Subject: Design & Technology

KS3

Year 7	Year 8	Year 9
Project: World Clock	**Project: Mood Light**	**Project: Container Living**
Design Focus: To design and manufacture an analogue clock that Carlton Bolling can use in each classroom to inspire students to explore the world in which they live. It must be inspired by a specific country: its architecture, food, and culture. The clock will be made from types of timbers.	**Design Focus:** To design and manufacture a mood light which is aimed at teenagers to encourage them to have relaxation and quiet time by offering ambient mood lighting in their room. It must be inspired by Aljoud Lootah, who is passionate about patterns, geometric shapes and traditional UAE architecture.	**Design Focus:** Bradford has seen a rise in the number of refugees needing temporary housing. You will create a solution to support the council to temporarily house refugees when they arrive in the city using disused containers.
Materials: Timbers (plywood), Clock Mechanism, Paint.	**Materials:** Timbers (plywood), Polymers (Acrylic), Colour changing LED kit.	**Materials:** N/A
Tools: **CAD/CAM** - 2D Design, Laser cutter.	**Tools:** **CAD/CAM** - 2D Design, Laser cutter.	**Tools:** **CAD** - SketchUp
Workshop tools - scroll saw, pillar drill, tenon saw, coping saw, belt sander, glasspaper.	**Workshop tools** - Tenon saw, belt sander, glasspaper, PVA glue, soldering iron.	**Workshop tools** - Pencil, ruler.
Knowledge:	**Knowledge:**	**Knowledge:**
Theory Based:	**Theory Based:**	**Theory/Practical Based:**
Health & Safety - Students will learn how to keep themselves safe in the workshop, identify safety hazards, describe safe working habits and the benefits.	**Health & Safety -** Students will recall health and safety procedures to keep themselves safe in the workshop. They will learn what a risk assessment is, the potential hazards whilst soldering and how to control different variables when carrying out a practical.	**Contextual Challenge, Design Brief & Design Specification -** Students will learn how to deconstruct a contextual challenge to support them in creating their own design brief. They will create a design specification using ACCESS FM whilst extracting information from the brief. They will create a success criteria to explain how they will test the points made.
Design Brief & Design Specification - Students will learn about the design process to enable them to create a product to answer a design brief and to create a design specification which will set the guidelines to produce a high quality product.	**Design Brief & Design Specification** - Students will learn how to deconstruct a contextual challenge to support them in creating their own design brief. They will create a design specification using ACCESS FM whilst extracting information from the brief.	**Client/User Profile -** Students will be able to read an extract about specific clients and create a summary of their needs and wants.
Initial Design Ideas - Students will articulate their initial ideas through mind mapping. This will allow them to carry out research to produce a moodboard - A collection of images which will inspire them to create their design ideas.	**Client Profile -** Students will be able to explain who a client is and how to create a customer/client profile with the relevant information needed.	**Research (Product Analysis)** - Students will understand the different methods of research and different ways to achieve this (primary and secondary). They will focus on the importance of product analysis when creating a new product and how ACCESS FM is used as a tool to support this.
Assessment & Evaluation - Students will learn to carry out the iterative design process to develop		**Drawing Techniques -** Students will recall 3D drawing techniques such as Isometric & Oblique. They will be introduced to freehand sketching, One point perspective and two point perspective.

their designs through peer assessment and self-evaluation.

CAD/CAM - Students will gain an understanding of CAD and CAM, whilst identifying specific examples for each.

Workshop Tools - Students will be able to recall tools such as: bench vice, tenon saw, coping saw, scroll saw, pillar drill, cordless drill and glasspaper. They will be able to understand the function for each of these tools and how they will be utilised within their project.

Practical Based:

CAD CAM - They will apply their knowledge learnt to use CAD (2D Design) to design elements of their clock and CAM (Laser Cutter) to cut and engrave their design which will be inspired by a country of their choice.

Workshop Tools - Additional elements such as the backboard of their clock will be manufactured in the workshop using materials such as manufactured timber (plywood), the different workshop tools and applying a finishing technique such as paint.

Designer Research - Students will learn about a famous female Emirati designer called Aljoud Lootah and how they can take inspiration from her design style.

Initial Design Ideas - Students will learn 3D drawing techniques such as Isometric & Oblique, this will support them to create a 3D visual of their final product. 2D drawings will be created for the light panel which will take inspiration from the designer Aljoud Lootah. They will create various designs which will be developed further to form their final design.

CAD/CAM - Students will gain an understanding of CAD and CAM, whilst identifying specific examples for each. They will be able to identify the advantages and disadvantages of CAD & CAM in the real life world.

Electronics - Students will be able to identify the 3 main blocks to an electronic system (input, process and output) whilst identifying the functionality of each. They will be able to identify different electronic component names, symbols and their purpose within a circuit.

Polymers - Students will be able to identify the 2 categories of polymers (thermoset and thermoplastics). They will be able to identify specific examples and properties of these.

Soldering - Students will understand what this manufacturing process is, how it is used in the wider world and how to correctly solder. They will be able to draw a diagram of the process, identify the tools within soldering and their function.

Surface Treatments (Timbers) - Students will be able to define what a finish is, Identify different methods/techniques that are available. They will explain why it is important to apply a surface finish and its benefit to the material.

Assessment & Evaluation - Students will analyse their design ideas to assess if it meets the

Initial Design Ideas - Students will create different variations of design ideas for their living container. They will apply the drawing techniques to support them in creating 3D sketches. They will communicate their thought process by annotating their drawings with additional information. Students will learn about the iterative design process and how it helps to develop designs further. They will go through designing, prototyping and evaluation to complete the cycle.

Rendering - Students will gain an understanding of why designers render their drawings, how materials/textures can be shown through visualisation. They will consider factors such as lighting and how it has an effect on hitting an object from a specific angle.

CAD - Students will gain an understanding of the CAD program SketchUp and the functions of different tools. They will be using different tools such as: Push/Pull, Offset, Tape measure, Scaling and rendering. They will be able to develop their skills in 3D modelling to create different products before creating the final architectural model.

Floor Plans - Students will understand why floorplans are used in the architecture world, the possible variations within designs of different rooms in a living container. They will apply this knowledge to outline the different features within different rooms (E.g. kitchen units, storage, bathrooms, bedrooms, windows and doors).

Evaluation - Students will test their final design and 3D modelling against their Design specification. They will evaluate their outcome to come up with different modifications that could improve their design further. To finish off they will write up a self evaluation which will summarise how they got on during the project, which skills they were able to develop and how they could improve further.

| | requirements of the design specification. They will carry out self evaluation to assess the level of success within the project.

Practical Based:

CAD CAM - They will apply their knowledge learnt to use CAD (2D Design) to design the light panel and CAM (Laser Cutter) to cut and engrave their design which will be inspired by Aljoud Lootah.

Workshop Tools - The base box will be manufactured in the workshop using materials such as manufactured timber (Medium Density Fibreboard), the different workshop tools and applying a surface finish such as emulsion paint.

Soldering - Students will be able to use the soldering tools to create a complete LED printed circuit board which will be powered by a USB cable. | |
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KS4

Year 10	Year 11

Examination Board:
EDUQAS

Useful Resources and Revision Support