

Year 9 – CNC Clock Project

Lesson	Lesson content/Activity	Differentiation	Resources	Homework
1 hand tools (1.073) knives/ scissors (1.011) sandpaper (1.073) woodworking dust (1.071)	Safety Introduction Basic expectation for working in a design and technology environment. Including managing personal possessions. Identifying dangerous and prohibited machines and areas and emphasising the importance of moving about safely. Starter Introduction to the project and reading through the design brief. Complete a mind map to investigate possible themes. Main #1 Generating designs using provided media. Students observe patterns taken from different cultures and draw extracts of these patterns. Main #2 Discuss the needs wants and requirements for different users. Write a description for the user chosen for the clock. Emphasis on the link between this activity and the GCSE NEA and exams.	Modelling of outcomes using examples of previous students work. Clear photos of good work arranged to demonstrate increasing levels of quality.	Pictures of machines can be shown and they can be pointed out in the classroom. Exemplar work available for students to see and handle to discuss quality etc.	Mood board research task.

2 hand tools (1.073) knives/ scissors (1.011) sandpaper (1.073) woodworking dust (1.071) PVA (1.009) (1.009) Acrylic paint (4.012) Oil (1.070) Wax (1.070) Universal glue (1.007) 2 part epoxy resin type glue. Laser Cutter - MRAT - 1.032 Hegner saw (1.085) Line bender (1.061) Heating of plastic (1.055)	Starter Match the glue to the types of material. Demonstration Demonstrate the application of different glues in use. Discuss PVA, Tensol cement, 2-part epoxy and hot melt glue gun. Paying special attention to safety and ventilation requirements when handling Tensol cement. Main Pupils complete the glues information table then commence the FPT to use the available glue safely and with accuracy. Plenary Bring attention to successful examples of work produced in the lesson. Clear up Tables to be swept and washed as appropriate to avoid residue for following lessons.	Pre-cut materials and components to be supplied for all. Some more confident students will be allowed to enhance and personalise the artefact. A high level of supervision for use of glues and eye protection to be worn for highly fluid formulations.	Pre-cut materials Glues as available ideally. PVA Tensol cement 2-part epoxy Pritt stick. Contact adhesive	Adhesives knowledge.
3 hand tools (1.073) knives/ scissors (1.011) sandpaper (1.073) woodworking dust	Starter #1 Begin the lesson by answering the register by offering the name of a glue we have used or seen in the previous lesson.	Examples of good quality completed work provided to handle and investigate. Personal advice and instruction		

(1.071) pva (1.009)	Demo How to complete the FPT from previous lesson as required. This can include finishing techniques and how to wash / organise dye and paint. Main Completion and finishing of the FPT. Starter #2 Explain what a design specification is. How is this relevant to a clock? Relate to the previous lesson i.e. defining the user. Main#2 Write the design specification using the modelled example as a guide to the amount of writing desired.	offered. Modelled answers provided and can be printed in large font as required. Vocabulary is defined in the teaching materials.		
4 hand tools (1.073) knives/ scissors (1.011) sandpaper (1.073) woodworking dust (1.071) pva (1.009)	Demo Having written the design spec and target user the pupils are shown good quality design sketches and sketching techniques. Emphasis on the use of the CNC machine for part of the project. Revise experience from year 8 and inform as required. Main Complete a range of design ideas on paper.	Modelling of outcomes using examples of previous students work. Clear photos of good work arranged to demonstrate increasing levels of quality.	Existing pre-made examples.	

	Plenary Complete the selection question to show reasoning and understanding of why a particular design meets the needs of the client and additionally why it is a good quality design.			
5 hand tools (1.073) knives/ scissors (1.011) sandpaper (1.073) woodworking dust (1.071) pva (1.009)	Starter Register by naming a modelling material (materials shown on the board). Demo How to safely use knives, cutting mats and appropriate modelling tools such as coping saws etc. Main Complete full scale corrugated card models of their chosen designs.		Card and modelling materials. Cutting mats and knives. PVA and hot melt glue as appropriate to the class.	
6	Starter Recap the use of 2D design. Demonstrate drawing basic shapes and use of simple drawing tools encountered before. Demo How to draw a basic clock face including the use of the circular array tool and the rotate tool to draw in the numbers.		Computers with 2D design and mice. Design work. Demonstration videos. Net-support software.	

	Main Draw a basic clock using the tools available. Extension Demonstrate the laying out of the clock pieces onto a sheet for cutting including important measurements.			
7	Starter Recap the use of 2D design. Demonstrate drawing basic shapes and use of simple drawing tools encountered before. Demo How to draw a developed clock including the advanced tools. Laying out the clock so that it can be efficiently cut out. Main Draw a final clock design using 2D design. Extension Using Sketchup to complete a 3D model of a clock. Use of sketchup teaching videos.		Computers with 2D design and mice. Design work. Demonstration videos. Net-support software.	
8 Painting (4.012) sandpaper (1.073)	Starter Laser cutter and CNC videos to demonstrate	Components are pre- cut for lower grades and assembly is	Exemplar work showing a range of	Complete a production plan

woodworking dust (1.071) pva (1.009) hand tools (1.073)	the production of their clocks. Main Painting, decoration and assembly of their clocks. Using hand tools and using existing skills. Extension Addition of 3D elements and extra components and processes.	demonstrated. Simpler designs v's complex designs according to the pupils' engagement and skill.	inspirational methods of construction and finishing. Clock mechanisms Glue Paint Sandpaper Coping Saw Blades Aprons	to show understanding of the making process.
9 Painting (4.012) sandpaper (1.073) woodworking dust (1.071) pva (1.009) hand tools (1.073))	Starter Re-cap CNC v's hand tools advantages and disadvantages. Main Painting, decoration and assembly of their clocks. Using hand tools and using existing skills. Extension Addition of 3D elements and extra components and processes.	Components are pre- cut for lower grades and assembly is demonstrated. Simpler designs v's complex designs according to the pupils' engagement and skill.	Exemplar work showing a range of inspirational methods of construction and finishing. Clock mechanisms Glue Paint Sandpaper Coping Saw Blades Aprons	Complete a production plan to show understanding of the making process.
10	Starter Compare the final outcomes. Write positive feedback for ones another to include in	Pre prepared photos of students work.	Examples of peer assessment and positive feedback.	

	folders. Main Use pre-prepared photos to help evaluate their project against the original specification and design brief. Extension Re- design and development of the clock that has been produced to include improvements and changes.	Worksheet available with additional key words and prompts to aid completion of the task.		
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