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| Subject: Design and Technology | Year: 10 | Developed by: Design and Technology | Date: September 2021 |
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INTENT

The themes for the year / areas of the curriculum to be studied / the big picture TO BE SHARED WITH STUDENTS (evidence in their books)

The Design and Technology Department offers two different Courses of study during KS4

AQA: Design and Technology GCSE

This year is the first year of GCSE studies. Knowledge from KS3 is revisited and developed in depth, to promote a greater understanding and the ability to apply this knowledge to real situations. Skills learned in KS3 are refined in preparation for the NEA section of the GCSE.

GCSE Design and Technology will prepare students to participate confidently and successfully in an increasingly technological world. Students will gain awareness and learn from wider influences on Design and Technology including historical, social, cultural, environmental and economic factors. Students will get the opportunity to work creatively when designing and making and apply technical and practical expertise.

GCSE D&T allows students to study core technical and designing and making principles, including a broad range of design processes, materials techniques and equipment. They will also have the opportunity to study specialist technical principles in greater depth.

Initially, students will study a variety of topics, as outlined in the AQA GCSE Specification, these will be delivered using a variety of methods including theoretical and practical methods, Their knowledge and understanding will be regularly assessed and the topics they study will be regularly revisited to embed the knowledge.

Towards the end of year 10, students will commence the NEA section of the course (this will be completed in yr 11)

Edexcel: Construction and the Built Environment BTEC

(Construction Technology, Exploring Carpentry and Joinery)

This is the introduction to the BTEC course, students are able to incorporate the skills and knowledge from KS3 to develop an understanding of the Construction Industry and its contribution to and impact upon the natural environment

This course allows students to study construction and the built environment, giving them the opportunity to gain a broad knowledge and understanding of the industry. They will develop skills such as interpreting and analysing information, identifying the infrastructure required for safe and efficient work, and understanding how client needs can shape building design.

Students complete three compulsory units, (over the two years of the course) covering the fundamental knowledge, skills and understanding required for construction technology and design:

construction technology (year 10)

scientific and mathematical application for construction (year 11)

construction and design. (year 11)

Additionally, they will complete a practical unit

exploring carpentry and joinery principles and techniques (year 10)

This qualification will enable students to develop a theoretical and practical knowledge of the built environment alongside some practical skills. It will also enable them to engage with the mathematical and scientific principles that underpin the construction industry, and to explore the impact of design through research and the application of their own ideas in response to a design brief.

This qualification will allow progress to further vocational study at level 3, such as a BTEC National in Construction and the Built Environment, or Engineering, or academic study such as A levels. The broad content may help successful learners enter a range of apprenticeships, for example in craft trades or built environment design.

GCSE IMPLEMENTATION

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|---|--|---|--|---|--|--|
| Overview of Year – Topic area and Assessment | <p>THEORY</p> <p>Sources and origins of materials</p> <p>Stock forms, types and sizes</p> <p>Specialist techniques and processes</p> <p>The use of production aids</p> <p>Tools, equipment and processes</p> <p>How materials are cut shaped and formed to a tolerance</p> <p>Commercial processes</p> <p>The application and use of Quality Control to include measurable and quantitative systems used during manufacture</p> <p>Material management</p> <p>Cut materials efficiently and minimise waste</p> <p>Use appropriate marking out methods, data points and coordinates</p> | <p>THEORY</p> <p>Tolerances</p> <p>Surface treatments and finishes</p> <p>Selection of materials or components</p> <p>Forces and stresses</p> <p>Materials and objects can be manipulated to resist and work with forces and stresses</p> <p>Materials can be enhanced to resist and work with forces and stresses to improve functionality</p> <p>Selection of materials and components</p> <p>Using and working with materials</p> <p>Properties of materials</p> <p>The modification of properties for specific purposes</p> <p>How to shape and form using cutting, abrasion and addition</p> | <p>THEORY</p> <p>Systems approach to designing</p> <p>Mechanical devices</p> <p>Different types of movement</p> <p>Changing magnitude and direction of force</p> <p>Developments in new materials</p> <p>Modern materials</p> <p>Smart materials</p> <p>Composite materials</p> <p>Technical textiles</p> <p>Materials and their working properties</p> <p>Material categories</p> <p>Papers and boards</p> <p>Natural and manufactured timbers</p> <p>Metals and alloys</p> <p>Polymers</p> <p>Textiles</p> | <p>THEORY</p> <p>New and emerging technologies</p> <p>Communication of design ideas</p> <p>Energy generation and storage</p> <p>Energy generation and storage</p> <p>Ecological and social footprint</p> <p>Communication of ideas</p> <p>Investigation, primary and secondary data</p> <p>The work of others</p> <p>Scales of production</p> <p>Design strategies</p> <p>Communication of design ideas</p> <p>Investigation, primary and secondary data</p> <p>Environmental, social and economic challenge</p> <p>Prototype development</p> <p>Specialist techniques and processes</p> <p>Material management</p> <p>Industry</p> <p>Enterprise</p> | <p>THEORY</p> <p>Sustainability</p> <p>People</p> <p>Culture</p> <p>Society</p> <p>Environment</p> <p>Production techniques and systems</p> <p>How the critical</p> <p>Energy generation and storage</p> <p>Fossil fuels</p> <p>Nuclear power</p> <p>Renewable energy</p> <p>Energy storage systems</p> <p>Ecological and social footprint</p> <p>Ecological issues in the design and manufacture of products</p> <p>The six Rs</p> <p>Social issues in the design and manufacture of products</p> | <p>NEA</p> <p>Section A: Identifying & investigating design possibilities</p> <p>Section B: Producing a design brief & specification</p> <p>Section C: Generating design ideas</p> |

BTEC IMPLEMENTATION

| | Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
|---|---|---|---|--|--|---|
| Overview of Year – Topic area and Assessment | <p>Unit 5: Exploring Carpentry and Joinery Principles and Techniques</p> <p>Learning aim A: Understand tools, materials and equipment used in carpentry and joinery</p> | <p>Unit 5: Exploring Carpentry and Joinery Principles and Techniques</p> <p>Completion of U5 LA: A</p> <p>Introduction to U5 LA : B</p> | <p>Unit 5: Exploring carpentry and joinery principles and techniques</p> <p>Learning aim B: Develop practical skills using safe techniques to produce a timber frame.</p> | <p>Unit 1: Construction Technology</p> <p>Learning aim A: Understand the structural performance required for low-rise construction</p> | <p>Unit 1: Construction Technology</p> <p>Learning aim B: Explore how sub-structures are constructed</p> | <p>Unit 1: Construction Technology</p> <p>Learning aim C: Explore how superstructures are constructed</p> |