Subject: Computer Aided Design and Manufacture (CAD / CAM) Year group: 9 (Industrial Technology)

Core Content Overview:

This project is designed to give you some experience of GCSE Design and Technology (Systems) and builds upon learning in Years 7 & 8. This unit covers working with a client and following the design process to manufacture a prototype lamp. In manufacturing the lamp an electronic circuit is produced and an aesthetically designed package is manufactured using computers to design and cut out using laser cutter.

The Design Brief

Mood lamps are lighting devices that are used to establish a particular feeling or mood within a room. In some cases, this type of lamp may be a small device that is plugged into an outlet and creates points of light near the floor line of the room. Other examples of a mood lamp may be used to illuminate specific points along the walls or cast a soft light over a larger piece of furniture in the room.

You have been approached by a company who manufacture lamps to design and manufacture a prototype mood lamp to compliment a client's room.

Essential parameters, The device

- Should be in keeping with the style of existing furniture.
- Circuit and power supply should not be visible.
- Should be manufactured from one A4 sheet of material.
- The final packaged prototype should reflect the design theme of the client.
- Packaging should be produced using CNC (Computer Numerical Control) equipment

Key Skills:

Learning outcomes include the following

- Following the Design Process.
- Working from a Design Brief.
- Carrying out independent research.
- Sketching ideas using a variety of techniques, isometric, orthographic and any other chosen by the student.
- Completing a design exercise emulating the requirements of the GCSE coursework students will encounter in Year 11. The final portfolio will be marked with reference to the GCSE marking scheme.
- Manufacture of a prototype component, working to a timescale.

GRADE	DESCRIPTOR
Yr 9 Grade 7	• Fully developed range of specification points that are realistic, technical and measurable, based on a fully relevant investigation of research in relation to the challenge. • Fully sound justification of the performance requirements for the product in relation to the challenge. • Fully sound consideration for the user needs and specification parameters. • Ideas demonstrate a fully sound understanding of relevant materials, processes and techniques. • Fully developed analysis of design ideas leading to effective refinement and development of designs, which considers comprehensive factors and makes fully relevant connections between elements of the design. • Effective evaluation of design ideas leading to considered refinement and development of designs, demonstrating a fully sound understanding of design considerations. • Effective evaluation of the refinements made to the chosen design, supported by fully sound reference to feedback made by others and the consideration of the materials, components and manufacturing techniques. • Effective selection of materials that are fully appropriate for the chosen prototype. • Show a fully sound understanding of material properties of the materials used in the prototype. • Produce a fully functioning prototype that fully meets the end user needs in relation to a demanding design problem. • Produce a prototype that fully meets the design specification. Show a fully sound understanding of the need for accuracy.

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GRADE	DESCRIPTOR
Yr 9 Grade 4	• Mostly developed range of specification points that are realistic and mostly measurable, based on a mostly relevant investigation of research in relation to the challenge. • Generally sound justification of the performance requirements for the product in relation to the challenge. • Generally sound consideration for the user needs and specification parameters. • Ideas demonstrate a generally sound understanding of relevant materials, processes and techniques. • Generally developed analysis of design ideas, leading to appropriate refinement and development of designs, which considers appropriate factors and makes mostly relevant connections between elements of the design. • Competent evaluation of design ideas leading to appropriate refinement and development of designs, demonstrating a mostly sound understanding of design considerations. • Competent evaluation of the refinements made to the chosen design, with mostly sound reference to feedback made by others, and the consideration of the materials, components and manufacturing techniques. • Considered selection of materials that are mostly appropriate for the chosen prototype. • Show a generally sound understanding of material properties of the materials used in the prototype. • Produce a mostly functioning prototype that mostly meets the end user needs in relation to a generally demanding design problem. • Produce a prototype that mostly meets the design specification. • Show a generally sound understanding of the need for accuracy.

GRADE	DESCRIPTOR
Yr 9 Grade 1	• Limited range of specification points that are basic and partially measurable, based on a superficial investigation of research in relation to the challenge. • Basic justification of the performance requirements for the product in relation to the challenge. • Limited consideration for the user needs and specification parameters. • Ideas demonstrate a basic understanding of some materials and processes. • Superficial analysis of design ideas in response to the challenge, which considers basic factors and makes limited connections between elements of the design. • Basic evaluation of design ideas leading to a limited refinement and development of designs, demonstrating a limited understanding of design considerations. • Basic evaluation of the refinements made to the chosen design, with limited reference to feedback made by others, and the consideration of the materials and components. • Basic selection of materials that are generally appropriate for the chosen prototype. • Show limited understanding of the material properties of the materials used in the prototype. • Produce a generally functioning prototype that adequately meets the end user needs in relation to a partially demanding design problem. • Produce a prototype that meets some aspects of the design specification. • Show a partially sound understanding of the need for accuracy. •