Willingdon
COMMUNITY SCHOOL

Innovation by Design

Research the work of others, design for a better world, make model prototypes.

Headline Data: 66.6% 9-4

CURRICULUM BOOKLET

Design & Technology

“The best way to predict the future is to invent it.”
— **Alan Kay**

2025

Our School Curriculum Vision

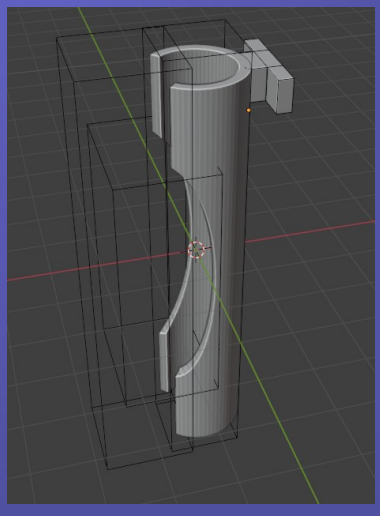
The curriculum at Willingdon Community School offers a broad, balanced, personalised and challenging educational experience, which builds on students' experiences in the primary phase of their education.

It aims to provide all students with the knowledge, understanding, skills and attitudes which are necessary if they are to become successful learners who enjoy learning, make progress and

Subject Vision

At Willingdon, our Design & Technology curriculum offers a broad and inclusive range of opportunities, ensuring every student can access, enjoy, and thrive in the subject. We aim to nurture confident, self-motivated learners who can work independently and collaboratively, equipped with the skills and mindset needed for success in an ever-changing world.

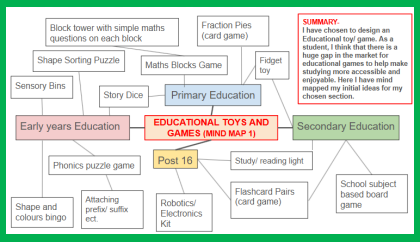
Students develop practical and technical expertise alongside transferable skills valued by employers—resilience, creativity, problem-solving, and teamwork. We believe students learn best through hands-on experience, and we encourage them to take risks, embrace mistakes as part of the learning process, and think critically in a safe, supportive environment.

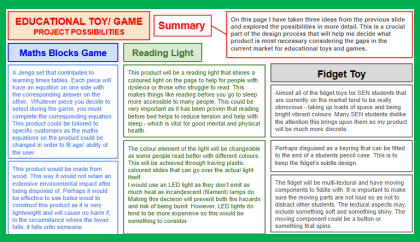


Our teaching is imaginative, forward-thinking, and rooted in real-world practice—blending the latest technologies with the best of traditional craftsmanship. We actively seek opportunities to connect learning to the wider world through community partnerships and enterprise projects, which are embedded across our schemes of work and enrichment programmes.

Key Concepts in Design & Technology

Students complete a 8-week project each year that builds confidence, creativity, and practical skills in a safe, supportive, and engaging environment.



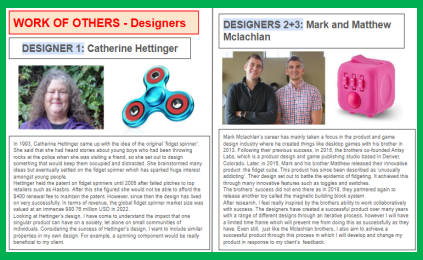


The curriculum:

- Encourages cross-curricular links and transferable skills for future careers.
- Combines design, making, and critical evaluation to produce high-quality outcomes.
- Follows a spiral structure that builds towards GCSE readiness.
- Promotes sustainable thinking and responsible innovation.

Design

- Identify and reformulate design problems.
- Create detailed, user-centred specifications and innovative ideas.
- Use a range of creative strategies (e.g. biomimicry) to avoid stereotypes.
- Communicate ideas clearly through sketches, models, presentations, and digital tools.

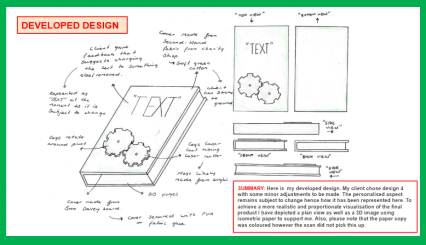


Make

- Use specialist tools, processes, and CAM accurately.
- Choose and work with a broad range of materials based on their properties.

Evaluate

- Study the work of designers past and present.
- Explore emerging technologies and test ideas against design specifications.
- Consider the societal and environmental impact of design decisions.

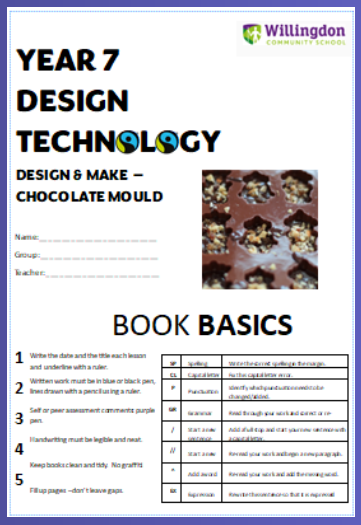


Technical Knowledge

- Apply material properties and structural knowledge in practical work.
- Integrate advanced mechanical, electrical, and electronic systems.
- Use programming and sensors to create intelligent, responsive products.

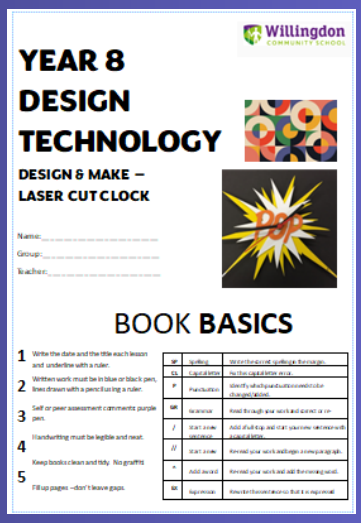
Programme of Study
Key Stage 3

Design and Technology is taught to all Key Stage 3 students. Students are taught in mixed ability groups of a maximum of 24 for a period of 8 weeks, they receive one lesson a week which all include research, theory, evaluation and a final outcome.



Learning in year 7

Students will learn about Fairtrade and how design can be used to promote messages of fairness and kindness. They will develop technical drawing skills including isometric and freehand sketching to design their own chocolate shape. Students will explore existing chocolate products and symbols of Fairtrade to inspire their ideas. They will use 2D Design to create a template for their mould and develop practical skills by shaping wood to form a mould suitable for vacuum forming. The project will also introduce students to the properties of food-safe plastics and the vacuum forming process.



Learning in Year 8

Students will explore graphic design, CAD/CAM, and cultural influences through the development of a laser-cut clock. Working to a design brief, they will research and analyse key art movements such as Pop Art, Bauhaus and Art Deco to inform their design ideas. Students will learn about layout, composition and the role of design in society, using software like Onshape to create their final clock face. They will develop technical skills in digital design, laser cutting, material finishing and product assembly. Throughout the project, they will consider materials, accuracy in manufacture, and how design choices impact both users and aesthetics, resulting in a functioning and visually impactful timepiece.

Learning in Year 9

Students will explore product design and gameplay development by working to a creative brief to design and make a small board game. They will investigate different types of games, game mechanics, and target audiences. Through iterative design, students will learn how to develop engaging themes, rules, and visual elements. They will use a range of materials and techniques—including card modelling, digital design (e.g. using Photoshop or Illustrator), and possibly laser cutting or 3D printing—to prototype and manufacture their game components. Students will also explore the importance of packaging and branding, and evaluate their outcomes through user testing and feedback.

Assessment Plan for Key Stage 3

Design and Technology capability will be built upon over the year to give a final teacher assessment. The student will often be using GCSE criteria and grading to support them with their tasks.

Typical homework will include: -

- Design development sketches or annotation work to refine ideas at home
- CAD practice or worksheet-based tasks to reinforce software tools
- Evaluation questions to reflect on progress and link design choices to the brief
- Learning key vocabulary
- Completing examination questions
- GCSE content ready to move up to KS4.

Each homework will be short, purposeful, and support the learning in class without needing specialist equipment.

Students are given regular feedback within the different units. Feedback comes with targets for improvement which they are expected to respond to by adding their own reflective and evaluative comments about how they are going to improve their grades.

CRITERIA	EMERGING	DEVELOPING	SECURING	MASTERY
RESEARCH & SPECIFICATION	Limited research or unclear user/cultural understanding. Incomplete or vague specification.	Some relevant research and basic user insight. Specification includes 3+ points.	Detailed research showing clear user/cultural understanding. Strong 5+ point specification.	In-depth, insightful research. High-level specification clearly informs design.
CREATIVE DESIGN & COMMUNICATION	Few ideas, limited originality, weak annotations.	Some creative ideas; basic annotations.	Range of creative ideas with clear annotated and dimensioned drawings.	Original and innovative ideas. Excellent presentation with advanced drawing or
MAKING & TECHNICAL ACCURACY	Basic shaping with frequent support. Low-quality finish.	Mostly accurate with some guidance. Functional outcome.	Accurate, independent tool use. Well-finished and functional mould.	Excellent craftsmanship. Confident, precise, and high-quality final product.
EVALUATION & REFLECTION	Limited reflection; vague or unsupported comments.	Basic evaluation with some insight and 1+ improvement point.	Detailed evaluation using specification and feedback. Clear improvements pro-	Deep, thoughtful evaluation with critical analysis and testing evidence.
TECHNICAL KNOWLEDGE & UNDERSTANDING	Little understanding of processes/ materials. Basic vocabulary use.	Some relevant knowledge applied. Developing technical language.	Clear understanding of materials, processes, and safety. Accurate use of vocabulary.	Excellent application of technical knowledge. Consistent and confident terminology.

Programme of Study
Key Stage 4

AQA GCSE Design & Technology

GCSE Design & Technology Overview
The course is 50% exam and 50% coursework (NEA), which begins after the design contexts are released on **1st June in Year 10**.

Projects Include:

Coat Hook or Wall Hanging – Designing for a chosen client, focusing on user needs and practical making.

Desk Tidy for IKEA – A design brief inspired by IKEA's brand, exploring function, aesthetics, and identity.

Nail & String Wall Art – A creative task developing fine motor skills and craftsmanship.

Theory and Practical Learning
Theory is taught alongside practical work, covering both core and specialist technical principles.

<u>Core technical principles</u>

- new and emerging technologies
- energy generation and storage
- developments in new materials
- systems approach to designing
- mechanical devices
- materials and their working properties
- specialist technical principles
- selection of materials or components
- forces and stresses
- ecological and social footprint
- sources and origins
- using and working with materials
- stock forms, types and sizes
- scales of production
- specialist techniques and processes
- surface treatments and finishes.

In Year 11 students will complete the majority of their NEA coursework and then an intensive term preparing for the final exam. The breakdown is shown below.

Paper 1

What's assessed

- Core technical principles
- Specialist technical principles
- Designing and making principles

In addition:

- at least 15% of the exam will assess maths
- at least 10% of the exam will assess science.

How it's assessed

- Written exam: 2 hours
- 100 marks
- 50% of GCSE

Questions

Section A – Core technical principles (20 marks)

A mixture of multiple choice and short answer questions assessing a breadth of technical knowledge and understanding.

Section B – Specialist technical principles (30 marks)

Several short answer questions (2–5 marks) and one extended response to assess a more in depth knowledge of technical principles.

Section C – Designing and making principles (50 marks)

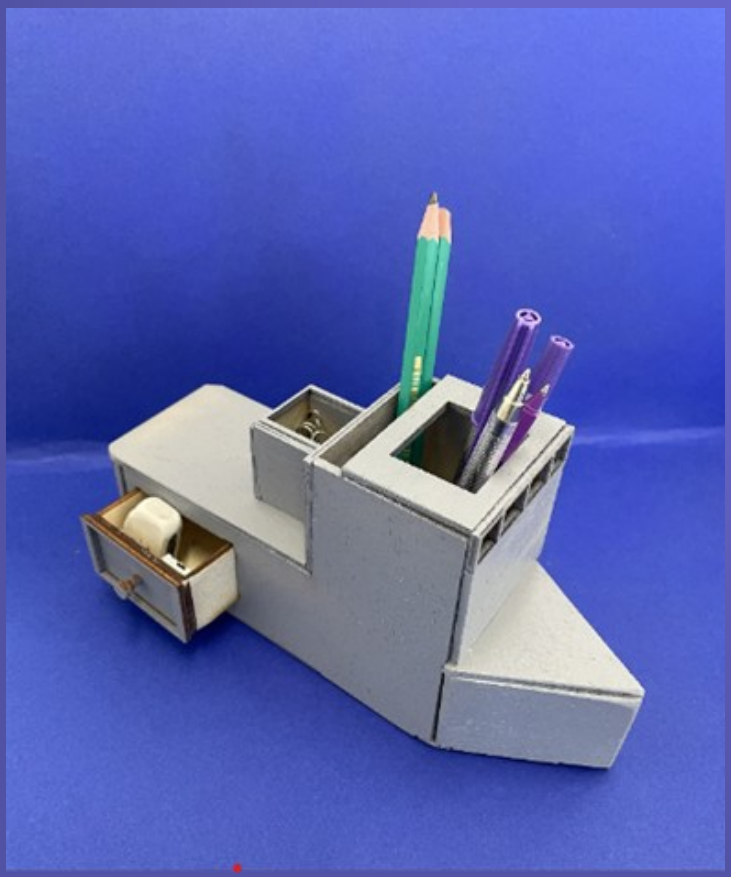
A mixture of short answer and extended response questions.

4.2.1 Assessment objective weightings for GCSE Design and Technology

Assessment objectives (AOs)	Component weightings (approx %)		Overall weighting (approx %)
	Paper 1	NEA	
AO1	0	10	10
AO2	0	30	30
AO3	10	10	20
AO4	40	0	40
Overall weighting of components	50	50	100

	Section	Criteria	Maximum marks
AO1 Identify, investigate & outline design possibilities	A	Identifying & investigating design possibilities	10
	B	Producing a design brief & specification	10
A02 Design & make prototypes that are fit for purpose	C	Generating design ideas	20
	D	Developing design ideas	20
A03 Analyse & evaluate	E	Realising design ideas	20
	F	Analysing & evaluating	20
	Total		100

Assessment Plan for Key Stage 4



Assessments in Year 10 are based around two key areas, Preparation for the exam with core and specialist technical principles and focused practical tasks and projects that reflect the demanding and complex making skills required for the NEA in year 11. Assessments are all internal in year 10, with the final GCSE grade coming from their terminal exam in year 11 and the NEA task set in Year 11.

Year 10 concludes with a assessment paper based on theory and a set of practical skills assessed over two mini style projects.

Assessments in Year 11 are made as students make progress through the NEA task.

NEA assessment criteria:

10% • Identifying and investigating design possibilities

10% • Producing a design brief and specification

20% • Generating design ideas

20% • Developing design ideas

20% • Realising design ideas

20% • Analysing & evaluating

The exam is then 50% of the GCSE and is comprised of the areas explained below:

- PROBLEM SOLVING
- CREATIVE THINKING
- INVESTIGATION
- RESEARCH
- COMUNICATION
- DEVELOPMENT
- REFINE
- PRESENT IDEAS

DESIGN AND TECHNOLOGY LEARNING JOURNEY

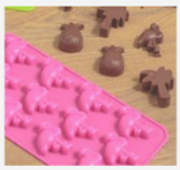
CF = Careers Focus: Problem solving, Research, Investigation Comminication, Teamwork skills. Gaining the ability to develop, refine and present ideas.

Chocolate mould

Design, saw, file, Vacuum forming

Consider the design brief and design ideas
What are you designing and making and Why?

Create a mould shape. Using wood and the vacuum former to create your chocolate mould. Consider your design and the Function techniques. Consider the positive or negative impact your creation makes to our planet



Realising Design Ideas

Make the Product
Build your product step by step.
Take Photos
Take a photo at each stage.
List Tools Used
Write down the tools and materials you used.
Explain Changes
Say what you changed and why.
Final Photos
Take clear photos of the finished product from different angles.

The impact of your design

,What impact does it have on society?
.How does it impact our environment.

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Laser cut clock

Design, Laser cut, Pillar drill

Ongoing Evaluation
Check the product
. Does it meet your design goals? (compare it to your design specification)
Client Feedback
. Ask the user or client what they think (feedback form or comments)
Final Interview
. Talk to the client/user about the finished product
Improvements
.Say what could be better and how you would improve it.

Using 2D design to create a laser cut clock, material chosen from laser wood or acrylic

Students should explore a range of possible ideas linking to the contextual challenge selected.

Explain were your product may be used and explain reasons for design

8

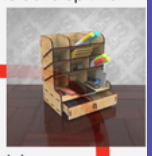
Game design and make

Generating ideas :
Identify different types of material you wish you use and their properties.
why do these materials fit your design well?
.Discuss how anthropometrics will affect the design.
.Explain how these designs have come from your research.
.Annotate each design using ACCESSFM and MASQUE.
.Evaluation of each idea, explain the suitability against the design specification /
.Summarise the design ideas,evaluate which idea you think is best to develop and take further

9

Desk tidy+Coat hook/wall hang

Sawing,Fixtures, Nails, screws and Pillar drill



Who is your client user?

Client:
.What are their specialist needs?
.How might the product help them?
.Create a questionnaire/interview questions to ask your client.
How could your design help them?
photographic evidence of the client and their needs
Summarise the research you have found and how you came to the final decision and make of the product

Design specification
what you product must do and why in relation to your client use MASQUE

Practical: Desk tidy project
Design and produce a desk tidy using acrylic or laser cut wood materials

Using 2D design format and creation of own designs

Developing ideas
.Create a model of the design idea
.Photograph the model in use
.Get feedback from the client about the model made
.Analyse and evaluate and make improvements
.Recreate model with the improvements
.Photographs and annotations of the model , identfiy the channges made and give reasons why.
.Recive feedback from client after changes have been made
.Analyse and evaluate your model .Think of final possible changes. Use CAD to help.
.Sketch final design of product

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GCSE NEA Project

NEA SECTION A:
Identifying and investigating design possibilities, using creatiive thinking.

NEA SECTION B:
Producing a design brief and specification

NEA Section C:
Generating design ideas

NEA section D:
Creating Prototypes in card, wood and plastic.

NEA Section E:
Producing the final product and testing against the spesification

NEA Section F: Analysing and evaluating

Examination Revision- look at past papers and re-visit topics covered

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GCSE Exam Preparation

Options Booklet Entry

AQA GCSE Design & Technology

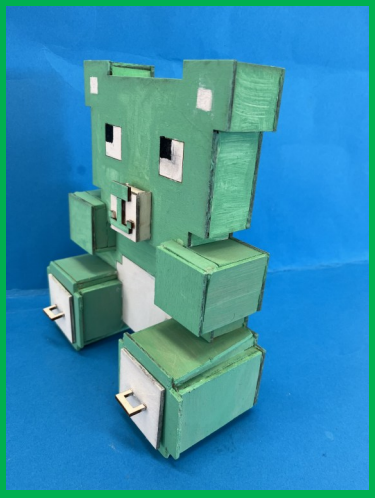
In Key Stage 4, students complete a practical design and make project where they explore creative ideas and produce high-quality work using modern tools like laser cutters and computer-aided design (CAD). They also learn to use traditional workshop equipment safely and confidently.

Students will look at how technology influences our lives—both positively and negatively—and study existing products and famous design styles like Memphis, as well as designers such as Alessi and Philippe Starck. This helps them understand what makes great design.

The main coursework project is set by the exam board (AQA) and takes place over 30–35 hours. Students choose a design brief, research ideas, test materials, and create a working prototype alongside a digital portfolio showing their thinking and progress.

Assessment Breakdown:

- 50% Coursework (design and make project with portfolio – assessed in school and moderated by AQA)
- 50% Written Exam (testing knowledge of materials, processes, and design principles)



We use **ACCESS FM** to help us write a **specification** - a list of requirements for a design - and to help us **analyse and describe** an already existing product.

ACCESS FM - Helpsheet

A is for **Aesthetics**

Aesthetics means **what does the product look like?**
What is the: Colour? Shape? Texture? Pattern? Appearance? Feel? Weight? Style?

C is for **Cost**

Cost means **how much does the product cost to buy?**
How much does it: Cost to buy? Cost to make?
How much do the different materials cost? Is it good value?

C is for **Customer**

Customer means **who will buy or use your product?**
Who will buy your product? Who will use your product?
What is their: Age? Gender?
What are their: Likes? Dislikes? Needs? Preferences?

E is for **Environment**

Environment means **will the product affect the environment?**
Is the product: Recyclable? Reuseable? Repairable? Sustainable? Environmentally friendly? Bad for the environment?
6R's of Design: Recycle / Reuse / Repair / Rethink / Reduce / Refuse

S is for **Size**

Size means **how big or small is the product?**
What is the size of the product in millimeters (mm)? Is this the same size as similar products? Is it comfortable to use? Does it fit? Would it be improved if it was bigger or smaller?

S is for **Safety**

Safety means **how safe is the product when it is used?**
Will it be safe for the customer to use? Could they hurt themselves? What's the correct and safest way to use the product? What are the risks?

F is for **Function**

Function means **how does the product work?**
What is the products job and role? What is it needed for? How well does it work? How could it be improved? Why is it used this way?

M is for **Material**

Material means **what is the product made out of?**
What materials is the product made from? Why were these materials used? Would a different material be better? How was the product made? What manufacturing techniques were used?

Existing Products - 1 & 2

Summary
A more in depth detailed research on two products that are already on the market, using ACCESFM.

Section A

Existing Product 1

Name : Next Pink Handheld Lunch Bag - Pink

Dislikes : I think quite too small for my user. So, for my design I will increase the capacity.

Likes : I like the use of the pockets at the front, which will inspire me.

Existing Product

Aesthetics - Light pink bag with a sleek stitching creating a minimalist and simple aesthetic. Mainly targeting to the female audience.

Cost - £18

Customer - Perfect small lunch bag for people the age +15, targeting mostly women by the use of colour. Many would like it for the simplicity of the exterior.

Environment - Reusable bag and able to repair if broken by stitching. Uses environmentally friendly materials like cotton, reducing harm.

Size - H25cmx w20cm x D12cm

Safety - Has zippers to prevent risk of items falling out, has thicker straps to distribute the weight on the shoulders.

Function - Used as a lunch bag when going out

Material - Exterior made from pink cotton and lining made from polyethylene.

Existing Product 2

Name : Monogram Midnight convertible insulated lunch bag

Dislikes : I dislike the exterior colours as they dont match evenly with the colour scheme and how the use of microfiber as their main material as it is a non-biodegradable material.

Likes : I like the design of the product, so this might influence me for my final outcome

Existing Product

Aesthetics - Navy blue with intricate patterns and a blue and beige stripes across the bag.

Cost - £19.99

Customer - Can be used for anyone ranging in groups from adults to teens and gender. Many would like it by how multifunctional it is.

Environment - Reusable, so less harmful to environment and can be used over again. However uses unsustainable materials such as microfiber which can harm the ocean by the plastic particles inside the bag.

Size - H19cm x W24cm x D15cm. Has a weight of 220g

Safety - Has zippers to prevent risk of items falling out, has thicker straps to distribute the weight on the shoulders.

Function- Convertible bag that can turns into a lunch bag, normally used when going out.

Material - Made out of navy microfiber for the exterior and a PEVA lining.

GCSE Design and Technology

Non-Exam Assessment

Assessment Criteria

Task Analysis
All possibilities identified and fully explored. Excellent understanding of problems and possible solutions.

Client
Target Market identified. Comprehensive investigation of their needs and wants. Show how this influences designs.

Influence
Full investigation into the work of others clearly informs design ideas.

Ongoing
Evidence that the research has been used to develop designs throughout the project

Brief
Detailed design brief.
Explain how the clients needs and wants have been considered.
Explain exactly how the identified problem will be solved.

Techniques
Range of different techniques used to communicate design ideas.
2D, 3D, modelling, CAD.
Evaluation of each idea with client opinion.

Research
Research has clearly influenced each design idea

Creativity
Lots of different ideas that could solve the problem.
Full consideration of functionality, aesthetics and client wants and needs.

Specification
Detailed design specification.
Very high level of justification.
Focus on the needs and wants of the user.
Used to evaluate all design ideas against.

Modelling
Excellent modelling using a range of techniques.
Models are fully evaluated against specification and client needs.

Materials
Fully appropriate materials selected, showing extensive research into their working properties and availability.

Techniques
Range of technical design techniques used.
Detailed sketching, 3D CAD, card modelling.

Manufacturing Specification
Fully detailed manufacturing specification with comprehensive justification of all manufacturing points.

Evaluate at every stage
All designs, models and the final product have been evaluated and improvements explained, including the reason why,

Evaluate against specification
All aspects of the final product have been evaluated against the specification.
All possible improvements explained.

Client
Client feedback has been gained and fully evaluated at every stage, including designs, models and the final product.
Explained how this feedback has or will lead to development.

Quality Control
Quality control steps are used at every stage and are fully explained.

Manufacturing
Range of tools and materials.
High quality product.
Suitable for the client.

R Research and Investigation	10/100
S Design Brief and Specification	10/100
G Generating Design Ideas	20/100
D Developing Design Ideas	20/100
M Realising Designs	20/100
E Evaluating	20/100

ACA Resources

British Values in Design and Technology

Design & Technology is a practical and creative subject that empowers young people to contribute meaningfully to culture, the economy, and their communities. It connects students to Britain's rich design heritage while encouraging them to shape the world around them through hands-on experiences that build confidence, innovation, and enterprise.

The subject promotes key British values. Individual liberty is encouraged through student choice and creativity. From KS3 to KS4, students have freedom to explore personal ideas and take ownership of their learning, building independence and resilience. Democracy is experienced through collaboration, discussion, and peer assessment, where all voices are valued.

Understanding and following rules is essential in the workshop, reinforcing the rule of law and shared responsibility. Mutual respect and tolerance are embedded in every project through teamwork, cultural awareness, and thoughtful peer feedback. Students learn to challenge inappropriate behaviour and help create a positive, inclusive environment.

D&T also supports moral, social, and environmental understanding. Students explore ethical design choices and sustainable practices, including the 6 Rs: Rethink, Repair, Reuse, Recycle, Reduce, and Refuse. They reflect on the impact of products across their life cycle.

Through open-ended projects, students gain self-esteem, discover their strengths, and develop creative, real-world solutions. Studying British design and global influences builds critical thinking, pride in UK innovation, and an appreciation of diverse cultures.

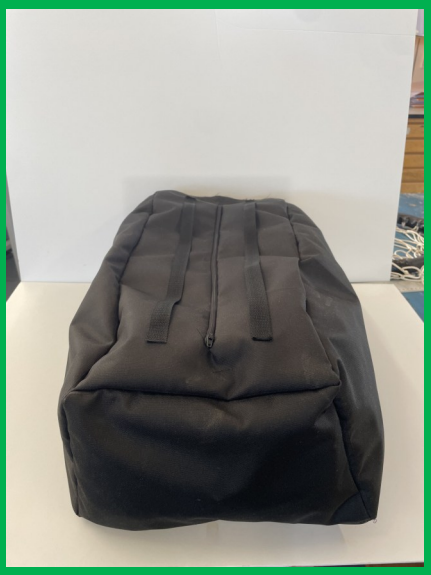
In summary, D&T helps students grow as responsible, skilled citizens—equipped to shape a better, more sustainable future.

Spiritual, Moral, Social & Cultural Development

Spiritual development in Design & Technology is fostered by encouraging students to explore the creativity and meaning behind design and making. Pupils are given opportunities to engage with art, design, and products from different cultures and countries, helping them to appreciate the diversity and richness of the world around them. Through this, students develop a sense of wonder, curiosity, and respect for the ideas, beliefs, and values of others.

Moral development is promoted by helping students understand the impact of their design choices on people, society, and the environment. They develop skills in independent thinking, creativity, and responsible decision-making as they explore materials, techniques, and global design practices. Pupils are encouraged to consider ethical issues such as sustainability, fair trade, and responsible use of resources.

Social development is encouraged through collaborative work and constructive dialogue. Students articulate their thoughts and feelings through peer and self-evaluation, developing effective communication skills and learning how to give and receive feedback respectfully. Team projects build cooperation, shared responsibility, and mutual respect in the classroom environment.



Cultural development is evident as students learn how design reflects and responds to different cultural needs, traditions, and values. They explore how factors such as language, colour, and product function vary across cultures and how these considerations influence design. Students investigate design and making techniques from around the world, gaining insight into global perspectives and practices.

Literacy in D&T

Literacy is centred around the core focus of specialised vocabulary, especially key terms relating to the scientific element of the course. Students will learn how to research, construct and evaluate their work along with the skills necessary to write clear reports so that they can gain maximum marks in both the NEA coursework and the written exam

Numeracy in D&T

Numeracy is an essential component of the students' studies in DT and is generally interwoven through the design and make experiences the students encounter throughout their time at Willingdon. We will cover the following areas:

Arithmetic and numerical computation

Ratios, fractions and percentages as well as surface area and volume.

Handling data

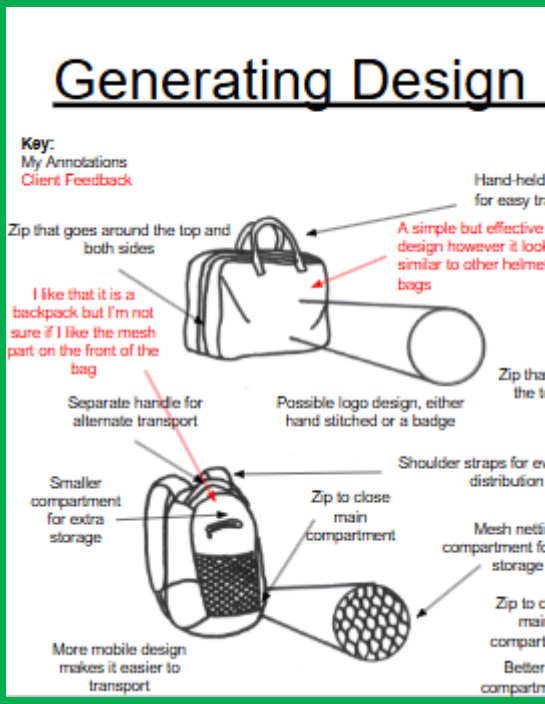
Presentation of data, diagrams, bar charts and histograms.

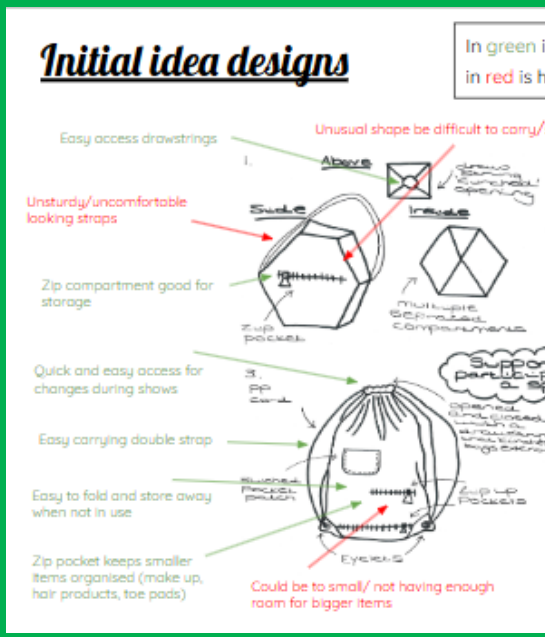
Graphs

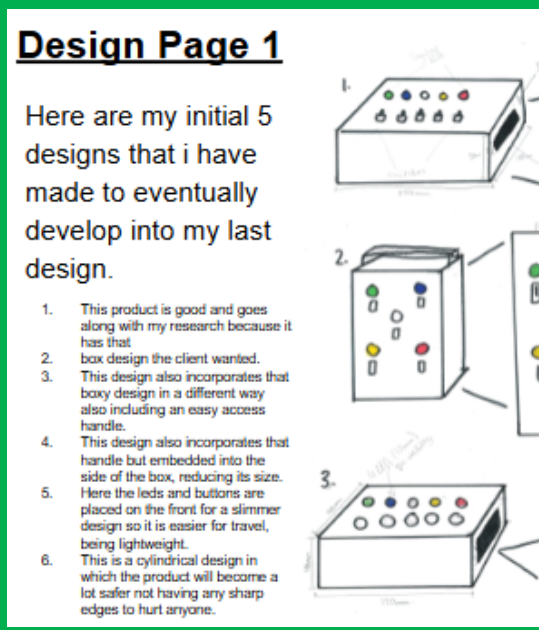
Plot, draw and interpret appropriate graphs and translating information between graphical and numeric form.

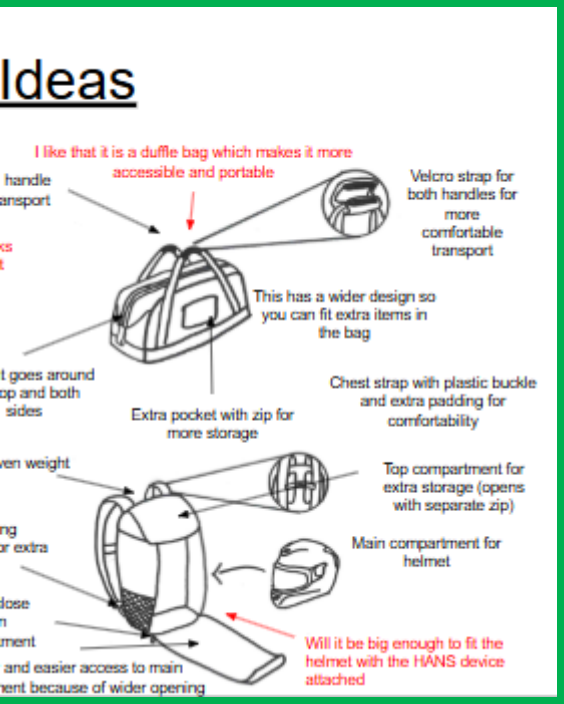
Geometry and trigonometry

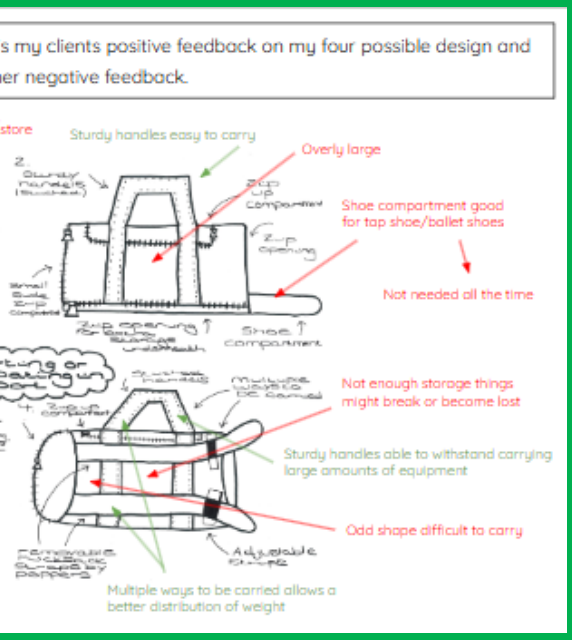
Use angular measures in degrees. Visualise and represent 2D and 3D forms including two dimensional representations of 3D objects. Calculate areas of triangles and rectangles, surface areas and volumes of cubes.

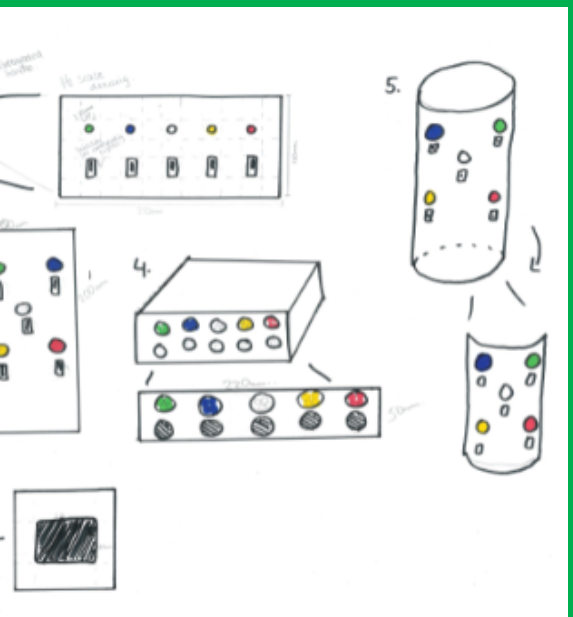












Broadening horizons in D&T

The skills developed during this GCSE course not only allow students to demonstrate and develop their originality, flair and innovation, but it also provides skills that make better informed and intelligent consumers.

It provides a solid platform for many career paths, such as carpentry, engineering, mechanics, product design well as a sound background for other less obvious careers, where the ability to think differently and creatively gives our students the edge on the competition.

Raising aspirations in D&T

GCSE D&T opens the door to a wide range of careers in the creative, engineering and manufacturing industries. It is also excellent preparation for careers in many other fields e.g. medicine, law and computer science. Whatever career you choose, the knowledge and skills you learn, particularly those concerned with rapidly developing technologies, will be extremely valuable.

You will also develop skills, such as teamwork and time management which are highly prized by employers