Teacher, self, peer assessment – Homework. Results – sensory analysis – self assessment. Skill Record / diary of what has been made. Teacher assessment – plan of work. Self evaluation, WWW/EBI extended writing. End of rotation assessment</p>	<p>Building on Hygiene & Safety last done year, ongoing checks each lesson. Working towards knowledge of dietary related illness causes and prevention. Next covered in option ks4 class. Practical dishes build up to high level skills from year 8 with added complexity and independence.</p>

Long Term Assessment Plan – Key Stage 4

Year 10 2023

When?	What we are Learning and Assessing e.g. Topics/ Skills etc	How we are Assessing e.g. Extended writing, Project, exam etc	Links Backwards and Forward When was it last covered & when next?
Autumn 1 Project	Shop front architecture project – Logos, branding and corporate identity. Graphic & technical drawing skills, paper and card engineering. Prototype modelling using scale and materials representation. CAD/3D modelling Resistant material prototype development. Time management, Tools, equipment, techniques and finishes, Surface treatments and finishes	Portfolio of developing sketch work and design skills, peer and teacher assessed. Investigate user needs and wants, Design, and prototype modelling. TEAMS assessment based on the submission of written and practical evidence. Portfolio of developing sketch work and design skills, peer and teacher assessed Quality practical outcomes, prototype paper and card models, Final iteration developed using resistant materials.	Building on KS3 graphic & technical drawing ability. Materials knowledge and understanding, practical skills application with the independent use of tools, equipment and machinery. Building on mathematic modelling skills and interpreting the use of data for computer aided design skills Preparing for the independent development of 3D modelling for NEA assessment and 21 st century design techniques.
Autumn 1 Theory	Unit 1 theory - New and Emerging Technologies, Industry and enterprise, Sustainability and the environment, People, culture and society, Production techniques and systems, Informing design decisions.	End of unit assessment test 40 minutes based on the retention of knowledge covering the details of this topic.	Building on knowledge and understanding of 21 st century technology. Preparing for KS4 Exam
Autumn 2 Project	Ergonomic pizza cutter project – understanding iterative design. <ul style="list-style-type: none"> • sketching • modelling • testing • evaluation of their work to improve outcomes 	Using ergonomic and anthropometric data to develop iterative prototypes in response to a given design brief	Building on knowledge of understanding user needs and wants. Preparing for responding to a given design scenario NEA and Exam.
Autumn 2 Theory	Unit 6 theory - Designing Principals, Investigation, primary and secondary data, The work of other companies and designers, Design strategies, Communication of design ideas.	End of unit assessment test 40 minutes based on the retention of knowledge covering the details of this topic.	Building on Formalisation of the design process and how we use it to fulfil a design brief. Preparing for Final KS4 NEA independent coursework project
Spring 1 Project	Memphis Clock Project - investigate, analyse and evaluate the work of past and present designers and companies to inform their own designing. <ul style="list-style-type: none"> • collaboration • user centered design • a systems approach 	Researching past and present designers. Understanding manufacturing processes. Mixed materials processing and assembly skills	Building on knowledge practical processing of mixed materials, wood, metal, plastic

When?	What we are Learning and Assessing e.g. Topics/ Skills etc	How we are Assessing e.g. Extended writing, Project, exam etc	Links Backwards and Forward When was it last covered & when next?
	<ul style="list-style-type: none"> • iterative design • avoiding design fixation. 		
Spring 1 Theory	Unit 7 theory - Making Principals, Selection of materials and components, Tolerances, Material.	End of unit assessment test 40 minutes based on the retention of knowledge covering the details of this topic.	Building on knowledge and understanding taught at KS3 science and technology. Preparing for application of knowledge for NEA and Exam.
Spring 2 Project	Angle poise lamp project -Understanding <ul style="list-style-type: none"> • prototype development • selection of materials and components • tolerances • material management • specialist tools and equipment • specialist techniques and processes. 	Design for 3 rd party manufacture. Development of CAD skills and CAM processing. Portfolio of developing sketch work and design skills, peer and teacher assessed	Building on the independent use of CAD skills and CAM processing. Preparing for responding to the independent development of a design prototype for NEA
Spring 2 Theory	Unit 2 theory - Energy, Materials, System and Devices, Energy generation and storage, Modern materials, Smart materials, Composite materials and technical textiles, Systems approach to designing, Electronic systems processing, Mechanical devices.	End of unit assessment test 40 minutes based on the retention of knowledge covering the details of this topic.	Building on knowledge and understanding taught at KS3 science and technology. Preparing for application of knowledge for NEA and Exam.
Summer 1 Project	Exam preparation and techniques. Multiple choice, short answer, long answer, design and annotation questions, maths.	Identify gaps in learning. Responses to directed improvement and reflection time.	This is the consolidation of all theory work learned up until this point. From here, students will prepare for the Design and technology pre-public examination.
Summer 1 Theory	Unit 4 theory - Common Specialist Techniques and principals, Forces and stresses, Improving functionality, Ecological and social footprint, The six Rs, Scales of production.	End of unit assessment test 40 minutes based on the retention of knowledge covering the details of this topic.	Building on knowledge and understanding taught at KS3 science and technology. Preparing for application of knowledge for NEA and Exam.
Summer 2 Project	NEA Task release. Investigation of contextual themes set by AQA	External assessment from exam board on a given theme	Put into practice all the skills knowledge and understanding developed throughout KS3 & KS4. Preparing students to independently address a 'live' project just as a designer would do in industry.
Summer 2 Theory	Unit 3 theory – Materials, Papers & Boards. Timbers. Metals and alloys. Polymers. Textiles	End of unit assessment test 40 minutes based on the retention of knowledge covering the details of this topic / External assessment from exam board	Building on knowledge and understanding taught at KS3 science and technology. Preparing for application of knowledge for NEA and Exam.

Year 11

When?	What we are Learning and Assessing e.g. Topics/ Skills etc	How we are Assessing e.g. Extended writing, Project, exam etc	Links Backwards and Forward When was it last covered & when next?
Autumn 1	<p>NEA pre release coursework task Stage 1 investigation and research</p> <p>By analysing the contextual challenge students will identify design possibilities, investigate client needs and wants and factors including economic and social challenges. Students should also use the work of others (past and/or present) to help them form ideas. Research should be concise and relate to their contextual challenge. Students are also advised to use a range of research techniques (primary/secondary) in order to draw accurate conclusions. Students should be encouraged to investigate throughout their project to help inform decisions.</p> <p>NEA Stage 2 Design brief and specification proposal Based on conclusions from their investigations students will outline design possibilities by producing a design brief and design specification. Students should review both throughout the project.</p>	External assessment from exam board on a given theme	<p>Utilising knowledge and understanding of the design process, materials and manufacturing.</p> <p>Building on the research phases and the development of specifications of KS3 Design & technology projects and home learning.</p> <p>Preparing for KS5 and further education investigation skill requirements in Design and technology courses or apprenticeships.</p>
Autumn 2	<p>NEA Stage 3 Generating design ideas</p> <p>Students should explore a range of possible ideas linking to the contextual challenge selected. These design ideas should demonstrate flair and originality and students are encouraged to take risks with their designs. Students may wish to use a variety of techniques to communicate. Students will not be awarded for the quantity of design ideas but how well their ideas address the contextual challenge selected. Students are encouraged to be imaginative in their approach by experimenting with different ideas and possibilities that avoid design fixation. In the highest band students are expected to show some innovation by generating ideas that are different to the work of the majority of their peers or demonstrate new ways of improving existing solutions.</p>	External assessment from exam board	<p>Utilising technical drawing and design skills.</p> <p>Building on the design phases of KS3 Design & technology projects and skills developed through visual communication.</p> <p>Preparing for KS5 and further education visual communication skill requirements in Design and technology courses or apprenticeships.</p>
Spring 1	<p>NEA Stage 4 Developing design proposals</p> <p>Students will develop and refine design ideas. This may include, formal and informal 2D/3D drawing including CAD, systems and schematic diagrams, models and schedules. Students will develop at least one model, however marks will be awarded for the suitability of the model(s) and not</p>	External assessment from exam board	<p>Utilising prototype modelling and 3D computer aided design skills.</p> <p>Building on the prototype development phases of KS3 Design & technology projects.</p>

When?	What we are Learning and Assessing e.g. Topics/ Skills etc	How we are Assessing e.g. Extended writing, Project, exam etc	Links Backwards and Forward When was it last covered & when next?
	the quantity produced. Students will also select suitable materials and components communicating their decisions throughout the development process. Students are encouraged to reflect on their developed ideas by looking at their requirements; including how their designs meet the design specification. Part of this work will then feed into the development of a manufacturing specification providing sufficient accurate information for third party manufacture, using a range of appropriate methods, such as measured drawings, control programs, circuit diagrams, patterns, cutting or parts lists.		Preparing for KS5 and further education iterative design strategy requirements in Design and technology courses or apprenticeships.
Spring 2	NEA Realising Design proposals Students will work with a range of appropriate materials/components to produce prototypes that are accurate and within close tolerances. This will involve using specialist tools and equipment, which may include hand tools, machines or CAM/CNC. The prototypes will be constructed through a range of techniques, which may involve shaping, fabrication, construction and assembly. The prototypes will have suitable finish with functional and aesthetic qualities, where appropriate. Students will be awarded marks for the quality of their prototype(s) and how it addresses the design brief and design specification based on a contextual challenge.	External assessment from exam board	Utilising the practical use of tools equipment, machinery and processes. Building on the practical 'make' phases of KS3 Design & technology projects. Preparing for KS5 and further education practical skill requirements in Design and technology courses or apprenticeships.
Summer 1	NEA Analysing and evaluation / Revision focus Within this iterative design process students are expected to continuously analyse and evaluate their work, using their decisions to improve outcomes. This should include defining requirements, analysing the design brief and specifications along with the testing and evaluating of ideas produced during the generation and development stages. Their final prototype(s) will also undergo a range of tests on which the final evaluation will be formulated. This should include market testing and a detailed analysis of the prototype(s).	External assessment from exam board	Utilising analytical, testing and evaluative methods. Building on the evaluation, self, and peer assessment phases of KS3 Design & technology projects. Preparing for KS5 and further education reflective and evaluative designer requirements in Design and technology courses or apprenticeships.

Key Stage 4 Examination Overview

Exam Board Details: AQA GCSE (9-1) Design and Technology

50% NEA Coursework

50% Exam

What resources could I buy or borrow that will help my child?

Practice exam papers PG Online

Students theory work from 9-11

What are the key websites or Apps that my child could use?

Technologystudent.co.uk

What can I do to encourage my child to take a further interest in Design and Technology?

Watch programmes such as Grand Designs

Subscribe to design museum/RSA

'How it's made' magazine

What after school or other extracurricular activities are available in Design and Technology and when are they?

Make it club

Robotics club

Coursework support club