



Design and Technology

Year 10 Options

The GCSE Resistant Materials pathway builds on the Key Stage 3 programme of study for Design and Technology. The course also allows for progression to post 16 in preparation to A'Level or BTEC courses. The 2 year course allows pupils to gain subject knowledge, design and making skills, and ICT, particularly in Resistant Materials using a wide range of different materials and manufacturing techniques. Pupils will produce several quick products throughout the course culminating in the production of a final coursework project consisting of a 3-dimensional product/s and a concise design folder and / or the appropriate ICT evidence.

Final design coursework will consist of approximately 40 hours of work by each student producing approximately 20-25 concise A3 sheets of work.

Pupils will take a written paper at the end of the course (Full Course)

Coursework - 60% of total marks

Written Paper - 40% of total marks

This first year of the two-year course deals with the students acquiring the underpinning skills that are essential to their success in both the written paper and the controlled assessment. The course should be carefully planned to ensure that they are taught the underpinning skills that are the foundation of the Resistant Materials course.

The underpinning skills are:

Practical skills

Theoretical knowledge

Drawing skills

Designing skills

Modelling skills

Computing skills

Autumn term: Aim- to develop designing and presentation skills

Focus: Plastics

The Clock Project

Design Brief

To design a small acrylic clock suitable for a teenager.

Description

Students will manufacture a free standing or wall mounted clock. The main material will be acrylic sheet. The acrylic will be shaped using a coping saw and a range of files and a hand-drill. The strip heater may be used. The overall finish must be as close to professional as possible. Pupils will focus on presentation and sketching techniques and further develop their practical skills in working with plastics.

Appropriate research opportunities

Research a range of existing clocks.

Multi Materials opportunities

Acrylic sheet is used for the main parts but other materials could be used for particular effects. Card is used for modeling.

Opportunities to manufacture in quantity

The card model will be used as a template to aid in the marking out of the acrylic sheet.

This method could be used for batch production.

Industrial applications, systems and control

The use of computer-controlled machinery such as the laser cutter demonstrates the possibility of producing a series of identical products. The clock mechanism itself is a mass-produced product.
A professional finish is discussed and demonstrated especially when polishing the edges of the acrylic but also the need for care and accurate working at every stage. Quality-control processes.
Plastic forming methods demonstrated. Advantages and disadvantages of plastics discussed.

Spring term: Investigating, researching and analyzing

Focus: Wood

Kitchen utensils container Project

Design Brief

To design a small wooden container for kitchen utensils

Description

Pupils will design a small wooden container for kitchen utensils. The main material used will be pine with a hardwood detail. Pupils will learn about different wooden joints and use one to make their box. They will learn about different wood finishing techniques and select one suitable for their final product.

Appropriate research opportunities

Research a range of kitchen accessories

Multi Materials opportunities

Pine is used for the main parts but other hardwood could be used to add details

Industrial applications, systems and control

The use of computer-controlled machinery such as the laser cutter demonstrates the possibility of producing a series of identical products.

Further Investigation of Natural timber, Manmade boards, Sustainability of wood, Woodworking tools, Composite materials, Smart materials and Nanomaterials

Summer term:

Focus: Metal

Metal key fob project

Design Brief

To design a small key fob for a special occasion

Description

Pupils will design a small metal key fob for a special occasion. The main material used will be copper.

They will investigate Workshop safety, Property of materials Metals (ferrous) Metals (non ferrous) Sustainability of metals Metalworking tools, Joining metals and techniques used for Finishing metals

Appropriate research opportunities

Research a range of key fobs and fashion accessories

Multi Materials opportunities

Copper is used for the main parts but other metal could be used to add details

Industrial applications, systems and control

The use of computer-controlled machinery such as the laser cutter demonstrates the possibility of producing a series of identical products.

A professional finish is discussed and demonstrated especially when polishing the

edges of the metal but also the need for care and accurate working at every stage.

In the summer term pupils will finally start their Major project which will focus on their acquired skills in the 3 mini projects.

<http://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-resistant-materials-4560/teaching-and-learning-resources>

<http://www.bbc.co.uk/schools/gcsebitesize/design/>

<http://www.design-technology.info/revisionguides/>