

## **TECHNOLOGY**

**What is the importance of the subject? Why should pupils be studying it? Why should they care about it? How might the subject link to the real world / real life scenarios?**

In design and technology pupils combine practical and technological skills with creative thinking to design and make products and systems that meet human needs. They learn to use current technologies and consider the impact of future technological developments. They learn to think creatively and imaginatively to improve the quality of life, solving problems within a variety of contexts as individuals and members of a team, considering the wants, needs and values of others. Through design and technology pupils develop confidence in using practical skills and become discriminating users of products. They apply their creative thinking and learn to innovate, as well as learning how to evaluate past and present design and technology, to develop a critical understanding of the subject's impact on daily life and in the wider world. Design and technology enables young people to actively contribute to the creativity, culture, wealth and well-being of themselves, their community and their nation. It teaches how to take risks and so become more resourceful, innovative, enterprising and capable. Additionally, it provides excellent opportunities for students to develop and apply value judgements of an aesthetic, economic, moral, social, and technical nature both in their own designing and when evaluating the work of others.

Our department aims and objectives:

- To provide a range of structured and differentiated activities which develop breadth and progression, where possible relating these to the personal interest and everyday experiences of our pupils.
- To develop knowledge and teach skills in order to design and make products successfully.
- To help children become aware of and investigate simple products by disassembly and evaluation.
- To show understanding and skills in order to design and make high quality prototypes and products for a wide range of users.
- To provide adequate time, access to information, skills and resources to make good quality products.
- To provide time to critique, evaluate and test their ideas and products and the work of others.
- To motivate pupils by providing interesting and stimulating experiences.
- To provide equal opportunities and develop the qualities of individual pupils.
- To enable pupils to use design and technology to solve a range of problems.
- To help pupils understand and apply the principles of nutrition, including healthy eating, and learn how to cook.

## What are the key concepts or big ideas underpinning the subject?

Pupils will acquire a broad range of subject knowledge and draw on disciplines such as:

- Designing
- Research analysis
- Product specifications
- Development of ideas
- Model making
- CAD/CAM (computer aided design/manufacture)
- Practical tasks
- Evaluating
- Subject specific vocabulary
- Industrial processes including sustainability
- Companies and designers
- Links to maths and science

## What topics will the pupils be studying in each year group?

In Years 7, 8 and 9 pupils experience all areas of technology through a carousel system. Time is spent in each of the four areas: food; resistant materials, product design and electronics; graphics with CAD/CAM (computer aided design and manufacture) and textiles. In Year 10 and Year 11 pupils may be working on one of our GCSE courses in Design and Technology or Hospitality and Catering. In Year 12 and Year 13 pupils may opt for an A-level in Product Design.

Topics studied in each year:

<b>Topics</b>	<b>RM/PD</b>	<b>Graphics</b>	<b>Textiles</b>	<b>Catering</b>
<b>Year 7</b>	Spinning tops	CAD/CAM introduction	Superhero masks	Muesli Fruit Salad Pizza Swirls Scones Beef Curry Pasta
<b>Year 8</b>	Bird box	Slot together toy - 2D design	Mini monsters	Savoury Rice Vegetable Soup Chilli Thai Green Curry Fish Cakes Fajitas
<b>Year 9</b>	Desk tidy	Solidworks	Travel cushion	Lasagne Cottage Pie Spring Rolls Quiche Chicken Tagine

<p><b>Year 10</b></p>	<p>Mini lighting unit project for a client Biomimicry project Focused practical tasks</p> <p>Theory including: Robotics, automation and production in industry; Production techniques and systems - automation; Enterprise; Market pull and technology push; Sustainability and the environment; Planned obsolescence; Renewable and non-renewable resources; Energy; Modern materials; Smart materials; Composite materials; Technical Textiles; Material properties; The six Rs; Tools, equipment and processes; Quality control; How materials are cut shaped and formed to a tolerance</p>	<p>Graphics work at GCSE is incorporated into RM/PD project work and theory.</p>	<p>Textiles work at GCSE is incorporated into RM/PD project work and theory.</p>	<p>Pastry types - shortcrust, choux, rough puff. Roux based sauces - béchamel &amp; veloute. Eggs - gélatinisation quiche, meringues, pane. Complex meat &amp; fish cookery. Decorated cakes - swiss roll, all in one method, creaming, genoise. Rich yeast dough &amp; breads. Cheesecake, mousse using gelatine. Fresh pasta. Fresh custard.</p>
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<b>Year 11</b>	Non-examination assessment  Theory including: Surface treatments and finishes; Investigate, analyse and evaluate the work of past and present designers/ companies; Isometric and perspective designs; Exploded diagrams; Working drawings; Computer-based tools; Modelling; Planning the cutting of materials to minimize waste; Scales of production	Graphics work at GCSE is incorporated into RM/PD project work and theory.	Textiles work at GCSE is incorporated into RM/PD project work and theory.	Mock CA. mock practical exam. Two course meal dishes - deboning chicken, portioning, accompaniments, garnish, portion control. Theory for Exam.
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The A-level includes mini projects (model making and biomimicry), maths in Product Design, a non-examination assessment and theory including:

Materials and their applications

Technology and cultural changes

Critical analysis and evaluation

Accuracy in design and manufacture

Responsible design

Forming, redistribution and addition processes Health and safety

## **What key capacities/skills will the pupils develop?**

Skills and qualities developed from studying design technology:

### **Technical ability**

You may need particular technical skills and specialist knowledge of how things work or need to be designed and built.

### **Problem solving**

Some jobs particularly require problem solving skills and creative thinking to recognise problems and their causes, to identify a range of possible solutions and then assess and decide the best way forward. To do this, you often need to work as a team so being a good **collaborator** is essential.

### **Organisation**

You'll need to be able to plan and schedule work. This could include being able to prioritise what needs to be done and by when.

### **Communication**

If your job requires verbal communication, you may need to write or give speeches and presentations. For jobs which require written communication skills, you will need to write clearly and convincingly - you could be producing or dealing with legal documents or writing articles for a newspaper. You may also require good listening skills, the ability to negotiate, or to be persuasive.

### **Creativity**

You may need specific artistic or design skills for a job, or you may need to draw on a good imagination to come up with creative solutions to business challenges.

### **Business management**

Some jobs require a good understanding of how businesses work and the management skills to help the business run smoothly and succeed.

### **Analytics**

You'll be collecting and examining information in detail to arrive at a solution, to answer a key question or make an informed decision.

### **Customer service**

Any job which involves contact with customers and the public requires good customer service skills. Whether it's on the phone or face-to-face it's important to be able to make customers feel welcome, to be polite and listen. Interacting with people involves a good **understanding** of human nature and involves displaying a **positive** attitude.

### **Discipline and determination**

You need to know and do what is expected of you. This ranges from organising yourself and being on time, to being responsible. Some jobs need particular skills that require personal discipline and **determination** such as being able to persevere with the task and plans until you accomplish them, or following strict procedures.

## ***Independent investigation***

You need to be able to work by yourself to carry out research when developing your themes and ideas. You also need to investigate key products and important designers. There are opportunities to do this in class but also through homework activities.

Pupils will have opportunities to:

- develop realistic outcomes to assignments
- take increasing responsibility for their own work
- critically evaluate their work and the work of others and suggest improvements
- work individually and in teams, groups, partners or pairs
- work with a range of materials and to use them appropriately
- use a variety of tools safely and correctly
- communicate ideas in a variety of ways
- develop skills and apply knowledge and experience when working on an assignment
- develop the ability to solve problems
- research and record relevant information where appropriate
- examine and evaluate

## **How are the pupils learning and being assessed in this subject? How does the subject support the learning of all pupils?**

Pupils are learning through a wide variety of different tasks following and responding to specific situations.

Teaching material is versatile to suit the students' needs. At KS3 work booklets are used and differentiated material supports the learning (teacher support, personal individual tasks, step by step guides, visual examples, using IT etc). Extension tasks are available for stretch and challenge to reinforce higher level skills in both design and practical situations. All students are encouraged to develop higher order thinking skills through constructive, analytical, comparative and evaluative tasks. KS4 and KS5 pupils follow a specific chosen individual project (NEA - non-examination assessment) along with completing their own theory books for revision. KS3 curriculum content and assessment reflect specifications weighting at KS4, however we have designed programmes of study that extend and deepen students' knowledge skills and understanding. Theory work is taught alongside relevant practical skills.

Pupils work at KS3 is assessed by teacher (effort grade & /10), self and peer assessment along with QUACK (Quality, Use of process, Accuracy, Creativity, Knowledge).

At KS4/5 work is assessed in line with exam board mark schemes and criteria. Individual pupil profile sheets are used to monitor non examination assessment (NEA). SITS (Strengths, Improvements, Targets, Student Comments) are used across the department.

## **How can pupils progress in this subject?**

At KS4 pupils can opt for GCSE Design and Technology (AQA) or Level 1/2 Hospitality and Catering (WJEC). At KS5 pupils can opt for A Level Product Design (AQA). Students may wish to pursue other level 2 and 3 qualifications at alternative education providers (e.g. further education colleges), for example, BTEC or Cambridge Technical in Art and Design, BTEC Engineering Technology.

Many of our students are successful at obtaining university places and modern apprenticeships in various sectors and roles. Successful apprenticeships in the past have included: BAE, Sellafeld - GEN 2, Kimberley Clark, GSK, Williams F1, Tornado Wire, Slacks, Cyclife UK.

University courses that pupils may progress onto with level 3 qualifications in design and technology include:

- Product Design
- Fashion Design
- Graphic Design
- Interior Design
- Textiles
- Creative Technologies
- Materials Science
- Digital Technologies
- Digital Marketing
- Games Design and Development
- Engineering (civil, mechanical, electrical, marine, aerospace, design, automotive, software, agricultural, chemical)

University courses that progress on from qualifications in food and nutrition, hospitality and catering include:

- Food Science
- Food Technology
- Food, Nutrition and Health
- Human Nutrition
- Dietetics
- Food Business Management
- Food Development and Innovation
- Consumer Management and Food Innovation
- Food Manufacture with Marketing
- Events Management
- Environmental Health
- Food Safety, Inspection and Control
- International Hospitality Management

- Agricultural Science
- Food Bioscience
- Sport and Nutrition
- Culinary Arts and Management
- Education

**How does the subject support careers education, information, advice and guidance? What career pathways can pupils take by studying this subject further?**

Design skills and the ability to visualise new ideas can be useful in many job families such as marketing, sales and advertising, arts crafts and design, broadcast media and performing arts, journalism and publishing, construction, as well as engineering and manufacturing.

Design Technology links to a wide and varied range of possible career routes within the following fields:

- Engineering (Civil, Marine, Aeronautical, Electrical, Mechanical, etc.)
- Architecture
- Police - Criminology
- Design CAD Engineer
- Fashion and Graphic Design
- Construction and Building
- Motor Vehicle - technology, manufacturing and repair
- Trade - Plumber, Electrician, Fitter
- Catering and Hospitality
- Event Management
- Photography and Media
- Textile Industry

**How can pupils enrich their knowledge and understanding in this subject?**

The curriculum is enriched with contact with employers, agencies, universities and individuals, who have a wealth of experience and expertise within their specialist area. This gives our students the opportunity to further develop their understanding of the subjects and topics that are studied in each Key Stage.

Regular visitors and contributors to the design and technology curriculum include:

- Rotary Club
- McClures
- Crest Awards
- NSEC Big Bang Competitions - Local, Regional and National

- BAE
- Sellafield
- GSK
- Lecks
- James Fisher
- 3DW
- Slacks
- Cumbria STEM
- Lakeside Hotel
- Furness College

The department runs a large number of clubs and is involved in a number of local, regional and national events:

- STEM
- Rotary Club
- Young Engineers' Association
- Supporting our own Performing Arts department with the production of props and scenery for drama and music productions.
- CREST awards
- Outreach activities working with local primary schools and industry