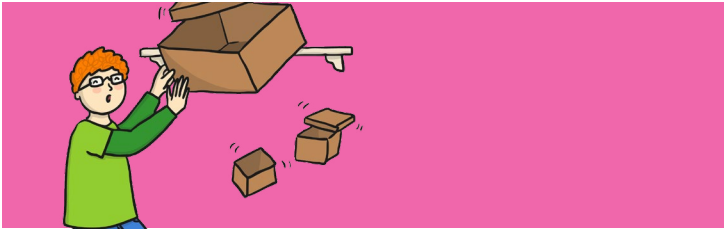


# Battery Operated Lights

Design and Technology | LKS2 | Unit Overview

## Introduction

This 'Battery Operated Lights' unit gives children opportunities to enhance their knowledge and understanding of electrical systems. In this unit children will develop understanding about series and parallel circuits and different types switches. They will then be given the chance to apply their knowledge about electric circuits in a purposeful way by designing and making a battery operated light which will be controlled by a homemade switch. Children will decide upon the design criteria for the light by considering who will use it, where it will be used and what for. Finally, children will complete a detailed evaluation of their final product.



## Health & Safety

When carrying out a risk assessment for this activity, teachers will need to consider the materials, tools and equipment being used.

In addition, the following points should be noted:

- explain to children that they should not experiment with mains electricity.
- rechargeable batteries shouldn't be used for home-made circuits – in the event of a short circuit they could get very hot and may cause injury.
- care should be taken when using wire strippers and cutters as they have sharp edges.



## Home Learning

**Lighting Lookout:** Children are challenged to use their eyes to lookout for different types of lighting around them. They should try to find examples of lights that are controlled using a remote control or a control switch. They are asked to record their findings in a table.

**Making a Lava Lamp:** Children follow detailed instructions which show them how to make an amazing home-made lava lamp! They then learn about the science behind what they see happening.



## Wider Learning

A visit to a local museum which shows examples of houses throughout different periods of time would allow children to experience hands on how lighting has changed throughout history.

## Assessment Statements

By the end of this unit...

### ...all children should be able to:

- Explain how technology has helped shaped the world we live in.
- Explore and make a series and parallel circuit and follow instructions to make a switch.
- Draw a simple annotated design.
- Write their own simple design criteria.
- Make a product which contains a working circuit to light a bulb.
- Use a series of given questions to evaluate their product.

### ...most children will be able to:

- Name some key events and individuals that have helped shape the world of lighting.
- Explore and make a series and parallel circuit, diagnosing faults when necessary, and follow instructions to make a selection of different switches.
- Draw a design which uses annotations to add some detail.
- Develop design criteria to inform the design of innovative products considering the purpose and target group/individual.
- Make a well finished product considering the aesthetic and functional qualities.
- Use design criteria to help develop their own questions and use the answers to help guide the evaluation process.

### ...some children will be able to:

- Use the creative ideas of others to help inspire their own innovative design ideas.
- Design and make their own switch.
- Draw a cross sectional diagram to show the working electrical components of a product.
- Carefully select materials and finishing techniques to ensure a high quality finish.
- Base design criteria around the needs of the design brief and prioritise the specifications.
- Evaluate their product in detail against the design criteria.

To look at all the resources in the Battery Operated Lights unit [click here](#).

# Lesson Breakdown

## 1. Our Changing Technologies

Understand how key events and individuals in design and technology have helped shape the world in the context of looking at technological developments in the way we light our homes.

- I can explain how key events and individuals in design and technology have helped shape the world.

## 2. Electrical Systems

Understand and use electrical systems in their products (for example, series circuits, incorporating switches, and bulbs) in the context of understanding how a series and parallel circuit can be used to light a bulb.

- I can make and represent different types of circuits.

## 3. Switches

Understand and use electrical systems in their products (for example, incorporating switches) in the context of understanding how switches can be made and used in circuits.

- I can make and use switches.

## 4. Designing

Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups in the context of developing design criteria for a light.

- I can develop design criteria and a design.

Generate, develop, model and communicate their ideas through annotated sketches and cross sectional in the context of sketching a design for a light.

- I can develop and communicate a design for my light.

## 5. Making the Light

Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities in the context of choosing materials and components to make the main structure of the light.

- I can select materials and components to make my light.

## 6. Finishing and Evaluating

Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities in the context of selecting materials and components which will create a well finished light.

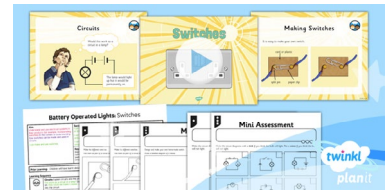
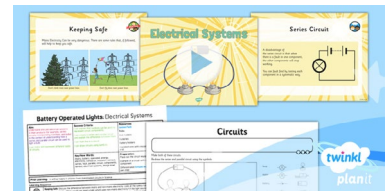
- I can create a well finished product.

Evaluate their ideas and products against design criteria and consider the views of others to improve their work in the context of evaluating a battery operated light.

- I can complete a detailed evaluation of my finished product.

## Resources

- None needed.



- Bulbs, bulb holders, batteries, battery holders, insulated wire with crocodile clips on the end.

- Foil, coins, wires, bulbs, split pins, paper clips, plastic, cardboard, scissors, pegs, ball bearings, bulbs, bulb holders, batteries, battery holders, wires.

- Examples of different types of lights.
- Children will need the resources they were asked to collect, at home, in lesson 2.

- Bulbs, bulb holders, a range of shapes and sizes of batteries and battery holders, paperclips, split pins a range of cardboard cylinders, a range of other small cardboard boxes, a range of small plastic bottles, stiff/corrugated card, plastic, sticky/masking tape, PVA glue, thin wooden strips, bubble wrap.
- Tools: scissors, rulers, pencils.

- Bulbs, bulb holders, thin insulated wire with and without crocodile clips at either end, short springs or stiff bare wire for making springs, foil, clear film, tracing paper, coloured paper, coloured stickers, string, straws, small buttons, pencils, felt tips.
- Tools: Wire cutters/strippers, small screwdrivers, scissors, rulers.

To find out more about PlanIt download our [free guide here](#).

To look at all the resources in the Battery Operated Lights unit [click here](#).