



Curriculum Statement

Design and Technology Department
Ranelagh School

‘For the Spirit that God has given us does not make us timid; instead, his Spirit fills us with power, love and self-control’ 2 Timothy 1:7

At the heart of our distinctive culture is our commitment to being a dynamic learning community, rooted in Christianity, where people matter. In this we seek wisdom and pursue excellence.

Core Values

The Design and Technology Department at Ranelagh School aims to provide all students with an education to teach students how to become inquisitive and creative citizens whilst being embedded in our shared vision and the core values of the Ranelagh School Learner Profile:

- Confidence - Students who are self-assured are more likely to take risks, see mistakes as learning opportunities and be open to new learning experiences. They have poise and self-belief; this means that even when learning is difficult, they will persist.
- Resilience - Students are able to keep learning even when they find work difficult. They show flexibility and stamina. When they need to work for long periods on challenging problems they persevere.
- Curiosity - Students who are keen to enquire will ask questions and have a genuine interest to learn more. They are inquisitive and work hard on further developing their skills and knowledge. This means they are more likely to understand their own abilities, interests and future aspirations.
- Creativity - Students use inventive, resourceful and original ways to learn. They produce learning outcomes that demonstrate their ingenuity and imagination.
- Empathy - Students can listen, understand and learn from others. They are well placed to work as part of a team. They show warmth, humour and positivity and collaborate effectively with others.
- Independence - Students are self-motivated, they understand how they learn and can manage themselves. They have self-belief, can access resources and know how to learn successfully beyond Ranelagh.

Intent

The Design Technology curriculum is a progressive model aimed at developing students to become inquisitive and creative citizens in both KS3 and KS4. Within our subject, students will use creativity and imagination, design, develop and manufacture products that solve real and relevant problems within a variety of contexts, considering their own and others’ needs, wants and values.

Implementation

We use a hands on practical approach to learn in an environment that provides opportunities for experiential learning (iterative design) that provides access to a wide range of skills. This enables students to succeed in creating a range of products, developing confidence in a practical environment, using a variety of tools and equipment. Students will be fully engaged in challenging activities both theory based and practical that will ensure a good understanding of the skills and knowledge relating to the context of the subject.

Impact

We aim to ensure the students:

- 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 and critique, evaluate and test their ideas and products and the work of others.
- Students 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.

Design and Technology Curriculum Questions/Overview

1. What are the objectives of your curriculum?

- Our objective is for students to gain transferable skills that they can apply to solving real issues in the real world. We want to challenge students to combine academic and creative thinking with practical skills to design, develop and manufacture inspirational quality products. Students need to be able to understand the design process, considering not only their own needs, but the wants and values of others.
- Design and Technology will prepare students to participate confidently and successfully in an increasing technological world.

What is its purpose at each key stage?

KS3

- Build the foundations for GCSE Design and Technology. An introduction to understanding users, identifying and implementing a variety of research methods, awareness of sustainability, working properties of materials, taking risks to create imaginative ideas, work safely with tools, equipment and machinery, evaluate own work and the work of others.

Due to the carousel system the delivery of the KS3 curriculum is restricted. We do not have a full year with the students.

KS4

- To teach the students about a broad range of materials and processes to allow students to make more informed choices when specialising post 16. Students will gain awareness and learn from wider influences including historical, social, cultural, environmental, and economic factors.
- To be able to work independently in order to research, design, develop, manufacture and evaluate their own product (and the work of others) based on a contextual challenge set by the examination board to solve a real life problem.
- To provide opportunities for students to apply knowledge from other disciplines, including maths, science and possibly art and computing.

KS5

- For students to continue to develop their passion and enthusiasm for the subject. To teach students to think and act like a designer in industry e.g., how to be innovative and make creative use of a variety of resources including digital technologies, to improve the world around them.
- To prepare them for careers in the STEM industry.

2. What do your students actually learn about? Why?

See above and below.

3. What do you want students to know and do at end points? Why is it important to know/master? Is there clear tracking of development of skills and knowledge?

KS3

- At the end of each rotation for all students (LPA, MPA and HPA) to have an awareness of a material (including the working properties) and at least one industrial process. To understand the need to design for a client, the importance of research, present creative ideas clearly that are annotated to aid communication, manufacture and evaluate.
- For all students to design and make a product independently.

- *Tracking*
 - Student booklets and teacher mark books will record grades for knowledge, design, manufacture and evaluation.
 - End of unit tests are written into the SOL (Year 7 and 8)
 - End of year exam (Year 9)
 - Evidence on TEAMS – homework submission and marking, Quiz/Microsoft Forms to test key concepts and/or recall testing
 - Assessed areas – marks are to be inputted onto a SIMS document to keep data centralised.

KS4

- To understand the effects design has in the world e.g. from the 'cradle' to the 'grave'. To enable students to actively contribute to the creativity, culture, wealth and well-being of themselves, their community and nation.
- To learn to design and make products that solve genuine, relevant problems within different contexts whilst considering their own and other's needs, wants and values.
- *Tracking*
 - teacher mark books will record grades including effort grades for classwork/homework
 - End of unit tests are written into the SOL
 - End of year exam (Year 10) and mock exam
 - Evidence on TEAMS – homework submission and marking, Quiz/Microsoft Forms to test key concepts and/or recall testing.
 - Practical skill tasks will show evidence of outcomes achieved
 - *NEA is tracked against marking criteria*

KS5

- To strengthen knowledge learnt at KS4
- To understand the design industry, market influences that a designer must consider and the industrial processes involved.
- To be able to understand exam terminology and answer examination questions
- To be able to produce a design portfolio and manufacture a product similar to a designer in the real world (NEA).
- *Tracking*
 - teacher mark books will record grades including effort grades for classwork/homework
 - *Exam questions to track knowledge and understanding.*
 - End of unit tests are written into the SOL
 - End of year exam (Year 12) and mock exam
 - Evidence on TEAMS – homework submission and marking, Quiz/Microsoft Forms to test key concepts and/or recall testing
 - *NEA is tracked against marking criteria*

4. How does your curriculum plan set out the sequence and structure of how it's going to be implemented? Does new knowledge and skills build on what has been taught before? KS2 to 3 KS3 – 4 and KS4 – 5. Why is it shaped the way it is?

- KS2 – more investigation is needed into finding out what KS2 skills our students have learnt.
- KS3 – the curriculum is shaped to help build the foundations of the new GCSE specification.
- KS4 and KS5 – curriculum is determined by the exam board specifications.
- SOL designed and issued to all technology staff to follow sequence of teaching.

5. What values have guided your decisions about the curriculum you have in place?
How does your curriculum reflect our school's context?

The design and technology curriculum reflects the school's context by encouraging learners to become independent, become more resourceful, risk takers, problem solvers, creative and curious as well as think about Social, Moral, Sustainability and Cultural issues in the design world we live in.



DESIGN TECHNOLOGY



Core content and specialist knowledge:
Revise and practice exam papers in preparation for your final exam in DT

FINAL GCSE EXAM

EXAM REVISION

A03: Evaluate & Test:
Gain feedback throughout your project and test your final product. Have you met your brief and contextual challenge?

A02: Realise Design Ideas:
Manufacture your product using skills and processes used throughout your DT journey

A02: Generate & Develop Design Ideas:
Develop your sketches and communicate ideas. Developing them using modelling techniques

Initial Concept Sketches:
What ideas do you have already? Can you visualize them?

A01: Specification & Brief:
Clarify the needs and wants of the project writing your own brief & specification

A01: Research & Investigation
To understand and explore the contextual challenge set by exam board. Client interviews, product, site analysis and designer research

NEA COURSEWORK
Inc. Designing and Making Principles

YEAR 11



Investigate the design possibilities:
What is the design context? What research can you carry out to gather ideas?



Research and Specification:
Investigate existing products, generate a mood board and write a specification

After choosing options in year 9, focus your studies on GCSE DT in years 10-11, through exciting, real-life projects. Deepen your understanding of DT in the world around us whilst developing products that help various needs and users.

YEAR 8
Work in more depth, honing your practical skills. Improve your resilience & problem solving whilst developing independence in the workshop.

YEAR 7
Experience a range of fun and exciting projects that teach you valuable skills in the workshop. Gain confidence in a range of drawing techniques including Computer Aided Design (CAD).

Practice NEA:
A mini project to gain an understanding of GCSE NEA requirements and mark scheme - research, designing, development, manufacture and evaluation.

Timbers and Polymers:
Theory lessons to support understanding of 'Timbers' and 'Polymers', including sources and origin, properties, shaping, tools and equipment etc. A series of focused practical tasks to develop a practical knowledge of specialist processes and techniques.

Theory:
Explore the world of design. Gain an insight into new materials and emerging technologies. Awareness of sustainability, life cycle assessment, cultural, social and economic factors

Assessment:
Topic tests and end of year exam

MINI NEA (Mock)

SPECIALIST TECHNICAL PRINCIPLES

CORE TECHNICAL PRINCIPLES

GCSE NEA CONTEXTS

Baseline Assessment:
How much do I remember from KS3?

KS4

YEAR 10

Communication Techniques (Drawing):
Different drawing techniques to help communicate design proposals

Assessment:
End of year exam

Practical Skills:
Further experience of practical workshop skills

WORKSHOP SKILLS AND DRAWING TECHNIQUES

Evaluate:
At each stage of making, how can you improve your product? Would you change anything?

Manufacture: (Part 2)
Develop knowledge and understanding of electronics. Be able to solder components safely. Understand inputs, processes and outputs.

Manufacture:
Working with acrylic and MDF to make base of mood light. Extend knowledge of manufacturing methods.

Polymers and Smart Materials:
Classification of polymers. Manufacturing methods of polymers. What materials are sustainable? Smart and modern materials

Testing / Modelling:
Produce a concept model half size of final idea using a range of modelling materials

Design:
Designing a night light for a client of your choice. How do we make a product fun and safe?

Design Task:
Design a keyring using the skills learnt in the rotation that can be laser cut.

YEAR 9

MOOD LIGHT PROJECT

Design:
Designing for a user and client. Extension: Develop design ideas using CAD

Testing/Modelling:
Will my product work? What can I do to improve it?

Make:
Can you make an accurate product using hand tools independently?

Make (Part 2):
Can you make the packaging to promote your product?

Evaluate:
What skills have you developed? Test your product and consider how you would improve it

Baseline Assessment:
Measuring, cutting, shading and using isometric grid paper

End of Topic Test:
What have you learnt?

Design Task:
Design a keyring using the skills learnt in the rotation that can be laser cut.

Casting Methods:
What methods are used in industry?

Materials:
Metal Classification, Ferrous, Non-Ferrous and Alloys. Working with Pewter

Baseline Assessment:
Measuring, cutting, shading and using isometric grid paper

End of Topic Test:
What have you learnt?

CAD Task:
Importing a DXF files, extruding shapes and rendering materials

Evaluate:
How has CAD / CAM helped you make a product?

Make:
What is CAM? Use the laser cutter to produce your final product!

Charities:
How can we use charity as inspiration

Evaluate:
Does your product work? How can you improve your skills?

End of Topic Test:
What have you learnt?

PEWTER PROJECT

YEAR 8

Baseline Assessment:
Measuring lengths, diameters and angles, shading and presentation techniques

Design: CAD
What is computer aided design? Learn to use the basics of 2D software through a series of tasks

Designing Skills:
Learn a variety of drawing techniques including isometric, thick and thin, rendering textures.

CAD & DRAWING SKILLS

Make:
Wood joints Use of hand tools and machines

Modelling:
Testing of final concept Isometric drawing

Design:
Designing for users

Wood Fixings:
Permanent and temporary

Materials:
Wood classification. Where does timber come from?

Biomimicry:
How can we use nature as inspiration

Baseline Assessment:
Measuring, cutting, shading and using isometric grid paper

Introduction to the workshop:
Health and Safety

MAZE PROJECT

YEAR 7



KS3

OVERVIEW FOR STUDENTS

D&T offers you a curriculum which will engage and enthuse a passion for the subject, giving you the opportunity to explore practical activities which will enable you to master the skills and secure your knowledge.

D&T provides the subject specific skills and knowledge as a platform for you to take your next steps, from KS3 to KS4, then onto a professional career within the creative sector or further education.

GCSE Design and Technology will develop your skills in working with timber and plastics. You will explore iterative designed concepts, review a range of past designs and designers, develop your drawing skills and find out about new and emerging technologies such as laser cutting, 3D printing and smart materials.



SEQUENCE OVERVIEW

Why is our delivery designed this way?

Design and Technology can not be taught in a linear system. We have to revisit the design process to ensure students understand and apply the knowledge they have learnt. Students learn how to connect their learning and apply the skills they have learnt into practical applications and to life in the real world.

Year 7 are introduced to timbers, CAD and polymers throughout the two rotations. Some students may not have encountered a workshop before. They learn a basic understanding of simple workshop tools and processes, investigate existing products as well as how to use a CAD package, technical drawing such as isometric, model and present ideas.

In Year 8, as we only have one rotation, we continue to work on more workshop skills and processes, developing independence and confidence to create a design for Pewter casting. Students learn a new material, metal. They have to show empathy as their designs need to be based on a charity, this can be local, national or globally. Workshop skills begin to get more intricate using a coping saw to cut out a small shape within a piece of MDF, this acts as the mould for the pewter casting product.

Year 9, we look at inputs, processes and outputs through electronics, expand on previous knowledge of plastics and CAD as well as revisit basic workshop skills. As electronics, involves the use of soldering irons, we need to ensure our students are mature enough to use this equipment without causing harm to themselves and others.

By delivering this projects as Key Stage 3 we provide students with a good foundation for the GCSE specification as well as providing them with information of how products are made in real life with an understanding of materials and sustainability.

Design • Knowledge • Manufacture • Evaluate



Curriculum in DESIGN AND TECHNOLOGY 2021-2022

DESIGN AND TECHNOLOGY IS ON A CAROUSEL SYSTEM IN YEARS 7, 8, 9. Each rotation is 9 weeks.

Year	Rotation 1	Rotation 2
7	Introduction for Design and Technology, the workshops and health and safety. Design and manufacture a wooden box that houses a maze game (influenced by biomimicry) using a selection of hand tools and machinery.	Students will learn how to use a CAD package producing a series of CAD drawings using various tools. They will gain an understanding of the laser cutter through the designing of a key ring as well as knowledge of how the 3D printer works. Introduced to different drawing techniques such as isometric, thick and thin etc.
8	Recap of expectations and health and safety in Design and Technology. Design and manufacture a pewter cast product and packaging influenced by a charity.	
9	Recap of expectations and health and safety in Design and Technology. Design and manufacture a mood light using a range of hand tools, CAD/CAM, and electronic components.	Students will learn a range of workshop skills, drawing techniques and further their learning of CAD skills.

Year	Autumn Term	Spring Term	Summer Term
10	Design and make project – mobile phone holder charging unit (mini practise NEA). Specialist technical principles – timbers. This includes theory content and practical workshop skills. Materials and their working properties	New and emerging technologies Energy generation and storage Developments in new materials Understanding a systems approach when designing Polymers Workshop - skills	Designing and making principles Mechanical devices NEA Task (From June onwards)
11	NEA Task	NEA Task	Revision and exam
12	Drawing techniques Woods – softwoods, hardwoods and manufactured boards (including a practical project) Adhesives Plastics – thermosetting and thermoforming (includes a practical project)	Papers and Boards Textiles Smart and Modern Materials Finishing techniques Factors influencing the development of products Effects of technological developments	NEA Task Throughout the NEA Task students will also continue with the theory content of the course.



Curriculum in DESIGN AND TECHNOLOGY 2021-2022

	Composites Metals – ferrous, non-ferrous and alloys *The above materials also include processes, techniques, and specialist tools.	Features of manufacturing industries	
13	NEA Task Throughout the NEA Task students will also continue with the theory content of the course including mathematical skills.	NEA Task Throughout the NEA Task students will also continue with the theory content of the course including mathematical skills.	Revision and exam

