

St Benedict's Catholic High School: Design Technology & Engineering

Topic Area: **Product Design & Electronics**

Activity: **Torch**

Time Allocation: **13 hours (inc. hours for manufacture)**



The main aims of the unit

The main aim of this unit is for students to develop understanding of the design process with the main focus being on their ability to design and develop a wide range of ideas throughout the project and their ability to produce a high quality finished product. Students are also introduced to a range of both graphical and presentation techniques and a wider range of tools and equipment within the workshop.

In this unit, students tackle a design and make assignment (DMA) on the theme of an LED pocket torch. They use Acrylic to produce their product and are introduced to some basic electronics and learn how to assemble the components correctly. The unit is very much a design based task.

Values of the unit

Pupils gain the knowledge, skills and understanding they need to carry out the DMA successfully through product evaluation activities and focused practical tasks. They will:

- Learn how to recognise an LED.
- Learn how to use a design brief when designing a new product.
- Learn how to use a web-diagram.
- They will examine the properties of thermoplastics and thermosetting plastics.
- They will design a variety of outcomes that would answer the design brief and examine how effective they are.
- They will be expected to work to a tight specification throughout.
- Learn about a range of graphical and presentation techniques.
- Learn how to evaluate work at all stages of a project to ensure a successful finished outcome.
- Develop practical skills such as model making, planning and using templates.
- Learn how to use a wide range of tools and equipment safely and successfully.

The nature of the project

All of the students will:

- Design and make the shape for the body of the torch.
- Learn about suitable materials and design processes.
- Attempt to make modifications.
- Become familiar with a variety of production methods.
- Use a specifications list and design restrictions effectively.
- Produce a mock-up / model of their design to aid manufacture.

Cross-curricular links

- ICT – Internet research.
- Science - Knowledge of plastics and other suitable materials.
- Electronics – Understanding of basic electronics and components.

There are opportunities for pupils to:

- Learn that designers evaluate and modify their prototypes before starting a production run.
- Learn that designers must consider the product in use and use their anthropometric and ergonomic data to ensure a successful outcome.

Activities	Outcomes
<p>Set the pupils a DMA in which they:</p> <p>Use a range of manufacturing techniques such as hand drawn, hand-tools to cut, shape and form materials safely, modelling making.</p> <p>Setting the scene – Torch</p> <p><i>As winter approaches the nights will begin to draw close.</i></p>	<p>Identify the particular requirements of the task and the design criteria to be met.</p> <p>Draw upon their understanding of familiar products.</p> <p>Discuss design ideas with other students.</p> <p>Evaluate their products against the criteria and suggest design improvements.</p> <p>Test, modify and make adjustments in order to improve performance.</p>

Health and Safety

Health and safety - during the making process, pupils should learn to recognise hazards, assess risks and take steps to control the risks to themselves and others. Pupils will also learn department rules for health and safety including wearing aprons for practical working and removing blazers and ties, wearing goggles when operating machinery etc.