Purpose of Study

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.

Aims

The national curriculum for design and technology aims 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.

Students should have an understanding of how design can impact on their lives in the future and now.
Students should have an understanding of working together and make informed choices within the design process.
Students should reflect on their work and the work of others.
Students should have some idea on how to generate and communicate ideas.
Students also need to have some understanding of their choices as consumers.
Students should have the skills, confidence and resilience to use the tools and equipment of design rooms and work independently and safely, so that they can develop a range of design skills and apply them to create prototypes, just like a designer.
Students need to be prepared for the next stage of their lives. They are taught valuable life skills.

Hours of Study (1 lesson = 1 hour)

Year (total in year group)	Hours per two-week cycle	Hours per year (40 weeks)	Number of students
7 (176)	2	32 hours 16 weeks	180
8 (187)	2	32 hours 16 weeks	210
9 (193)	1	12 hours 12weeks	58
10 (192)	4	160 hours	58
11 (202)	4	160 hours	51

Timetabling and Setting Notes

Year 7 and 8 students have one lesson a week of Food and DT for 3 terms for each subject.
There are currently 7 groups of year 9 students studying DT, and they have one lesson a fortnight
There are currently 3 groups of year 10 students studying DT,
There are currently 3 groups of year 11 students studying DT,

Year 9 Options Notes

DT is one of the 'Open Bucket' subjects and was offered in one option block out of 4.

Programmes of Study

Terms	Year 7	Year 8	Year 9
1	Introduction to design Core knowledge test **Textiles – Ugly Monsters** Health and safety **Focus is on textiles** – from fibres to fabrics Sustainability How to manipulate fabric Importance of designers and design	**Sweet Dispenser Project** This project covers basic technical drawing and graphics skills in addition to practical woodwork skills in the workshop. One-Point and Two-Point Perspective Rendering Typography	Introduction to design Core knowledge test **Clocks inspired by iconic designers** What is design technology and why do we need it? What is iconic design? Iconic designers - work of designers Designer research of chosen designer

	Applique hand and machine embroidery Assemble of product Evaluation of products	Core Knowledge Test (Checkpoint Assessment)	Rei Kawakubo Yinka Ilori Coco Chanel Norman Foster William Morris Morag Myerscough
2	Using tools and equipment practical designer - sewing machine, scissors, pins and needles Practical assessment - fabric monster	Designer Research (Morag Myerscough) Mood Boards/Mind Maps Product Research Evaluation and Analysis of Existing Products Properties of Wood Sustainability	Health and Safety Mechanisms Acrylic / metal / wood Focus on 2D/3D - Drawing CAD / CAM Using specialist tools and Equipment Pillar drill, mortice, industrial sander, hole punch, vacuum forming
3	Food	Health and Safety in the Workshop Practical Skills/Equipment/Machines: Tenon Saw, Try Square, Pillar Drill, Sandpaper, Mortice, Metal Sheet Punch, Hammer, Screwdriver. Designing a Product Label. Evaluation of Final Product.	Assemble of product Manufacturing Evaluation of product
4	Food	Food	
5	Food	Food	
6	Food	Food	

Terms	Year 10	Year 11
1	**Subject Content** GCSE Design and Technology specification sets out the knowledge, understanding and skills required to undertake the iterative design process of exploring, creating, and evaluating. Most of the specification should be delivered through the practical application of this knowledge and understanding. Topics and themes have been grouped together in order to study the subject The content has been split into three sections as follows: • Core technical principles • Specialist technical principles • Designing and making principles Core technical principles covers core technical principles and all content will be studied. Specialist technical principles covers specialist technical principles where students will go into greater depth. Each principle will be studied through at least **one** material category or system. Designing and making principles covers design and making principles and all content in this section must be studied. Students will study and demonstrate mathematical and scientific knowledge and understanding, in relation to design and technology.	NEA – Non examined assessment / Revision

	<u>Design and Practical task involve</u> Assessment criteria: • Identifying and investigating design possibilities • Producing a design brief and specification • Generating design ideas • Developing design ideas • Realising design ideas • Analysing & evaluating **<u>Design and Make Task 1</u>** **Lamps inspired by Memphis** What is design technology and why do we need it? What is iconic design? Iconic designers - work of designers and movements **Ettore Sottsass and the design movement Memphis** **Work using specialist materials –** timber, paper & boards, metal, acrylics, textiles and electronics. **Core Technical Principles** Student will know and understand: • new and emerging technologies • energy generation and storage • developments in new materials • systems approach to designing • mechanical devices	

	• materials and their working properties **Students will know and understand of the main categories and types of natural and manufactured timbers:** **hardwoods including:** • ash • beech • mahogany • oak • balsa softwoods including: • larch • pine • spruce manufactured boards including: • medium density fibreboard (MDF) • plywood • chipboard	
2	**Students know and understand the main categories and types of papers and boards:** papers including: • bleed proof • cartridge paper • grid • layout paper	NEA- Non examined assessment /Revision

	• tracing paper boards including: • corrugated card • duplex board • foil lined board • foam core board • ink jet card • solid white board.	
3	**<u>Design and Practical task involve</u>** Assessment criteria: • Identifying and investigating design possibilities • Producing a design brief and specification • Generating design ideas • Developing design ideas • Realising design ideas • Analysing & evaluating **<u>Design and Make Task 2</u>** **Recycled fashion** **Sustainability of fabrics** **6RS** **Smart Materials**	NEA- Non examined assessment / Revision

	Work using specialist materials – timber, paper & boards, metal, acrylics, textiles and electronics. **Students should know and understand the main categories and types of textiles:** • natural fibres, including cotton, wool and silk • synthetic fibres, including polyester, polyamide (nylon) and elastane (Lycra) • blended and mixed fibres, including cotton/polyester • woven, including plain weave • non-woven, including bonded fabrics and felted fabrics knitted textiles including knitted fabrics **Students should know and understand the main categories and types of metals and alloys:** ferrous metals including: • low carbon steel • cast Iron • high carbon/tool steel non-ferrous metals including: • aluminium • copper	

	• tin • zinc alloys including: • brass • stainless steel • high speed steel.	
4	**Students should know and understand the main categories and types of polymers:** thermoforming including: • acrylic (PMMA) • high impact polystyrene (HIPS • high density polythene (HDPE) • polypropylene (PP) • polyvinyl chloride (PVC) • polyethylene terephthalate (PET) thermosetting including: • epoxy resin (ER) • melamine-formaldehyde (MF) • phenol formaldehyde (PF) • polyester resin (PR) • urea–formaldehyde (UF)	Revision
5	**Students should know and understand the main categories and types of metals and alloys:**	Revision

	ferrous metals including: • low carbon steel • cast Iron • high carbon/tool steel non-ferrous metals including: • aluminium • copper • tin • zinc alloys including: • brass • stainless steel • high speed steel.	
6	**NEA – Non examined assessment** **Substantial design and make task: contextual challenges provided by the examining board** **Assessment criteria:** o Identifying and investigating design possibilities o Producing a design brief and specification o Generating design ideas o Developing design ideas o Realising design ideas	

	o Analysing & evaluating	

Powerful Core Knowledge

How we identify powerful core subject knowledge

The most powerful core knowledge for design technology is to be able to develop key skills that can be refined over time through the practice of different materials and iterative experimentation. Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of domestic and local contexts [for example, the home, health, leisure and culture], and industrial contexts [for example, engineering, manufacturing, construction, food, energy, agriculture (including horticulture) and fashion]

Students need to have a good understanding of design the design of others and the importance of material and choice. The power of core knowledge in design is vital for them to be able to design make and evaluate and to understand that it is not just the design that is embedded in their mind before they start to think and work like a designer. They need to understand the whole design process and to be able to not just be fixed and develop their intuition like a designer.

How we sequence topics to create a logical, coherent, narrative.

At KS3 Students study a range designer from different eras linked to art and design movements in history.
Students develop these skills by using them in different projects throughout KS3 to enhance their knowledge, understanding and refinement of the basic skills.
At KS3 we need to start with the basics. Some students have never experienced any practical lessons. We need to build on confidence for these students and create a safe and comfortable environment for them to build on their confidence, as well as develop the skills of more experienced students who design and made items at home.

It is vital that at the end of KS 3 students are able to design make a product using a variety of materials using the iterative process of designing and making.

Retention

How we secure mastery (long term retention) of powerful core knowledge

We follow the school approach of learn, practice, test (LPT)
Each topic is accompanied by a knowledge organiser with the powerful core knowledge and vocabulary included.
As the topic is taught students complete an end of topic assessment to review their skills-based knowledge. A final piece is reviewed by the teacher and developed using feedback and visual guidance.
At the start of the year students take a core knowledge test and if they don't get 80%, they take it again until they do.
Core knowledge tests are organised so that prior knowledge is revisited and reinforced, so that by the end of year 9, the whole of KS3 is being tested.

Vocabulary and Spelling

How we secure mastery of specialist academic vocabulary (T3 words)

The specialist academic vocabulary for each topic (tier 3 words) is given in knowledge organisers.
This is taught explicitly in the context of each topic and tested through in the assessment of academic essays and reading for meaning tests.
Students that do not understand or use the terms correctly are required to learn them again and construct sentences that use them correctly.
Teachers emphasise the importance of specialist vocabulary in lessons using a practice system where students research and debate the meaning of words.
Core knowledge tests require students to explain specialist vocabulary.

How we secure mastery of vocabulary comprehension (T3 words in context)

Vocabulary tables in knowledge organisers, break words down into prefixes and suffixes and explain their morphology and etymology. Examples are also given of how they can be used in actual sentences.

Reading for meaning tests are set regularly to test students understanding of specialist vocabulary in context.

How we secure mastery of spelling (T3 words)

Vocab tables use morphology to break words down and help students to recognise patterns in their spelling. Etymology helps them to understand common roots.

The spelling of specialist vocabulary is tested at the end of core knowledge tests.

Academic Writing

How we define writing about design

Writing in design comes in different forms such as annotation, research and analysis of your own work and work of others. The SEMI (subject, elements, media and intentions) analysis is used to write detailed opinions about artists work and your own art.
We teach this format and students are expected to apply it when in their academic essays. In design, academic essays are not essays in the classics sense, they are written information about the work in depth including opinions and factual research. Students are taught to be use correct terminology, references and key words.

How we teach academic writing in design technology

We start with basic terminology in design and explore the words in practice. Specific vocabulary is discussed, and students are taught the meaning and context of the subject.

Teachers often model the correct words when discussing topics in lessons. Classroom presentations include vocabulary and how to write correct sentence structure when reviewing designers and artists work.

In the academic essay, they receive marks for format and terminology as well as knowledge and understanding.

Students are required to draft their essay/analysis at home with the assistance of a writing frame before writing it out in class, under timed conditions. This is to emphasise the importance of careful preparation and attention to detail. Following feedback, students may then be required to rewrite a paragraph to an improved standard.

Independent Learning (Prep)

Regularity

Year	Frequency	Hours per week or term	Main form or types
7	Design Technology is a 'open' subject so regular prep is set. However, prep is set in advance of core knowledge tests, spelling tests and academic essays.	1 hour per week on a 10-week rotation	Extension tasks form previous lesson. Revision from knowledge organisers and drafted academic essays.

8	Design Technology is a 'open' subject so regular prep is set. However, prep is set in advance of core knowledge tests, spelling tests and academic essays.	1 hour per week on a 10-week rotation	Extension tasks from previous lesson. Revision from knowledge organisers and drafted academic essays.
9	Prep is set every fortnight	1-2 hours per fortnight on a 6 term	Extension tasks form previous lesson. Revision from knowledge organisers and drafted academic essays. These are longer and more advanced than in year 8 and 9 so more time is required.
10	GSCE Design Technology – one piece a week, though this may vary.	6 hours per 6-week term.	Extension design work from previous lesson Core knowledge Researching Wider reading. Revision for tests and exams.
11	GSCE Design Technology – one piece a week, though this may vary.	6 hours per 6-week term.	Extension design work from previous lesson Core knowledge Researching Wider reading. Revision for tests and exams.

Assessment

How we assess progress at KS3

Progress is assessed by the following

Core knowledge tests
Spelling tests
Reading for Meaning tests
Academic essays

In year 7 and 8, students are also assessed as being below, in line or above age expected progress, as defined by their baseline.
In year 9 students are also given a SAGE grade (Scholastic Excellence, Advanced, Good, Emerging).

This information is reported to parents three times a year in progress reports and further explained at parents' evenings.

How we assess progress at KS4

Progress is assessed by the following

Exams
Class based assignments
Prep
End of topic tests
GCSE grading is used to calculate current working grades (CWG) and projected performance grades (PPG).

Teaching and Learning

How we teach to the top

Explanations are targeted at the top 20% of the class while resources are provided to ensure that others receive the scaffolding, they need to reach that level. Targeted questioning is used to check the understanding of current middle and lower ability students and whole class feedback includes reminders of basic knowledge, concepts and vocabulary. This means we usually take a 'no hands' approach to questioning to avoid currently more able students giving a false impression of the general level of understanding of the class.

The mastery approach means no student is left behind and our expectation is that all 'students can', including those with SEND and disadvantage students. Adaptations to resources and bespoke further assistance is provided for SEND students where necessary.

We also celebrate intellectual curiosity, never talk down our own knowledge nor make a virtue of our ignorance. We never use terms like 'gifted and talented', instead attributing progress to effort and deliberate practice and we never stigmatise achievement by using words like nerd, boffin or swot.

From a skills point, students are encouraged to find their strengths early on at ks3 and build on this each year. We aim to nurture their developing ability and guide them to reach their full potential.

How we ensure topics are introduced with direct instruction

For each topic we start big and go small. In other words, the teacher establishes the big picture before moving on to detail, examples and case studies. Powerful core knowledge is essential to establish an overall framework for each topic in archaeology, in other words the *most fundamental* knowledge, concepts and vocabulary. This is not introduced obliquely or via a case study, it is taught at the start of the topic and reinforced regularly after. As a topic progresses, opportunities are provided for application, experimentation, discussion, and further consideration.

Cultural Capital

How we develop cultural capital

A knowledge of artists and designers throughout different movements is a powerful knowledge to have when referencing specific styles and techniques. It can help with research, Identifying and investigating design possibilities. From producing a design brief and specification, generating design ideas, developing design ideas, realising design ideas, and analysing & evaluating Visual access to the original design works can be difficult and as a school we recognise the importance of visits/day trips to see art galleries and museums for research and understanding of design movements and museums and visiting galleries or jaguar educational design centres. We organise several visits to support the acquisition of cultural capital, for example an annual year 9 trip to the design museum, Tate Gallery and organise specialist career workshops. Encourage student to enter local and country wide art and design competitions

SEND

At Casterton College, our intention for Special Educational Needs and/or Disabilities (SEND) is to ensure that all children receive a High-quality and ambitious education regardless of need or disability. Every teacher at Casterton College is a teacher of SEND. We believe that all students should be equally valued in college and strive to provide an environment where all students can flourish and feel safe.

In the classroom a child with SEND may will:

- Receive a level of challenge suitable for their ability and needs.
- Have reasonable adjustments in place to help overcome their barriers to learning.
- Experience lessons which contain appropriate scaffolding and task modelling.
- Extra support may be given during practical lessons.

KS3 Design – Checkpoints, Key Assessment and other assessments

Which assessment	How often?	What is the focus of the assessment?	What will it be measured on?	Communication to parents and students	Will resources be provided to help students prepare?
Checkpoint	Over the course of the year: Year 9 – 1 Year 8 – 1 Year 7 - 1	Mixture of knowledge and skills	1. Core knowledge test at the beginning and end revised as a prep and completed in class 2. General classwork 3. Any completed academic essays/ presentations or reading for meanings or core knowledge tests	1. Set on Edu link 2. N/A 3. Draft for academic essay /presentation spellings for core knowledge test	1. Design Prep set in Booklet provided – digital copy also on edulink each time set 2. N/A 3. Academic essay/ presentation guidance PowerPoint – spelling prep in design booklet.
Key Assessment	Once in all year	Design and Make skills	Designing skills dependant of study area Practical skills, dependant if study areas Students will build up their skills, knowledge and confidence and they will be assessed on their final product.	Students will be informed that this will be a part of their assessment. Set on Edu link.	Classwork Key words and definitions
Academic Essay/ Presentation	1 in each year the year	Knowledge and skills	Designer analysis of a designer and their work Presentation of their work	Set on edulink – with the help and support of powerpoint resources.	Academic essay guidance of how to prep for essay / presentation.
Reading for meaning test	1 in each year	Knowledge and skills	On the work of a designer anaylsis	No preparation required as it's based on comprehension. Students will complete them in the lesson. Students do not need to prepare for it	General classwork.

Core Knowledge Test	1 in each year	Knowledge	Based on the basic knowledge and understanding of design subject dependant on what they are studying	No revision required Spellings and key words in the design booklet	Prep in design booklet Key words and spellings with definitions in the design booklet.

Additional Notes

The design department is prominent and makes a positive contribution to wider school life. Design is very varied and there are several displays outside our classroom of styles of work and design careers. We also explain to students, that while we understand most of them will not become designer, the knowledge they acquire is especially useful to becoming well-educated in the broader sense, as well as developing their ability to communicate effectively. Being professionally qualified in this subject is regarded as a sign of being well educated, even if it is not directly applicable to the work or course of study.

Staffing

Head of Department	Melissa Ward
Teaching Staff (specialism where appropriate)	Dipti Mistry
Senior Link	N. Rawes