



Curriculum Guide for Design Technology

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1. Curriculum Rationale

2. What students will learn in Design Technology

INTENT

Design and Technology at Granville Academy aims to inspire and motivate students through a demanding, stimulating and innovative curriculum. The knowledge and skills gained through the experiences within a wide variety of materials including Food, Product Design, Textiles, Graphics and CAD/CAM embeds the concept that design is all around us and that design is for all. Within the Faculty, through careful mapping, students build core, transferable knowledge and skills which will ultimately prepare them for employment in the 21st century.

The curriculum we offer at Granville reflects the requirements of the National curriculum: Design and Technology is 'an inspiring, rigorous and practical subject'. Students use their imagination and creativity to design and make products that 'solve real and relevant problems' through a variety of contexts. Students consider the needs of others considering values, culture and the well-being of the nation. Students study a broad range of subject knowledge and through this will learn to apply knowledge from other areas such as 'mathematics, science, engineering and computing'. Design and Technology here at the Academy encourages students to take risks, become resourceful, innovative and enterprising members of society. The curriculum, designed by the Design & Technology Faculty, ensures that all learners, particularly the most disadvantaged and those with special educational needs and/or disabilities (SEND) follow a curriculum that gives students the knowledge and cultural capital they need to succeed in life. Within the Faculty, students develop a wealth of transferable skills through an iterative approach to learning.

Aims and Objectives of Design and Technology:

- Develop awareness/ need for Health and Safety.
- Develop an understanding of food hygiene issues.
- Develop problem solving/ thinking skills.
- Develop communication skills.
- Develop social skills (independent and co-operative).
- Extend existing/ new practical skills.
- Learn and use appropriate technological vocabulary.
- To be aware of technology in its wider contexts.
- Develop skills to compliment other curriculum areas (Numeracy, Literacy, etc).
- Develop self worth/ esteem.
- Produce quality outcomes.
- ***To realise learning can be fun!***
- ***To see what they can achieve!***

SEND

Multi-sensory learning: Incorporating visual, auditory, and tactile learning into the lesson helps students with SEND to better understand the concepts. Using videos, pictures, and hands-on activities to explain the different stages of the design process. Modelling the practical elements is an essential element that supports our SEND students

Differentiated instruction: Providing different levels of instruction and activities based on the students' individual abilities and learning styles helps to ensure that everyone can access the curriculum. This involves providing simplified or modified instructions, chunking down the information or providing additional support through visual aids or written instructions.

Use of technology: Assistive technology can be a powerful tool to support students with SEND. For example, using text-to-speech software on the iPad, digital images, or screen readers can help students to access information more easily. Similarly, using 3D printing or computer-aided design (CAD) software can allow students to create prototypes of their designs, which can help to build their confidence and understanding.

Collaborative learning: Group is an effective way to help students with SEND to develop their social skills, communication skills, and confidence. Working in groups can also provide an opportunity for students to learn from one another and to share their ideas and perspectives. Cooperating with their peers in sharing equipment and the mutual respect this encourages develops them as citizens of the world.

Encouraging verbal skills by asking students to talk about/ demonstrate aspects of their design and technology work to the rest of the class, or partner helps to build their self-esteem. Increased think time is another strategy that allows student to processing and encourage response.

Positive reinforcement: We believe that it is important to recognise and celebrate the achievements of students with SEND, no matter how small they may seem. This can help to build their confidence and motivation to continue learning. Additionally, providing specific and constructive feedback will help our students to understand their strengths and areas for improvement, and to develop strategies for improving their work.

In Granville Academy Technology Faculty, it is important to be flexible and adaptable when teaching Design Technology to students with SEND. By using a variety of teaching strategies and techniques, and tailoring them to each student's individual needs, we can try to ensure that everyone can access and enjoy the subject. Knowing the students and their needs and sharing information with support staff is a vital component. This done by using the seating plan to help target support.

IMPLEMENTATION

The sequence of teaching and assessment is planned to ensure that there is progression. Across all key stages students are taught to develop their analytical, designing, making and evaluative skills. These skills are delivered through 12 week units of work.

At Key Stage 3, students have key assessed pieces to ensure continuity in teaching and learning across all groups. This is detailed for each module and can be found in the Faculty Curriculum folder. Retrieval exercises are built in to the delivery of modules to ensure students re-visit key knowledge and skills at regular intervals thus securing retention of knowledge.

Key Stage 4 subjects continue to extend knowledge and learning with the ultimate goal of equipping students with a plethora of transferable skills that will equip them for their future role in society.

Impact

Students will develop detailed knowledge throughout each Key Stage frequently embracing retrieval activities which ensure students are successful and ready for the next stage of their education, employment or training.

Formal assessment will take place 3 times a year. These grades will be reported to parents through the schools reporting system. It will consist at KS3 with 6 pieces of assessed work covering the key principles of Design Technology; Evaluating, Designing, Making Skills and Technical Knowledge.

KS4:

At Key Stage 4 students have the choice of specialising in GCSE Design Technology, OCR Cambridge National in Engineering Manufacture, GCSE Food and Nutrition or GCSE Fashion and Textiles

- AQA GCSE Design and Technology, 50% Non-Examination content, 50% External Examination
- AQA Food Preparation and Nutrition, 50% Non-Examination content, 50% External Examination
- OCR Cambridge National in Engineering Manufacture, 60% Non-Examination content, 40% External Examination
- OCR GCSE Fashion and Textiles



3. Curriculum Map Key Stage 3



The de Ferrers Trust Design and Technology - Key Stage 3 Curriculum

Key Stage 3 Units of Study

	Year 7	Year 8	Year 9
The Design Process			
Research/ Analysis	Bauhaus Pencil Case (Textiles)	Nutrition Mission (Food)	
Design & Development	Flexi Fish (Resistant Materials) Skill Up (Graphics)	Culture Cushion (Textiles) Isometric (Graphics)	CAD/CAM (Resistant Materials) Time to read (Graphics)
Planning & Manufacture	Bug Hut (Resistant Materials) Promotional Desk Tidy (Graphics)	Passive Amp (Resistant Materials) Pewter Pendent (Resistant Materials)	Mood light (Resistant Materials) Food Packaging(Graphics)
Testing		Chocolate box (Graphics/Product Design)	Food Science (Food)
Evaluation	Food Nutrition and Origins		Eco Boot Bag (Textiles)

At key Stage 3, students cover 6 units in each year.

Each unit has an assessed piece of work marked out of 25 and a topic knowledge assessment marked out of 25. This is line with our Academy Trust plan.

The specialisms are delivered in sequence within the carousel nature of the curriculum.

Curriculum Map Key Stage 4

Design Technology

Term	Year 10 – GCSE	Year 11 – GCSE
1	<p>3.1 Core technical principles</p> <p>In order to make effective design choices students will need a breadth of core technical knowledge and understanding that consists of:</p> <ul style="list-style-type: none"> • new and emerging technologies • energy generation and storage • developments in new materials 	<p>It's intended to be an iterative process so the learning activities will be directed by the student and will depend on their project</p> <p>Design Brief Design Specification</p> <p>Initial Design ideas</p> <p>Development of Design ideas.</p>
2		<p>Development of Design ideas</p> <p>Modelling</p>
3	<p>3.2 Specialist technical principles</p> <p>In addition to the core technical principles, all students should develop an in-depth knowledge and understanding of the following specialist technical principles:</p> <ul style="list-style-type: none"> • selection of materials or components • forces and stresses • ecological and social footprint • sources and origins 	<p>Mock Examination Preparation</p> <p>Testing of Materials</p> <p>Manufacturing Specification</p> <p>CAD</p> <p>Working Drawings</p>
4		<p>Manufacture of final product</p> <p>Evaluation and testing of final Product</p>

	<p>Not all of the principles outlined above relate to every material category or system, but all must be taught.</p> <p>The categories through which the principles can be delivered are:</p> <ul style="list-style-type: none"> • papers and boards • timber based materials • metal based materials • polymers • textile based materials • electronic and mechanical systems 	<p>Coursework deadline</p> <p>17th Feb 2023</p>
5	<p>3.3 Designing and making principles</p> <p>Students should know and understand that all design and technology activities take place within a wide range of contexts. They should also understand how the prototypes they develop must satisfy wants or needs and be fit for their intended use. For example, the home, school, work or leisure.</p>	Revision begins for Examination
6	<p>They will need to demonstrate and apply knowledge and understanding of designing and making principles in relation to the following areas:</p> <ul style="list-style-type: none"> • investigation, primary and secondary data • environmental, social and economic challenge • the work of others • design strategies • communication of design ideas • prototype development • selection of materials and components • tolerances • material management • specialist tools and equipment • specialist techniques and processes <p>AQA NEA release in June. This to be delivered alongside with Pupils completing work over the Summer Holidays.</p>	

Cambridge National in Engineering Manufacture (J823)

Term	Year 10 – GCSE	Year 11 – GCSE
1	R014: Reading engineering drawings R015: Interpreting engineering drawing in preparation for manufacture	R014: Scales of manufacture R016: Preparing for scale manufacture R016: NEA Assessment (working on)
2	R014: Engineering materials R015: Planning for manufacture/risk assessment	R014: Quality R016: CAD/CAM programming R016: NEA Assessment (working on)
3	R014: Manufacturing processes R015: Workshop practice – marking out and using tools/equipment	R014: Inventory management/Lean Manufacturing R015: NEA Assessment (resubmit for moderation) ¹ R016: NEA Assessment (submit for moderation) R014: Examination (early opportunity)
4	R014: Manufacturing processes R015: Workshop practice/NEA Assessment (working on)	R014: Globalisation R016: CNC Setup and operation R016: Quality control activities
5	R014: Manufacturing processes R015: Workshop practice/NEA Assessment (working on)	R014: Revision of topic areas/exam revision R014: Examination (final opportunity) R016: CNC Setup and operation (continues) R016: Quality control activities (continues) R016: NEA Assessment (submit for moderation)

6	R015: NEA Assessment (submit for moderation) ²	
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Food and Nutrition

Term	Year 10 – GCSE	Year 11 – GCSE
1	<u>3.2 Food Nutrition and Health:</u> Macronutrients (Fats, Protein, Carbohydrates) Micronutrients (Vitamins Minerals) Nutritional needs and health Energy needs Nutritional Analysis Diet, nutrition and health	<u>Coursework component NEA 1</u> Students carry out research into the ingredients to be investigated. The research will demonstrate how ingredients work and why. The outcome of the research should clearly inform the nature of the practical investigation and be used to establish a hypothesis or prediction for the food investigation task. Introduction to NEA 1 Food Investigation task Section A (2 hours) Section B (3 hours) <u>Recap Practical Skills</u> Bread Making Pastry Making
2	<u>3.3 Food Science</u> Cooking of food and heat transfer Selecting appropriate cooking methods Functional and chemical properties of foods Carbohydrates Fats and Oils Fruit and vegetables Raising Agents	<u>Coursework Component NEA 1</u> Section C (3 hours) <u>10 hours max/1500-2000 words</u> <u>Coursework Component NEA 2</u> In this task, students will prepare, cook and present a final menu of three dishes to meet the needs of a specific context. Students must select appropriate technical skills and processes and create 3–4 dishes to showcase their skills. They will then produce their final menu within a single period of no more than 3 hours, planning in advance how this will be achieved. Introduction to NEA 2 Researching the task (3 hours) Demonstrating technical skills (3 hours) <u>Recap Practical Skills</u> Pasta Making
3	<u>3.4 Food Safety</u> Food spoilage and contamination Microorganisms and enzymes The signs of food spoilage Microorganisms and food production Bacterial contamination Principles of food safety	<u>Coursework Component NEA 2</u> Planning for final menu (3 hours) Making final dishes (3 hour practical exam) <u>Mock Exam Preparation</u> <u>Knowledge Recap – 1 hour a week</u>

	Buying and storing food Preparing cooking and serving food	
4	<u>3.5 Food Choice</u> Factors affecting food choice Food choices Food labelling and marketing influences British and international cuisines Sensory evaluation	<u>Coursework Component NEA 2</u> Analyse and evaluate (3 hours) End of NEA 2 20 hours max including practical exam (not to exceed 20 pages sides of A4) (3 hours contingency) <u>DEADLINE MARCH</u> <u>Exam Revision</u>
5	<u>3.6 Food Provenance</u> Food Sources Food and the environment Sustainability of food Food processing and production Food production Technological developments associated with better health and food production	<u>Exam Revision</u> Revision begins <u>Recap knowledge</u> Food Nutrition and health Food Science Food Safety Food Choice Food Provenance
6	<u>Revision</u> Mock Exam June Mock NEA 1 Recap of Macronutrients/Micronutrients 3 hour NEA 2 Practical Mock	<u>Revision</u> Continuation of revision <u>EXAM</u> <u>Study Leave</u>

GCSE Fashion and Textiles

Term	Year 10 – GCSE	Year 11 – GCSE
1	<p style="text-align: center;"><u>Portfolio work – Fashioned by Nature</u></p> <p>A01- Develop ideas through investigations, demonstrating critical understanding of sources</p> <p>Understand cultural influences and trends related to fashion and textiles (past and present)</p> <p>Identifying sub cultures that interweave with each other to achieve a creative bigger picture.</p> <ul style="list-style-type: none"> • Cultural mood board • Keyword analysis • Personal statement • Designer timeline 	<p style="text-align: center;"><u>Externally set task (OCR paper released Dec)</u></p> <p>02: Externally set task</p> <p>The early release paper will be issued on 2 January each year and will provide learners with five themes, each with a range of written and visual starting points and stimuli. A response should be based on one of these options.</p> <p>Exam preparation given</p> <p>Exam time 10 hrs and 80 marks internally assessed and externally moderated.</p>

2	<p>A02 – Creative making, refine work by exploring ideas, selecting and experimenting with appropriate media, techniques and processes.</p> <p>Explore the importance of pattern and texture that reflects nature through surface decoration.</p> <p>Exploring primary and secondary evidence related</p> <p>Photographic observations of nature</p> <p>Observation drawings</p> <p>Mono and lino printing, Dye sublimation of various repeat patterns explored</p> <p>Mark making through embroidery.</p> <p>2D & 3D fabric manipulation through appliques, beading and machine techniques</p> <p>Analysing key contemporary designers and artists that are influenced by nature x 3</p> <p>In depth written analysis of a chosen designer work exploring their creative techniques through sampling.</p>	
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4. Assessment Plan

KS3

At key Stage 3, students cover 6 units in each year.

Each unit has an assessed piece of work marked out of 25 and a topic knowledge assessment marked out of 25.

This is line with our Academy Trust plan.

The specialisms are delivered in sequence within the carousel nature of the curriculum.

KS4

Students undertake Unit Assessments, as well as end of year cross trust assessments.

5. Specialist Vocabulary

	Year 7	Year 8	Year 9	Year 10	Year 11
1	Design	Design	Isometric	Adhesive	Photo Chromic
2	Specification	Specification	Orthographic	Aesthetics	Nanotechnology
3	Annotation	Development Net	Project	Alloy	Polymorph
4	Evaluate	Vacuum Forming	Dimensions	Analyse	Thermochromic
5	Computer Aided Design	Computer Aided Design	Elevation	Ergonomics	Reduce
6	Computer Aided Manufacture	Computer Aided Manufacture	Finishes	Innovate	Rethink
7	Analysis	Analysis	Quality	Lithography	Refuse
10	Acrylic	Acrylic	Tolerance	Manufacture	Life Cycle Analysis
11	Medium Density Fibreboard	Medium Density Fibreboard	Soldering	Sustainability	Planned Obsolescence
12	Tenon saw	Tenon saw	Joint	Finite	Specification
13	Coping Saw	High Impact Polystyrene	Pine	Infinite	Evaluation
14	Steel ruler	Steel ruler	Sustainability	Anthropometrics	
15	Try Square	Try Square	Recycle	Just In Time (JIT)	

Key Words are emphasised at the start of the lesson in the Do Now and Review Now.

Understanding of keys words is reinforced by recaps of previous learning.

Students are encouraged to use the words in the annotation of their work and evaluations

Knowledge organisers can be found here: <http://www.deferrerstrust.com/knowledgeorganisers>

6. Cultural Capital

Cultural Capital is embedded in the Design Technology Curriculum at both KS3 and KS4. The issue of Sustainability is a key principle at the core of the curriculum. The potential impact that products have on the environment and the design principles that are considered in the manufacture of a products and materials is thoroughly explored. The needs and requirements of the users also means that different cultures and environments are explored throughout the curriculum.

7. Homework and independent learning

Homework and the regularity can be dependent on the topic at KS3, but often it will consist of students gathering sources of information in order to further the design process, or exploring the world of design by analysing the work of others or existing trends. The knowledge Organisers are also used to embed key terminology.

By getting the students to invest in their learning outside of school enable them to have a more developed understanding of the projects

In food technology, often Homework is ensuring that ingredients are purchased and correctly measured and weighed.

KS4 homework will be set alternate weeks depending on wah ration column they are in.

Recommended websites:

<http://www.technologystudent.com/>

<https://www.bbc.com/bitesize/subjects/zvg4d2p>

<http://www.mr-dt.com/>

Seneca learning assignments

There are many opportunities for students to extend their experiences by attending regular extra-curricular activities.

Textiles Club

CAD Club

Baking Club

Rocket Car Club

Beyond the Classroom

How parents and carers can Help

Each year, at KS3 a voluntary contribution is requested to pay for materials and some of the consumables. This is communicated via the schools newsletter.

Students are expected to provide some ingredients/materials themselves in order to make quality products from their own designs. Parents can provide important support by encouraging students to select and obtain materials/ingredients promptly to avoid any unnecessary delay.

Spare materials are welcomed by the various departments. Items such as wood, paper, fabric, threads, recipe books, etc. would be gratefully received.

Liaison with parents is valued. Please contact subject staff by telephone, e-mail or a note in the pupil planner to discuss any issues which may arise.

Securing Success

Students are offered guidance and practical help within the classroom. They are both supported and challenged to extend their performance. A combination of individual, pair, small groups and whole class arrangements are planned and the learning opportunities are varied: practical's; demonstrations; discussions; written tasks, video clips. It is important that students develop confidence and independence in their approach over time.