Key Stage 3 Design Technology

Curriculum Map

3-year Curriculum

Off to GCSE

Diet

Diet through life and preparing for KS4

Food

Chair Modelling

Design and manufacture a model chair based around a designers theme using practical techniques, CAD/CAM, develop understanding of modelling materials, client need and, quality controls and finishes

Technical drawing

Recycled Lamp

To manufacture a working lamp using a photocell and recycled plastic materials, develop understanding of the 6 R's, build on materials knowledge, understanding of product obsoleting and repurpose needs and machine processes.

Graphics

Decorative Box

Design and manufacture a decorative box using woodworking techniques, tools and machinery, develop understanding of jigs, manufacturing processes client need and, quality controls and finishes

Product design

Formal drawing and CAD

Development of key CAD/CAM process design packages and applications. Development of technical drawing skills, rendering, Freehand and perspective.

Product design

Year 9: Transition to skills required at GCSE

Amplifier

Develop understanding of soldering techniques to produce a working amplifier . Present laser cut Cam nets to contain and display circuit using influence of various design movements

Electronics

Cushion

To design and make a textile cushion using basic sewing machine skills, develop knowledge of client needs, textile production methods and stencilling techniques.

Textiles

Shop Front

Use creative techniques to develop own ideas for 3d shop front, use technical drawing skills to produce orthographic projections and 3d modelling techniques.

Graphics

Pewter

Design and make a pewter pendant, Develop understanding of casting processes and metals, CAD/CAM mould design processes, Focus on client needs

Product design

Nutrition

Nutrition and staple foods,
Food miles

Food

Year 8: Investigate and modify key skills

Basic Skills

Basic skills, getting to know the food room and Eatwell guide

Food

Structures

Understand how structures are designed and how key forces are applied, focus on renewable energy and recycled materials.

Product design

Mirror Frame

Design and manufacture of adjustable mirror frame using key woodworking skills, Cad/Cam and mechanisms. Understanding of health and safety and manufacturing techniques.

Product design

Sock Monkeys

To design and make a textile character using basic sewing techniques, develop knowledge of client needs, textile template production and other key techniques.

Textiles

Card Mechanisms

Develop understanding of different types of mechanisms, motions and key forces, applying 3d modelling skills.

Graphics

Year 7: Stretching the skills from Primary

GCE Engineering Product Design (Level 3)

Apprenticeships in Engineering (Levels 2 & 3)

Vocational Qualifications Engineering (Levels 1 & 2)

Key Stage 4 DT

OCR Engineering Design

Curriculum Map

2-year Curriculum

Off to your future

OCR Engineering Design Unit 105

Design Briefs, design specifications and user requirements

Exam 25% Design briefs, design specifications and user requirements

Coursework25%Product analysis and research

OCR Engineering Design Unit 107

Developing and presenting engineering designs

Coursework25%Developing and presenting engineering designs

Coursework25%3D design realisation

Exam

OCR Engineering Design Unit 106

Product analysis and research

OCR Engineering Design Unit 108

3D design realisation

Year 11

Autumn 1 Designing an mp3 amplifier using formal drawing techniques

Autumn 2 Presenting a final design for an mp3 amplifier using cad and rendering

Spring 1 Planning to safely manufacture design

Spring 2 Manufacturing prototype amplifier to design specification and evaluating outcome

Summer 1 Revise and practice exam papers in preparation for 1 hour exam

Unit 107 Amplifier design

Developing & presenting engineering drawings of amplifier using various techniques and annotation. Use CAD software to communicate proposals.

Unit 108 Amplifier manufacture

3D design realisation of amplifier. Understand safe working practices when prototyping. Evaluate the success of a prototype.

Unit 107 Amplifier design

Developing & presenting engineering drawings of amplifier

Generate designs using range of techniques

Unit 108 Amplifier manufacture

3D design realisation of amplifier. Plan the making of a prototype.

Unit 105 Exam: Design briefs, specifications and user requirements

Exam preparation and revision

Summer 2 Analysing components and manufacturing processes

Summer 1 Investigating the manufacture of products

Spring 2 Experimenting with materials to produce adjustable tablet stand.

Spring 1 Investigating design requirements of an adjustable stand for a tablet/phone

Autumn 2 Planning and manufacturing a high quality product for a client

Autumn 1 Preparing a brief, specification and design solution to a situation

Year 10

Unit 106 Games controller

Product analysis and research of game controllers. Production methods, quality and legislation.

Tablet Stand

Investigating a problem and exploring opportunities. Considering materials and processes available. Incorporating unit 105 content.

Clock Design

Investigate the work of others and designing a product for a client. Using various forms of presentation drawings. Incorporating unit 105 content.

Unit 106 Games controller

Research existing products

Analysing existing products through disassembly

Tablet Stand manufacture

Modelling solutions, combining materials, using cad/cam, testing and modifying outcomes

Clock Manufacture

Preparing for manufacturing and workin safely using a variety of processes including cad/cam. Testing and evaluating outcomes.

THE PRESCOT SCHOOL

IN THE BUSINESS OF LEARNING - SINCE 1544

The Prescot School Subject Overview for

Design Technology Year 7

Head of Department
Mr D Corran

Number of lessons per fortnight

For Key Stage 3	3
For Key Stage 4	6

1 Course/Subject introduction

Throughout the year pupils are introduced to a range of materials and processes through a series of projects. They are taught health and safety within each project and are challenged to produce high quality outcomes following the design process. They are introduced to tools and equipment including cad cam and are encouraged to show creativity in their work.

2 Course/project rotations

Mirror Design	Pupils are introduced to the workshop to complete a design and make project to manufacture a movable mirror using acrylic, softwoods and manufactured boards. They use cad/cam in the design and manufacture of their product and test and evaluate their work as they progress. They are taught about safe use of tools and machinery and are encouraged to solve problems as they develop their designs.
Structures	Pupils investigate a range of structures and are then challenged to work in teams to build a bridge using art straws which is then tested for strength. They work collaboratively to solve problems and work with materials to economically produce a strong structure. They also investigate renewable forms of energy and again work in teams to design and develop a wind turbine which is tested to assess efficiency.
Paper Mechanisms	Pupils design a promotional item for a client using paper and card mechanisms. They produce a specification in response to a design brief and work creatively to formulate ideas. They investigate forms of motion and graphical presentation techniques in order to design and develop a fully functioning promotional leaflet using a range of paper mechanisms for impact.
Textiles	Pupils design and make a Sock Animal for a client of their choosing. They develop basic sewing skills, how to use the equipment safely,

	design skills and how to respond to a design brief. Pupils investigate existing products, analysing and using ideas to create initial ideas. They will use this knowledge to develop and make their own creative sock animals.
Food	Pupils will develop their knowledge and understanding of ingredients and healthy eating; They will develop food preparation and cooking techniques, and their knowledge of consumer food and drink choice; Pupils will be able to apply their knowledge to make informed choices; They will develop the creative, technical and practical expertise needed to perform everyday tasks confidently; Pupils will build and apply a repertoire of knowledge, understanding and skills in order to design and make high quality products for a wide range of users; Pupils will evaluate and test their ideas and products and the work of others.

3 Recommended texts or websites to support home learning

https://www.bbc.co.uk/bitesize/subjects/zfr9wmn
https://www.foodafactoflife.org.uk
http://www.technologystudent.com

4 Specialist equipment/materials required if applicable.

Pupils are provided with specialist tools, equipment and materials during lessons. They are required to bring in ingredients for food practical lessons. To help develop designing and sketching skills it is recommended that pupils have an A4 blank sketchbook at home to practice.

THE PRESCOT SCHOOL

IN THE BUSINESS OF LEARNING - SINCE 1544

The Prescot School Subject Overview for

Design Technology Year 8

Number of lessons per fortnight	
For Key Stage 3	3
For Key Stage 4	6

Head of Department
Mr D Corran

1 Course/Subject introduction

Throughout this year pupils are introduced to more techniques and processes in each project area. They build upon their skills and knowledge from year 7 and incorporate them into their project work. They investigate real word problems and creatively design and make to produce high quality outcomes. They modify their work and evaluate in order to suggest improvements to their outcomes.

2 Course/project rotations

Pewter Casting	Pupils use biomimicry to help influence the design of a piece of jewellery. They design and develop ideas using creative techniques and use cad to prepare a mould for their work. This mould is then laser cut and moulten pewter is cast into it. Pupils then use a range of finishing techniques to complete their decorative jewellery design.
Amplifier Circuit	Pupils are introduced to electronics and soldering processes. They practice safe soldering and identify components to assemble a working amplifier circuit. They research design movements to provide inspiration for decoration to the circuit container. They then assemble their speaker using a laser cut card net which reinforces the sound levels and presents their work creatively.
Shop Front Modelling	Pupils investigate the high street shopping experience and formulate their own brief and specification for a new business venture. They investigate corporate logos, branding and iconic designs and use this to inform their own proposals for their chosen business. They investigate modelling materials and accurately manufacture and present a scaled 3D shop front design for their business. They present their work and evaluate their outcomes using others feedback.
Textiles	Pupils use countries and cultures as a starting point to design and

	make a cushion for a specific client. Pupils experiment with colour and textile techniques such as tie dye and print. They will sample techniques in order to gain an understanding of the processes, they will then use the skills developed to produce a cushion design and a final cushion.
Food	Pupils will deepen their knowledge and understanding of food and nutrition; Pupils will further develop food preparation and cooking techniques. They will deepen their knowledge of consumer food and drink choice and will be able to apply their knowledge to make informed choices; Pupils will develop the creative, technical and practical expertise needed to perform everyday tasks confidently and will build upon their practical skills order to design and make high quality products for a wide range of users. Pupils will evaluate and test their ideas and products and the work of others.

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THE PRESCOT SCHOOL

IN THE BUSINESS OF LEARNING - SINCE 1544

The Prescot School Subject Overview for

Design Technology Year 9

Head of Department
Mr D Corran

Number of lessons per fortnight
For Key Stage 3 2
For Key Stage 4 6

1 Course/Subject introduction

Throughout this year pupils continue to develop their skills and knowledge in preparation for KS4. They continue to solve real world problems and work with a range of materials and techniques to produce high quality outcomes. During this year they become aware of KS4 choices within Design Technology and can select an appropriate range of courses to follow in year 10 and 11.

2 Course/project rotations

Recycled Lamp	Pupils investigate a wide range of plastic processes and study the 6 R's in relation to the products they may make. They become aware of the lifecycle of plastics and how upcycling can help with environmental concerns surrounding the disposal of materials. Pupils work with recycled materials in order to design and manufacture a creative lamp. They investigate electronic components and use a photocell to control the lamp.
Decorative Box	Pupils study scales of production and timber joining processes. They work in teams to produce a decorative box using aids to production such as jigs and templates which they have designed themselves. They investigate and test a range of finishes which are then applied to their finished product.
Chair Design	Pupils investigate design movements, ergonomics and anthropometrics in relation to the design of products. They formulate a design brief and specification for a creative chair design and then design and develop a solution which is modelled using a variety of modelling materials. They present and evaluate their work and suggest improvements to their solution following feedback from others.
Graphical Presentation Techniques	Pupils work with a variety of presentation techniques including orthographic, isometric and oblique drawings. They also use perspective and investigate rendering objects using colour, tone

	and shade. They work with cad to present work accurately and use full annotation and labelling in their work to inform 3rd party users. They work to scale and use dimensioning and tolerances when labelling their work.
Food	In year 9 pupils will focus on dietary needs throughout the life stages. They will produce products using different preparation techniques and methods when cooking a variety of different skills and present them to a high standard. The pupil will be able to select and adjust cooking times. They will Judge and modify sensory properties (Change the taste and aroma through the use of herbs and spices. Presentation of food through garnishes and careful assembly.) They will demonstration of awareness of health and safety at all times. They will also gain an awareness of where food comes from, food miles and nutrition labelling.

3 Recommended texts or websites to support home learning

https://www.bbc.co.uk/bitesize/subjects/zfr9wmn
https://www.foodafactoflife.org.uk
http://www.technologystudent.com

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THE PRESCOT SCHOOL

IN THE BUSINESS OF LEARNING - SINCE 1544

The Prescot School Subject Overview for

Design Technology Year 10

Head of Department
Mr D Corran

Number of lessons per fortnight	
For Key Stage 3	3
For Key Stage 4	6

1 Course/Subject introduction

Throughout the year a series of projects and tasks prepare the pupils for the OCR Design Engineering qualification. This qualification is 75% coursework and the tasks covered in year 10 prepare the students to tackle the assessment requirements confidently utilising their skills and knowledge so far attained in Design Technology.

2 Course/Subject structure

Term 1 Clock Manufacture	Pupils follow the full design and make process for a product to suit a client. They engage in research, analysis and prepare a fully detailed specification for their product. They are challenged to use creative design techniques and knowledge of processes to model and propose a suitable final design. They use various formal presentation techniques to communicate their work and then plan for manufacture using industrial planning techniques. They manufacture their product accurately using a range of materials and processes safely including cad cam and modify work where necessary to improve the outcome. They test and evaluate their product using 3rd party feedback to inform of future improvements. They evaluate their own performance and identify possible areas of improvement.
Term 2 Adjustable Tablet Stand	Pupils identify materials and processes in this project. They design and make a workable solution to a real world problem and are challenged to develop their skills by using different materials and processes including cad cam to those they used in the term 1 project. They model and present solutions and test before a manufacturing specification is prepared which would allow for large scale production of their proposed design solution. They manufacture and modify work to improve their outcomes and complete full evaluations of their product and their work.

Term 3 Game Controller	Coursework Unit R106: Product analysis and research *This unit will enable pupils to perform effective product analysis. They will research existing solutions and assess the development of engineered products. Learners will develop dextrous skills and gain practical experience of product assembly and disassembly to appreciate manufacturing processes, design features and materials used. This unit develops learner's creativity and critical analysis through an understanding of the principles behind good design. They will consider what makes a good product sell by analysing existing solutions. On completion of this unit, learners will understand how to perform effective product analysis and evaluation through research and product assembly and disassembly procedures to appreciate product design features.*

3 Recommended texts or websites to support home learning

https://www.bbc.co.uk/bitesize/guides/zh4g4qt/revision/1
https://www.bbc.co.uk/bitesize/subjects/zvg4d2p
https://www.bbc.co.uk/bitesize/articles/z7n4bdm
http://www.technologystudent.com

4 Specialist equipment/materials required if applicable.

As the course has an examined unit worth 25% of the overall mark any DT GCSE revision guide would be suitable for revision. Also, due to the graphical nature of the coursework an A3 sketch book with drawing tools would be a useful resource for working at home developing presentation skills.

THE PRESCOT SCHOOL

IN THE BUSINESS OF LEARNING - SINCE 1544

The Prescot School Subject Overview for

Design Technology Year 11

Head of Department
Mr D Corran

Number of lessons per fortnight
For Key Stage 3 3
For Key Stage 4 6

1 Course/Subject introduction

Throughout the year a series of coursework units are completed that contribute to the coursework element of the OCR Cambridge National Certificate in Engineering Design. These 3 coursework units contribute 75% of the award marks. Alongside these units a further unit is covered which is examined in a 1 hour exam which is worth 25% of the overall award marks. This qualification is awarded at pass, merit and distinction levels and is equivalent to a GCSE qualification levels 4-6.

2 Course/Subject structure

Term 1 Amplifier Case Design	Coursework Unit R107: Developing and presenting engineering designs *This unit develops techniques in generation, concept development and the communication of design ideas using hand rendering and computer-based presentation techniques including computer aided design software. Learners will generate design ideas using a mixture of detailed hand rendering and computer-based presentation techniques including computer aided design in 2 and 3 dimensions. Learners will gain skills in annotation and labelling techniques, such as showing key features, functions, dimensions, materials, construction/manufacture methods. On completion of this unit, learners will have developed knowledge and understanding of how to communicate design ideas through hand rendering and computer-based techniques.*
Term 2 Amplifier Case	Coursework Unit R108: 3D design realisation *This unit requires learners to apply practical skills to produce a prototype product or model using craft-based modelling materials alongside computer-controlled or rapid-prototyping processes. Learners will produce a prototype product in the form of a model and test design ideas in a practical context, to inform further development utilising more complex production processes. Learners*

Manufacture	*will evaluate the prototype making a comparison of the outcome against the product specification and evaluate potential improvements in design such as features, function, materials, aesthetics and ergonomics and make suggestions on improvements to the final product. On completion of this unit, learners will be able to use knowledge gained to apply practical skills in the use of tools and equipment to produce a prototype.*
Term 3 **Exam**	Exam Unit R105: Design briefs, design specifications and user requirements. *This unit provides the opportunity for learners to develop their understanding of the requirements of design briefs and design specifications for the development of new products. Through research and practical activities, learners will understand how consumer requirements and market opportunities inform design briefs. Learners will understand the overall design process through study of the design cycle, existing product and life cycle analysis, study of new and improved materials and manufacturing processes, and how these and other factors influence a design solution. On completion of this unit, learners will understand the design cycle, the requirements for a design brief and design specification for the development of a new product and how effective research data is necessary to inform the development of a design solution.*

3 Recommended texts or websites to support home learning

https://www.bbc.co.uk/bitesize/guides/zh4g4qt/revision/1
https://www.bbc.co.uk/bitesize/subjects/zvg4d2p
https://www.bbc.co.uk/bitesize/articles/z7n4bdm
http://www.technologystudent.com

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