

AQA DESIGN AND TECHNOLOGY GCSE

The GCSE Technology course has recently changed from discrete subjects into one new subject with a title of Design and Technology. This PowerPoint aims to show you how the new course works and what you study over the two years of Key Stage 4.

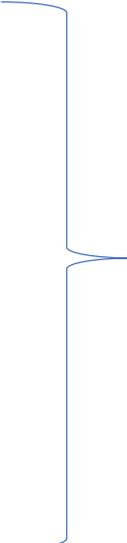
Resistant materials

Electronics

Graphics

Textiles

GCSE Design and
Technology



The new GCSE divides into three sections

1. [Core technical principles](#)
2. [Specialist technical principles](#)
3. [Designing and making principles](#)

All pupils study the core principles gaining knowledge and understanding that allow them to make effective design choices.

Pupils study technical principals, again to help make effective design choices. This work is covered in a specialist area:
Resistant materials – Graphics –
Electronics - Textiles

This work is undertaken in year 11 of the course and is a design and make project. This is the coursework element of the subject worth 50% of the GCSE grade.

The following pages has more detail on each section

Core technical principles

- New and emerging technologies →
 - How technology is used in manufacturing
 - How it effects people / society
 - How it effects the environment
- Energy generation and storage →
 - How energy is generated and stored
 - How this impacts on the environment
 - The advantages/disadvantages of the different methods
- Developments in new materials →
 - Modern materials have had a massive impact on everyday products we buy and use. This section looks at 'smart materials' and how they can be used to make effective design choices
- Systems approach to designing →
 - This looks at the basic principles of electronic design.
 - Using input devices to sense – light, sound or temperature to switch output devices LEDs, motors, buzzers etc.
- Mechanical devices →
 - The use of mechanical devices to change the speed/power and direction of movement
- Materials and their working properties. →
 - How materials are used in the designing and making of a product. What is the best material for the product and why is it the best

Specialist technical principles

At this point the pupils can specialise in one of the areas shown below

- RESISTANT MATERIALS
- ELECTRONICS
- GRAPHICS
- TEXTILES

The choice will usually be made during the option process depending on the number of pupils for each area.

The subject is taught by completing a number of mini projects in Year 10 which will always involve various levels of resistant materials, electronics and graphics.

The exception is textiles which we offer as a separate option.

The following page shows an example of a Year 10 project that is initially based in graphics. It shows how all the elements integrate as the project progresses.

Design Brief

Design and make a personalised name plate that will be used as wall art on a wall in the house. The personalisation can be a name or phrase that has meaning to the customer.

Market Research

 My first search on the internet under wall art found this picture on the left. I was instantly drawn to its simplicity and minimalism. The other designers in the group also found the image appealing. By adding a name of specific phrase could instantly personalise this work. The image could possibly be created in 3D and then lit to for a moving shadow. The image could be back lit so it glows.

The image on the right offers the ultimate in personalisation as it is a chalk board. This was taken from 'Not on the High Street' and cost is £20. The shape of a hedgehog could easily be changed or offered in a number of different animals. The eye looks painted on but a 'googly' eye could be used to give the board a depth.



 quite big. It is from 'Not on the High Street' and cost is £20. The shape of a hedgehog could easily be changed or offered in a number of different animals. The eye looks painted on but a 'googly' eye could be used to give the board a depth. The image could be back lit so it glows. Different coloured lights could be used to make a changing picture. A simple phrase or name could be added to personalise the wall art.

Analysis of Research

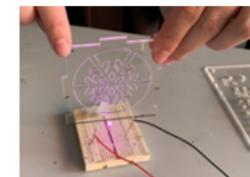
Using the market research initial testing and experimentation looks at elements that can be considered as part of the design and development of the product. This has introduced materials and electronics into the project

A design situation is identified. The one shown was to make a piece of personalised wall art.

Research is then carried out to investigate and analyse what already exists on the market.

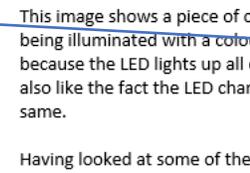
The example was offset by 0.15mm.

This experiment helps to show a number of techniques that I could use and develop in my design work.

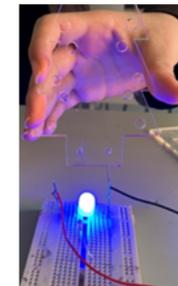
 This image shows a piece of clear plastic cut on the laser cutter with an LED illuminating the bottom. I like this idea as it looks really good and it is something I will consider as I start to design and develop my ideas. Using this technique will rely on some form of electronics within the wall hanging.

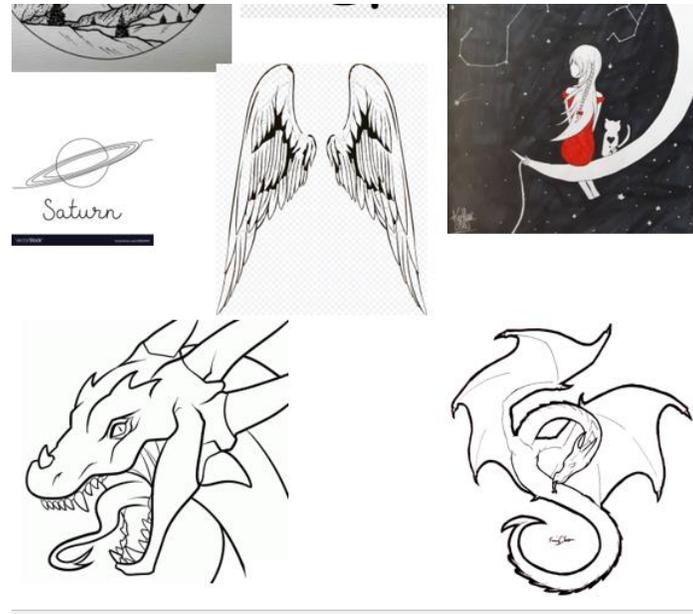
 This image on the right shows the spray paints that outline the letter 'A'. We cut the letter 'A' out with the laser cutter and sprayed it with the spray paint. Also, the second spray painted 'A' has been moved in different places while being painted. I think I could use the first style on my final piece for the writing.

 The image on the left shows a variety of plastics that were used. We tried all of them with different colours of LED's to see which one we liked the best. They were all misty so when we used an LED behind them to backlight it, you could see the colour but not the actual LED. Looking at the range of colours will help me consider what options are available in school as I start to design.

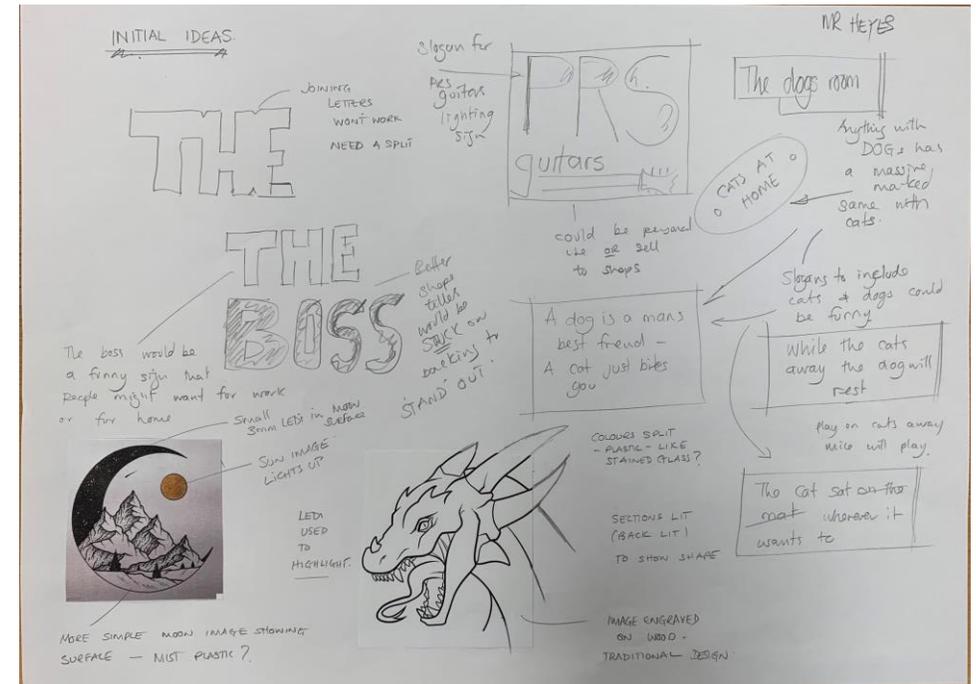
 This image shows a piece of clear plastic which has been cut out on the laser cutter and is being illuminated with a colour changing light (right now on blue). I like the idea of this because the LED lights up all of the edges adding an interesting style to the Christmas tree. I also like the fact the LED changes colour because the Christmas tree will not always look the same.

Having looked at some of the materials and processes that are available I will now start to consider how this will influence my thoughts and ideas of what my design could start to look





Using the information researched about materials etc an image board is used to help with design and development. The images are used to generate a design sheet to investigate possible solutions to the initial situation.



Experimenting with a frame for my design

Having looked at some initial ideas I will need to investigate how the product will be held in place. It could be free standing or held in a frame. I have manufactured a simple frame to help me assess my options for my final product.

The frame was accurately measured to allow a clear Perspex front to be laser cut (3mm).

The inside of the frame has a 6mm bead which is used as a support for the front board and picture.

The back was added using 3mm hard board. Screws allow access to the circuit.

The frame was manufactured from PINE so was easy to cut and join. The joint was a BUTT complete with PVA glue to hold it solid.

I enjoyed the process of manufacturing the frame and was careful to measure as accurate as possible. By joining the two opposite sides of the frame and sanding them together it made it much easier to make a square box. I sanded the external surface of the frame to also make it a really accurate finish. The laser cutting of the inside panel was easy and

Practical research on the best way to manufacture the product is completed.



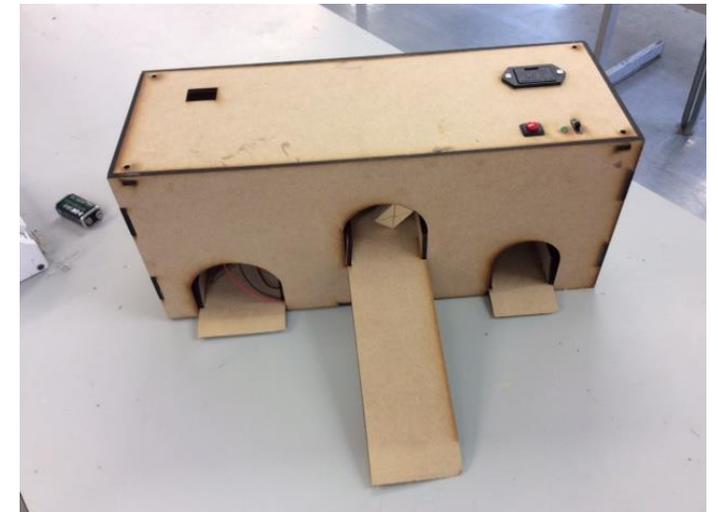
The picture shows an example of the finished project and how the Design and Technology now works. Initially graphics based it has encompassed the following elements of Design and Technology:

- IDENTIFICATION OF PROBLEM/SITUATION
- RESEARCH AND ANALYSIS
- SPECIFICATION
- DESIGN AND DEVELOPMENT WORK
- RESISTANT MATERIALS - wood – plastic – shaping and joining materials – using tools and equipment safely – Computer Aided Design and Computer Aided Manufacture
- ELECTRONICS – the circuit is activated by light – a time delay and sequencing programme is used – the output lights (LEDs)
- GRAPHICS – the use of graphics in the design and production
- MICROCONTROLLER – computer programming to operate circuit
- EVALUATION OF FINISHED PRODUCT

Design and making principles

This involves designing and making a project in a similar way to the example shown previously. The project has a portfolio and practical element and is worth 50% of the GCSE grade. It is marked by the teacher and externally moderated.

The following pictures are taken from previous years GCSE practical work.



Assessment

The course is assessed in two ways:

1. A 2 hour written exam at the end of year 11 (100 marks worth 50% of the GCSE grade).

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.

2. None Examined Assessment (NEA) – Coursework portfolio and practical worth 50% of the GCSE grade.

How it's assessed

Non-exam assessment (NEA): 30–35 hours approx.

100 marks

50% of GCSE