

YEAR 7 DESIGN AND TECHNOLOGY—RESISTANT MATERIALS PATHWAY

As part of DT carousel - Approximately one term

Add photos of examples of good work./cooking pages

Health and Safety

General safety in DT workshop, preventing accidents, Safe use of equipment. Understanding **of hazards**. Safe use of specific tools and equipment, (hand tools, sanding machine, scroll saw, pcb drill, pillar drill. Soldering.

Designing

Production of **two very different** creative designs using the same theme. Development of their design to be BIG and BOLD, creative, interesting, Clearly show the theme.

Specialist Technical Knowledge

Wood materials, softwood, hardwood and manufactured boards.

Electronic components, Battery, slide switch, buzzer, transistor, capacitor, resistor.

Planning and Making Skills (Realisation)

Production of basic softwood box using butt joints. Use of steel rule, try-square, tenon saw, sanding machine, chisel and mallet. Coping saw, scroll saw, files.

Production of decoupage design for top of box.

Production of electronic circuit using standard soldering and tinning methods.

Production of wire shape and loop using a bending jig.

Analysis and Evaluation

Evaluation of design ideas suggesting specific improvements.

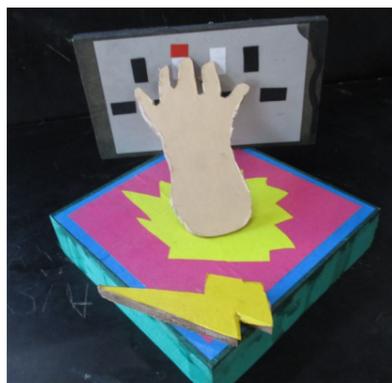
Peer and self assessment of designs suggesting improvements

Final evaluation of completed game, Practical work, designing - suggesting improvements.

Environment/Sustainability/Ethical Impact

Sustainability of wood materials

Electronics and Modern Life ILT— Social and environmental impact



YEAR 8 DESIGN AND TECHNOLOGY—RESISTANT MATERIALS PATHWAY

As part of DT carousel — approximately one term

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Health and Safety

Re-cap on General safety in DT workshop, understanding of the general risks and hazards and preventing accidents. Demonstration of safe use of metal working equipment, hand tools, drilling and use of the brazing hearth. Safe working with plastics, drilling, strip heater and gluing.

Designing

Development of a garden ornament made from acrylic pieces on a steel frame which includes movement.

Iterative design— Production of 3 very different Creative designs on a chosen theme and then a developed design. Use of modelling to test and develop the concept before producing a dimensioned final design. Designs and models are evaluated and developed at each stage.

Specialist Technical Knowledge

Metals—Ferrous and non ferrous metals,

Polymers—Different types and their uses.

Use of 2D design to produce a cutting layout for their product.

Planning and Making Skills (Realisation)

Production of metal frame from two pieces of mild steel flat bar. Use of basic marking out and cutting tools, drilling metal, use of brazing hearth to join components.

Production of laser cut acrylic pieces following students own 2D design cutting layout.

Drilling, bending (Using strip heater) and gluing of plastic parts.

Assembly of Garden Ornament using nut and bolts

Analysis and Evaluation

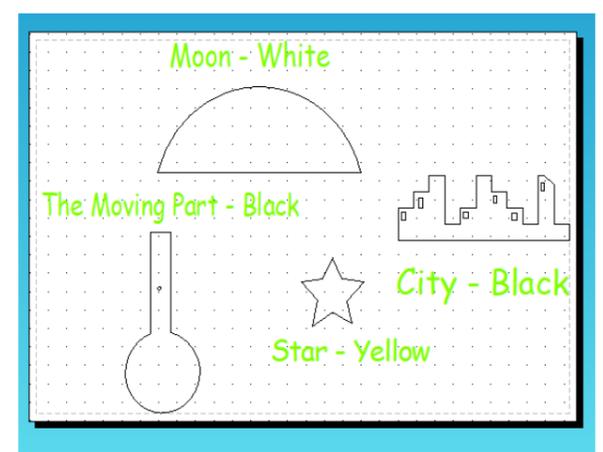
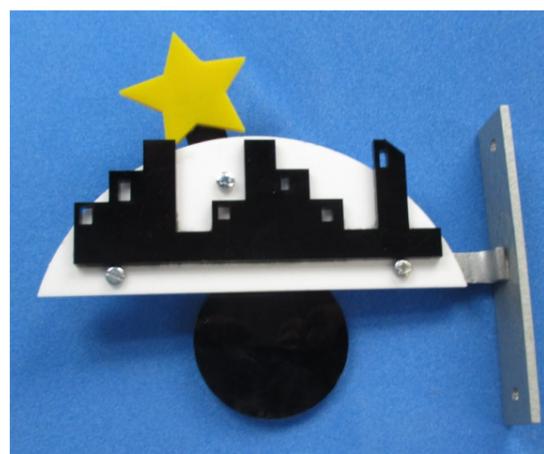
Evaluation of design ideas and models, suggesting specific improvements.

Peer and self assessment of designs against the design brief, suggesting specific improvements

Written final evaluation of completed Garden Ornament - Practical work and designing - suggesting specific improvements.

Environment/Sustainability/Ethical Impact

Sustainability of the production and use of metal and plastic products ILT



YEAR 9 transition DESIGN AND TECHNOLOGY—RESISTANT MATERIALS FOCUS

Health and Safety

Re-cap on General safety in DT workshop, understanding of the general risks and hazards and preventing accidents. Demonstrating safety in the classroom for practical tasks e.g. tools and equipment—general hand tools, Drilling machine, sander, electric hand drill, use of varnish.

Designing

Gaming Storage unit—Research into the requirements of the brief and production of design specification. Production of a range of 3D design drawings. Use of modelling to test and develop the concept before producing a dimensioned final design with a specific commercial style.

Specialist Technical Knowledge

Wood joints box— Understanding the key stages of timber production. The difference between soft woods, hard woods, their uses and properties. Types and properties of manufactured boards and their uses. Properties and uses of different wood joints.

Electronic product— Introduction to systems (inputs/process/output) components. Introduction to programming microcontrollers and the use of system flowcharts.

Planning and Making Skills (Realisation)

Wood joints box— Marking out and manufacture of a box using a finger, lap, dowel and mitre joint. Finishing box through sanding and varnishing. Use of dowel jig and power hand drill.

Gaming Storage unit— Production of 3D paper and card models. Use of 2D Design programme to produce a cutting layout for a flat pack 3D storage unit to be cut on the laser cutter.

Electronic product— Use of soldering equipment to produce a circuit using a microcontroller chip. Production of a programming flow chart to control their circuit.

Analysis and Evaluation

Wood joints box — Final evaluation of quality of wood joints and finishing and suggesting improvement that could be made with practical work.

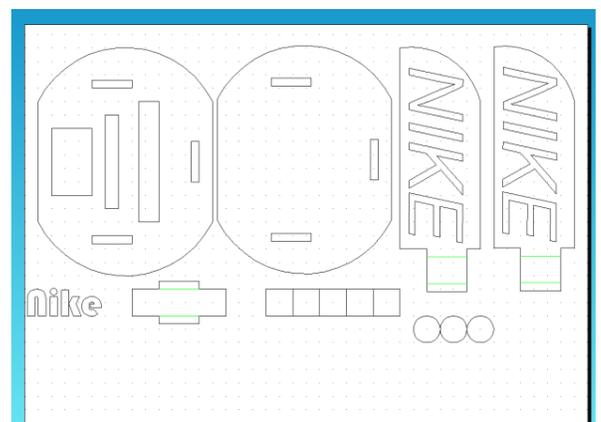
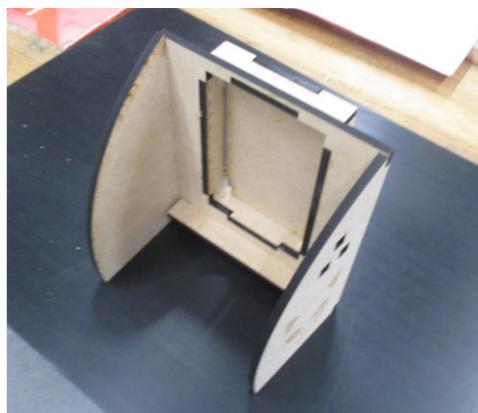
Gaming Storage unit — Evaluation of research, designs and models, against the design brief and specification and implementation of improvements. Final evaluation of design work and made product.

Electronic product — Final evaluation of soldering and product housing.

Environment/Sustainability/Ethical Impact

Wood joints box —Understanding of the environmental and sustainability of wood materials.

Gaming Storage — Considering the needs of the user.



YEAR 10 GCSE DESIGN AND TECHNOLOGY—RESISTANT MATERIALS

FOCUS

Add photos of examples of good work./cooking pages

Health and Safety

Re-cap on **General safety** in DT workshop, understanding of the general risks and hazards and preventing accidents. **Demonstrating safety** in the classroom for practical tasks particularly the lathe, brazing hearth, strip heater use of adhesives and finishes.

Designing

Designer Clock — Understanding the design styles of Philippe Starck (Post Modernism) and Charles Rennie Mackintosh (Art Nouveau) and using one of these styles to develop a creative design for an acrylic clock. Production of creative design drawings, models and a dimensioned final design.

Supporting garden wildlife project (practice NEA)— Research into garden wildlife, existing products and target user used to develop a brief and specification for their chosen product. Production of creative designs and modelling to develop a final design.

Drawing types— isometric, orthographic, 2 point perspective. Further use of 2D design and sketch-up 3D design

Specialist Technical Knowledge

Production of polymers, more detailed understanding of the different types of polymers and their uses, material properties, composites, modern materials

Production of ferrous metals and aluminium, types and properties of ferrous and non-ferrous metals, casting, welding and brazing, stock forms, finishing metals.

Core textiles, technical textiles.

Yr 10 mock examination

Planning and Making Skills (Realisation)

Production of a 2D design layout plan for the designer clock.

Marking out, drilling, hand finishing and bending acrylic.

Shaping metal with hand tools, bossing mallet, drilling, facing off and parallel turning, tapping threads, casting, brazing and finishing.

Production of a manufacturing specification for supporting wild life product, Use of a range of materials, tools and processes of their choosing to manufacture their design, production of a cutting list.

Analysis and Evaluation

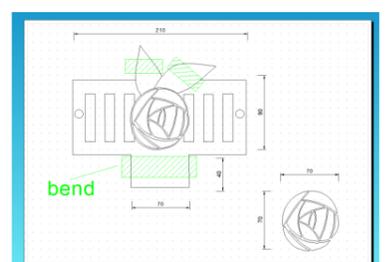
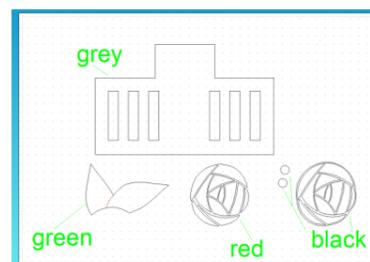
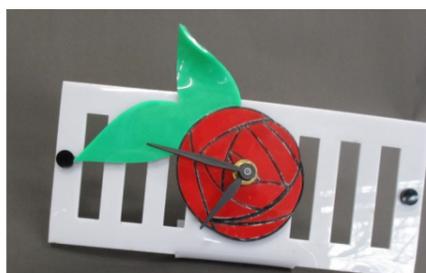
Analysis if different designers design styles, evaluation of design ideas and modelling including peer assessment. Final analysis of practical work with suggested modifications

Analysis research material for supporting garden wildlife project leading to development of brief and specification, evaluation of design ideas and modelling including peer assessment. Final analysis of practical work with suggested modifications.

Environment/Sustainability/Ethical Impact

Environmental impact/sustainability of metals and polymers, their production, use and disposal.

Consideration of economic/social/moral impact in the supporting garden wildlife project.



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Health and Safety

Recap on General safety in DT rooms— preventing accidents, defining safety. Identifying risks, suggesting improvements.
Demonstrating safety in the classroom for general and specific practical tasks as required for individual students practical work.
Understanding and correct use of PPE

Designing

Use of research into chosen challenge and production and development of creative design ideas and models in NEA folder
Apply knowledge and understanding - to real-world contexts and novel situations.

Specialist Technical Knowledge

Recall knowledge and show understanding - recall and communicate the fundamental elements of knowledge and understanding within Resistant Materials focus
Study and revision of theory aspects of the specification
Mock examination.

Planning and Making Skills (Realisation)

Production of a manufacturing specification for their NEA design.
Production of a high quality prototype for their NEA design
Evidence within sketchbook work and final outcome/s produced.

Analysis and Evaluation

On-going analysis of research, design work and modelling for their NEA design work including third party evaluation and feedback.
Final evaluation of NEA product with suggested improvements.

Environment/Sustainability/Ethical Impact

Consideration of economic/social/moral impact in their NEA project work. Consideration of their users needs and wants. Choice of materials for their sustainability.
Answering Environment/Sustainability/Ethical Impact question in both preparation for and taking mock and real exams.

