

# GCSE Product Design: Systems & Control



# Why is Design & Technology so important?

- D&T alongside Maths and Sciences gives you the skills you need for employment in key growth sectors like advanced manufacturing, design, engineering and creative industries
- It is the subject where you have to make decisions, plan and predict, design creative and innovative solutions to problems, evaluate and assess the consequences of your decisions.
- D&T stretches and challenges you and makes you think creatively about many key issues which affect people's lives.
- It will hopefully inspire you to follow a career in areas which are vital for the future of our country and perhaps to be an entrepreneur who designs and makes products that people want.
- It brings real world issues and industry issues into your classroom.
- It helps to prepare you for life in an advanced technological society.



**This is why all students are recommended to continue with their Design and Technology education**

# What are the choices in Design & Technology?

All students take a course in *GCSE Design & Technology: Product Design*.

This is an exciting course which will involve you in activities that develop innovation and flair when designing products. It encourages you as a designer to:

- explore, develop, experience and express your design ideas;
- show flair and imagination;
- work collaboratively and independently;
- use new technology and new materials.

Your learning will be partly focussed on your chosen material area e.g. *food, electronics, textiles* etc. and you will also look at other material areas such as packaging and the design process in general.

# What material areas can I choose?

You can choose to do GCSE Design & Technology: Product Design specialising in one of the following materials areas:

- Food
- Textiles
- Multi Materials
- Graphics
- Systems & Control

Whichever material area you choose, your work will always link with the world of business and manufacturing to make it relevant, challenging and exciting and a good preparation for your future.



# What do all product design courses involve?

All courses involve you designing product ideas, developing models, making prototypes and testing the product. You will work on short timed activities as well as longer designing and making tasks.

You will be encouraged to:

- Combine your making / modelling skills with knowledge and understanding, in order to produce outcomes capable of rigorous tests.
- Recognise that the work of past designers can influence the development of design thinking.
- Use key skills of communication, using numbers, ICT, working with others and problem solving.

# What about coursework and exams?

The course has four units.

The table below gives you information about what is involved in each of these:

| Unit   | Unit Title                             | Type of assessment   | GCSE weighting |
|--------|--|--|----------------|
| Unit 1 | Developing and Applying Design Skills  | Coursework project based on a given project  | 30%            |
| Unit 2 | Design and Make Innovation Challenge   | Students work under exam conditions for a total of 6 hours to complete a design and make project set by the exam board | 20%            |
| Unit 3 | Making, Testing and Marketing Products | Independent coursework project   | 30%            |
| Unit 4 | Designing Influences                   | 1 ½ hour written exam paper  | 20%            |

# Unit 1 : Developing and applying Design Skills

This unit is worth 30% of your final GCSE grade and is all about **designing**

This work is completed in Year 9 at you High School or at the College as controlled assessment (coursework)

During this unit you will design an innovative and creative solution to solve a problem

In this unit you only design the solution you **do not** make it



# Unit 2: Innovation Challenge

This unit is a **practical** examination which is completed during two 3 hour exams

It is worth 20% of your final GCSE grade

It assesses your ability to be **innovative** and to demonstrate flair when you are designing a product and using materials to make the product during the exam





# Unit 3: Making, Testing & Marketing

This unit is worth 30% of your final GCSE grade and is all about **making**

This work is completed in school as controlled assessment (**coursework**)

During this unit you will make a 3D product in your chosen material and produce a photographic record of you making it

You will evaluate how well you have made your 3D product

You will market your 3D product by producing a presentation using a method of your choice

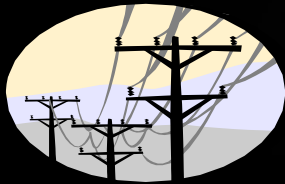


# Unit 4: Designing Influences

This unit is assessed by a 1 hour 30 minute **exam** you will take at the end of Year 10

It is worth 20% of your final GCSE grade

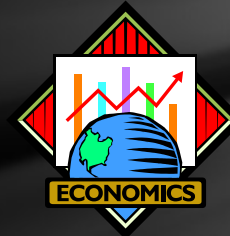
You will learn about a range of different **design influences** as well as **Iconic Designers** and **iconic products**



Energy



Iconic Designs



Globalisation



Sustainability



Marketing



Fashion



Consumer Law

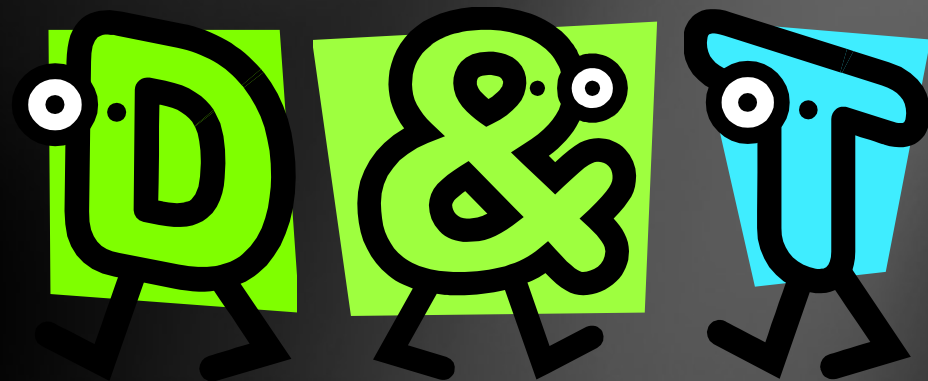


Scientific Advances

# Additional Information

## *What equipment will I need?*

- You do not need any specialised equipment for any of the D&T courses
- If you choose Food as your material you will need to bring ingredients each week
- You will need a data stick for your work
- We will provide all basic materials for the courses but you can pay for additional ones for your projects



# *Progression*

Besides developing a broad base of skills concerning the designing and making of products, this course is an excellent preparation for AS/A Level D&T Product Design. It is also useful for entry into a range of different careers such as for example Architect, Graphic Designer, Product Designer, Engineer, Project Manager etc.

In addition, for students choosing Systems and Control as their material area this course is excellent preparation for AS / A Level Systems and Control and Applied A Level courses. Similarly, it links with Science and IT based courses.

For students choosing Food as their material area this course is an excellent preparation for AS / A Level Food Technology or for Applied A Level courses. It is also useful for entry into food manufacturing or the catering professions.

# Your Systems & Control option

## Why choose Systems & Control as an option?

- Are you interested in the way things work?
- Have you ever wondered what's inside a mobile phone and how it works?
- Are you the type of person that likes gadgets?
- Have you ever wondered how and why racing motor cycles change their gearings for different race tracks?
- Have you ever taken something apart simply to see how it works?
- Have you ever thought about how traffic lights work and how street lights know when to turn themselves on,. How a central heating system works?

# Your Systems & Control option

So what will you do in Systems and control that you wouldn't do in other subjects ?

Well we make things, mechanical things, electronic things a we make and electromechanical device (something which uses electronics to tell a motor to turn on and drive a mechanism.

**Tell me more I here you say!**

# Your Systems & Control option

In Systems we are constantly striving to give students interesting yet challenging practical projects. This means that we review our products on an annual basis. Currently students start their practical experience by producing a mechanical tortoise that nods its head as it is pushed along. The tortoise demonstrates the four types of movement, rotary, reciprocating, oscillating and linear. Can you see where each type of movement can be seen?



# Your Systems & Control option

The focus next shifts to electronics and the use of CAD/CAM. For Christmas students produce a Christmas tree decoration that constantly flashes LED's on and off. Each student selects their own design with a Christmas theme in mind. Their design is cut out on a laser cutter, placed onto a box which students also make.

The decoration is completed via the addition of an astable circuit (a circuit that flashes the LED's on and off).





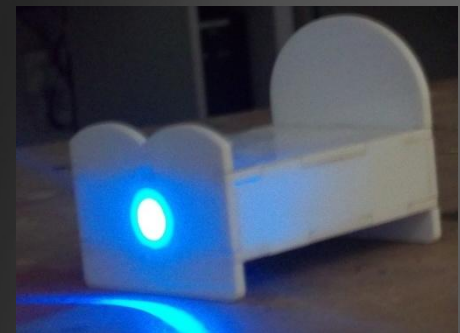
# Your Systems & Control option

Following the Christmas tree decoration students knowledge is further enhanced by a night light project. The night light is a high quality product . Previous students have commented on how it looks like a product you would buy in the shops.

## *So what is it?*

Well it's a sensing circuit that turns a bright blue LED on when the lights go out or when it gets dark. The circuit keeps the LED on for a period of 30 minutes before slowly going out. The circuit is placed within a bed shaped laser cut package.

Students often go on to produce their own packaging for this product which adds to its appeal.



# Your Systems & Control option

Finally to give students experience of how electronics and mechanisms can work together they make a money box.

Well not just any money box . This one moves when a coin is inserted.

The project starts with students creating a circuit that senses the impact of a coin. When this happens the circuit turns a motor on for 10 seconds. The motor is used to drive a mechanism which the student designs and makes themselves.

Students use a basic kit for the carcass of the moneybox then design what they want to move and how they intend to produce that movement.

