Holy Cross Curriculum
Design Technology

Holy Cross Catholic High School

Product Design

Ambitious and Challenging
Broad and Balanced
Equality and Opportunity

Key Stage 2

When designing and making, pupils should be taught to:

Design
- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make
- select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate
- investigate and analyse a range of existing products
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world

Technical knowledge
- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- apply their understanding of computing to program, monitor and control their products.

Year 7

Term 1 / Term 2 / Term 3

Rotation one (8 weeks)

DESIGN, MAKE & EVALUATE MOODLAMP
- Iterative design process
- Design brief (given to them)
- Product analysis (writing frame used in a question and answer format)
- Electronic components (symbols and their uses)
- Resistors (Calculating values)
- Circuit diagrams
- Writing a specification
- Sketching (crating and ovals techniques)
- Presentation drawings and annotating. (leading questions to help with annotating)
- Modelling, development and modifications.
- CAD (2D Design) basics
- Record of manufacture
- Evaluating (writing frame used in a question and answer format)

BASIC MANUFACTURING SKILLS
CAD, laser cutting, soldering and circuit manufacture. Sawing, filing, sanding, finishing, drilling and countersinking.

Cultural Exposure:
- Sustainability
- The environment
- Social, moral and cultural issues

Year 8

Rotation one (8 weeks)

DESIGN, MAKE & EVALUATE USB
- Investigation (Design brief and product analysis) Prompts for design brief and ACCESSFM criteria for PA)
- Initial ideas (sketching 2D and 3D, rendering and annotation)
- Further development and research
- Modelling, prototyping and third party feedback
- Working drawing (to scale)
- Packaging (Product analysis of existing commercial packaging and GCSE style questions)
- Photoshop
- Record of manufacture
- Evaluating. (A pupil led activity with minimal teacher intervention. Some leading questions used to prompt answers.)

MORE ADVANCED MANUFACTURING SKILLS
CAD, laser cutting, filing, sanding and polishing
Mould manufacture: sawing, sanding, filing and vacuum forming

Cultural Exposure:
- Recycling
- Commercial viability of products
- Create visit (3D printing)

Year 9

Rotation one (8 weeks)

DESIGN, MAKE & EVALUATE SPEAKER
- Investigation (Design brief based on GCSE style expectations and product analysis)
- Manufacturing specification and restrictions. (Another key feature of GCSE NEA)
- Initial ideas (sketching 2D and 3D iso and perspective, rendering and annotation)
- Working drawing (to scale) Orthographic projection.
- Electric components. (Recall from Y7 along with some more complex learning)
- CAD (2D Design)
- Record of manufacture
- Evaluating. (Using the GCSE technique of evaluating against the specification that was written earlier in the project)

ADVANCED MANUFACTURING SKILLS
CAD, laser cutting, filing, sanding, QC and QA
Circuit manufacture. (Soldering)

Cultural Exposure:
- Industrial manufacture

Year 10

DESIGN, MAKE & EVALUATE PARTY PACK
Design and make a range of items for a child's party pack using the iterative design process. (PA, specification, brief, initial ideas, CAD, CAM, vacuum forming, mould manufacture, RoM, evaluation)

Theory: Core Unit One New and emerging technology: industry and enterprise, informing design decisions, people culture and society, production techniques and systems, sustainability and the environment.

DESIGN, MAKE & EVALUATE (Mock NEA)
Design and make a product using the iterative design process. (PA, specification, brief, customer profile, initial ideas, idea development, CAD, CAM, electronics, manufacturing, RoM, evaluation)

Theory: Core Unit Two composite materials, electronic systems, energy generation, energy storage, mechanical devices, modern materials, smart materials, a systems approach to design.

DESIGN, MAKE & EVALUATE AND FINAL NEA
Completion of Mock NEA. Introduction to NEA (Three contexts are given by the exam board, AQA, each June.) Pupils are to analyse each context and decide which they are going to focus on.

Theory: Core Unit Three metals and alloys, paper and boards, polymers, textiles and timbers.
Core Unit Four eco and social footprint, forces and stresses, improving functionality, scales and production, 6Rs.

Cultural Exposure:
- Industrial manufacturing
- Social, moral and cultural issues
- MBND Missile Systems
- Create Education 3D printing
- Cadbury World
- Jaguar Landrover Visit

Year 11

DESIGN, MAKE & EVALUATE FINAL NEA (50% of final grade)
Design and make a product using the iterative design process. (PA, specification, brief, customer profile, initial ideas, idea development, CAD, CAM, manufacturing, RoM, evaluation)

DESIGN, MAKE & EVALUATE NEA (50% of final grade)
Design and make a product using the iterative design process. (PA, specification, brief, customer profile, initial ideas, idea development, CAD, CAM, manufacturing, RoM, evaluation)
Completion by February half term.

Revision: Specialist materials, design and make principles.

REVISION (50% of final grade)
- Core technical principles.
- Specialist technical principles
- Design and make principles

Cultural Exposure:
- Real life clients development of appropriate products to suit their needs
- Real life clients development of appropriate products to suit their needs. Weekly jobs of the week. Live careers display with college and apprenticeship opportunities.