DESIGN & TECHNOLOGY

BE BOLD, BE BRAVE, BE BRILLIANT

KS4 Design & Technology Curriculum at a glance

Project Work

Designing

Define & Ideate Stage

Empathy Stage

Analyse & Evaluating

Non -Exam Assessment

Year 11

- Although this is the final stage of the design cycle, encourage students to evaluate throughout and act on their feedback (and consider the feedback of others too). It is not a final thing, but a step to improve further.
- Integrity tests can be useful to discuss, even if their prototype isn't able to be fully tested in this way. Some elements such as no finger traps can be tested with a probe (a small item the size of a finger, to see if/where it can fit, and potentially be a trap hazard).
- Getting students to realise when and why to make a prototype is key. What are they looking to prove / disprove? Linking the prototype method with the problem is a good Task.
- Prototypes may be card mechanisms, CAD models, fabric prototypes or an electronic Breadboard.
- The implement stage is when a prototype is put into production.
  - This is an opportunity to reinforce that a prototype outcome is only one stage in the creation of a product.
  - What processes are required to convert that prototype into a commercially available product?
- What manufacturing processes used to create the prototype would need to be re-evaluated for a larger scale of production?

Year 10 Term 4

Big Question: Set Theme by Teacher (Mock NEA)

- .This is where students try to get the real root of the problem and decide what they are going to do.
- • There may be a whole range of problems identified. Coming up with 'Concept strategies' is a good method to get students to think divergently (although at the end of this stage they need to be clear what they are looking to do).
- A range of techniques such as 2D, 3D, Exploded and cross sections are good.
- Consider exploring AI. Programs are being developed all the time and text to image programs can help students focus their key words and the overall aesthetic they are aiming for.
- CAD programs may be appropriate, again depending on the route taken. Many have easy-to-use simulation elements that can tell you the mass if you input the material.
- This can provide a useful task to get students to try and reduce weight by making walls thinner (for example) on a plastic product. There is also the opportunity to do renders adding in material details and even decals to act as company logos in the later 'Implement' stage.

Year 10 Term 3

- {upils to select theme based on three Big Questions provided by teacher.
- Pupils will be able to identify and work through the following design process to identify and explore their chosen target market and/or client.
- Pupils will undertake substantial research including, but not limited to mind maps, surveys, collaborative moodboards to better understand the scope of their theme.
- Pupils may explore similar products and services that link to their chosen theme. This can include disassembly and manufacturing explorations of existing products.
- Through rigorous product analysis, pupils will draw on prior learning to identify materials and processed they may use during the 'Ideate' phase of their design project.
- Client interviews and identification of their target market should take place and form part of substantial data collection and analysis.

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Year 10 Term 2

- .This is where students try to get the real root of the problem and decide what they are going to do.
- • There may be a whole range of problems identified. Coming up with 'Concept strategies' is a good method to get students to think divergently (although at the end of this stage they need to be clear what they are looking to do). Aside from the example of violence in A&E in the slides, areas such as 'knife crime' can also draw out a whole range of different ways to tackle the problem – with no right or wrong answer (especially as we haven't managed to solve this yet)
- A range of techniques such as 2D, 3D, Exploded and cross sections are good.
- Consider exploring AI. Programs are being developed all the time and text to image programs can help students focus their key words and the overall aesthetic they are aiming for.
- CAD programs may be appropriate, again depending on the route taken. Many have easy-to-use simulation elements that can tell you the mass if you input the material.
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Year 10 Term 1

Big Question: Making Life Easier for New Parents?

- Students should be introduced to this term if not already familiar.
- • Access to parents of young children is useful if possible. Whilst this can be problematic, possible interviews with parents or getting them to film routines / activities may be useful. They could speak to their own, but non-family is often more useful to drive home the authenticity of the task.
- • At the start of the context, students should be thinking wide with their thoughts, exploring the problem and not deciding too soon what they 'want to make', but observing what is happening and identifying problems.
- • Trying various aspects as a group can also be useful – putting up and down a variety of pushchairs, assembling a highchair, product evaluations on nightlights, changing bags and more can give pain points and problems to tackle.

In collaboration with:

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KS4 Design & Technology Curriculum at a glance

Theory

Specialist Technical Principles

Core Technical Principles

Designing & Making Principles

NEA and Examination Revision

- investigation, primary and secondary data: market research, interviews and human factors including ergonomics focus groups and product analysis and evaluation the use of anthropometric data and percentiles
- environmental, social and economic challenge: deforestation possible increase in carbon dioxide levels leading to potential global warming the need for fair trade.
- the work of others
- design strategies: collaboration, user centered design, a systems approach, iterative design, avoiding design fixation.
- communication of design ideas: freehand sketching, isometric and perspective, 2D and 3D drawings, system and schematic diagrams annotated drawing.
- prototype development
- selection of materials and components
- tolerances
- material management
- specialist tools and equipment
- specialist techniques and processes

Year 10 Term 4

Polymer Forming

Cement Casting

- new and emerging technologies: the design and organisation of the workplace including automation and the use of robotics, buildings and the place of work. Tools and equipment.
- energy generation and storage: How power is generated from: coal, gas and oil.
- developments in new materials: Developments made through the invention of new or improved processes eg Graphene, Metal foams and Titanium. Alterations to perform a particular function eg Coated metals, Liquid Crystal Displays (LCDs) and Nanomaterials
- systems approach to designing: Inputs, Processes and Outputs.
- mechanical devices: Levers, linkages and Pulleys. Cams and Gears
- materials and their working properties: Physical and working properties all all material categories including composite and smart/modern materials.

Year 10 Term 3

Foam Modelling

- selection of materials or components
- forces and stresses: Tension, compression, bending, torsion and shear.
- ecological and social footprint: Deforestation, mining, drilling and farming. Mileage of product from raw material source, manufacture, distribution, user location and final disposal. That carbon is produced during the manufacture of products. Reduce, refuse, re-use, repair, recycle and rethink.
- sources and origins
- using and working with materials: Papers and boards (flyers/leaflets and card based food packaging).
- Timber based materials (traditional timber children's toys and flat pack furniture).
- Metal based materials (cooking utensils and hand tools).
- Polymers (polymer seating and electrical fittings).
- Textile based materials (sportswear and furnishings).
- Electronic and mechanical systems (motor vehicles and domestic appliances).
- stock forms, types and sizes in all material categories.
- scales of production: One off, batch and mass production examples.
- specialist techniques and processes: Wastage, addition and forming/deforming processes.
- surface treatments and finishes.

Conductive Textiles

Year 10 Term 2

Soldering

Wood Joints & Finishes

- papers and boards
- timber based materials
- metal based materials
- polymers
- textile based materials
- electronic and mechanical systems

Year 10 Term 1