CoDA Curriculum

DESIGN & INNOVATION

Improving the life chances of all students

Students in Year 10 and 11 may study the following specification(s):

OCR Nationals Level 1/Level 2 Engineering

OCR Nationals Level 1/Level 2 in Creative iMedia

Pearson Edexcel Level 1/Level 2 GCSE (9-1) in Business

AQA Level 1/Level 2 GCSE (9-1) in Design and Technology

AQA Level 1/Level 2 GCSE (9-1) in Food Preparation and Nutrition

AQA Level 1/Level 2 GCSE (9-1) in –Textiles (Art and Design)

WJEC Level 1/2 Vocational Award in Constructing the Built Environment

WJEC Level 1/2 Vocational Award in Hospitality and Catering

Why study Design & Technology?

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, students design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Students learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

Design & Technology Curriculum INTENT Y7-9 (based upon the National Curriculum, 2013)

The Design & Technology Curriculum aims to ensure that all students:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook

<table>
<tr><th colspan="4">Designing & Making</th><th>Cooking & Nutrition</th></tr>
<tr><td colspan="4">Through a variety of creative and practical activities, students should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of domestic and local contexts [for example, the home, health, leisure and culture], and industrial contexts (for example, engineering, manufacturing, construction, food, energy, agriculture and fashion).</td><td>As part of their work with food, students will be taught how to cook and apply the principles of nutrition and healthy eating. Learning how to cook is a crucial life skill that enables students to feed themselves and others affordably and well, now and in later life.</td></tr>
<tr><td colspan="4">Students will be taught to:</td><td>Students will be taught to:</td></tr>
<tr><th>DESIGN</th><th>MAKE</th><th>EVALUATE</th><th>TECHNICAL KNOWLEDGE</th><td rowspan="2">• understand and apply the principles of nutrition and health
• cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet
• become competent in a range of cooking techniques, for example: selecting and preparing ingredients; using utensils and electrical equipment; applying heat in different ways; using awareness of taste, texture and smell to decide how to season dishes and combine ingredients; adapting and using their own recipes
• understand the source, seasonality and characteristics of a broad range of ingredients.</td></tr>
<tr><td>• use research and exploration, such as the study of different cultures, to identify and understand user needs
• identify and solve their own design problems and understand how to reformulate problems given to them
• develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations
• use a variety of approaches, to generate creative ideas and avoid stereotypical responses
• develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools</td><td>• select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture
• select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties</td><td>• analyse the work of past and present professionals and others to develop and broaden their understanding
• investigate new and emerging technologies
• test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups
• understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists</td><td>• understand and use the properties of materials and the performance of structural elements to achieve functioning solutions
• understand how more advanced mechanical systems used in their products enable changes in movement and force
• understand how more advanced electrical and electronic systems can be powered and used in their products
• apply computing and use electronics to embed intelligence in products that respond to inputs, and control outputs, using programmable components.</td></tr>
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CoDA DESIGN & INNOVATION Curriculum Year 7-9

	Rotation 1	Rotation 2	Rotation 3	Rotation 4	Rotation 5
Y9	**CAD – Fusion 360 – 2019/2020 only** Using tutorials to complete complex 3D designs in Fusion 360 • Give a description of CAD/CAM uses. • Navigate around Fusion 360. • Demonstrate how to create a new assembly and add components. • Understand a working drawing. • Apply your knowledge of CAD tools to make parts independently.	**Wood - Lamp** Knowledge of woods, using iterative design principles, origin of wood, timber manufacture • Name and describe the properties of different woods. • Name and explain why a variety of joints are used. • Analyse a design brief effectively. • Communicate my ideas with drawings and labels. • Safely manufacture a product. • Complete an evaluation of my product.	**Food & Nutrition – The Science of Food** Weekly exploration into the science of food products, raising agents, pasta and pastry skills • Keep myself and others safe in the food room. • Used my senses to plan and evaluate different foods. • Describe aspects of food science using a range of technical words. • Describe the function of a range of ingredients. • Prepare a range of foods.	**Textiles – Japan** Responding to Japanese brief, cultures, natural fibres, difficulty vs synthetic, evaluation. • Describe how various decorative techniques are achieved. • Describe how textiles are constructed. • Respond to a given design brief in a creative way. • Create and present my design ideas clearly. • Produce a piece of Shibori tie-dye to my own design. • Apply my practical skills to make a prototype.	**Business Studies – Planning a Business** Planning a business, market research, marketing, budgeting & finance, branding, job roles • I can identify my own skills • Describe key roles in a business or team. • Explain how budgeting and finance work in businesses. • Carry out market research • Write a business plan and brand your business. • Use my presentation skills to pitch my business.
Y8	**Electronics Speaker** 2D Design CAD, PCB design in Circuit wizard, Soldering, Laser cutting • Use 2D design to draw a speaker case design. • Calculate the value of resistors. • Name and describe the function of a variety of electrical components. • Use Circuit Wizard to model the speaker circuit. • Safely and accurately solder components onto a PCB.	**Plastics - Clock** Knowledge of Plastics, designing for specific users, origin of plastics, plastics manufacture • Name and describe the properties of different plastics. • Analyse existing products. • Communicate my ideas with drawings and labels. • Safely manufacture a product. • Describe and evaluate the use of plastics and some methods of manufacture. • Complete an evaluation of my product.	**Food & Nutrition – World foods** Product evaluation, H&S, factors - food choice, nutrients, food safety, social / moral issues • Recall the names of nutrients; discuss sources and functions. • Explain how bacteria can be reduced; know key temperatures. • Discuss why people choose to eat different foods. • Compare foods from different sources; discuss advantages and disadvantages. • Prepare a range of main meals and snacks.	**CAD – Fusion 360** Using tutorials to complete complex 3D designs in Fusion 360 • Give a description of CAD/CAM uses. • Navigate around Fusion 360. • Demonstrate how to create a new assembly and add components. • Understand a working drawing. • Apply your knowledge of CAD tools to make parts independently.	**ICT – iMedia and Python** Data storage, Binary, Python, input > Process > output systems model, image manipulation • Describe inputs, outputs and data storage on computers. • Convert decimal numbers to binary and back. • Use Python to construct computer programs. • Understand how images are stored on computers. • Use graphical techniques to produce an image.
Y7	**Mechanisms & Forces** Cams, levers, forces, motion and linkages. Applying knowledge to build a Cam-toy • Calculate moment of a force on a lever. • Explain how a lever works. • Name and describe the four types of motion. • Name and describe the motion of cams. • Describe the motion of a given linkage.	**Metals -Pewter Moulding** Knowledge of Metals, workshop H&S, simple design work, metal work skills • Keep myself safe in the workshop. • Name and describe the properties of different metals. • Name and explain the purpose of a range of tools. • Communicate my ideas with drawings and labels. • Safely manufacture a product. • Complete an evaluation of my product.	**Food & Nutrition – Lunchtime foods** Functions of ingredients, health and safety - personal hygiene, ingredient identification, sensory evaluation • Keep myself safe in the food room. • Explain how to feed myself healthy foods (based on the eatwell guide and 8 tips). • Used my senses to plan and evaluate different foods. • Identify ways to reduce food waste. • State the function of some ingredients. • Prepare a range of snacks.	**Textiles – Crafty critters** Skills and Design 6Rs, skills, target market analysis, synthetic fibres, product analysis, peer reviewing. • Recall and explain how the 6Rs influence design. • Outline how synthetic fibres are made and give examples. • Carry out a product analysis of an existing product. • Clearly communicate design ideas. • Apply my practical skills to make a puppet. • Honestly reflect on my own outcomes.	**ICT - E-safety & Computing ICT basics** Email, passwords, PP, word. E-Safety. Computing - graphical programming. • Send an email on the school system. • Use powerpoint to produce a presentation. • Use word to construct a document. • Identify ways to keep me safe online. • Use Kodu to make a computer game.