


## KS2: Structures- Lightboxes

### Key Vocabulary

<b>Strong</b>	A structure that can support itself and hold it's contents.
<b>Stable</b>	A structure that sits level to the ground
<b>Accurate</b>	Measurements that are the same as those in a design.
<b>Series circuit</b>	A closed circuit in which the current follows one path.
<b>Insulator</b>	A substance that does not conduct electricity
<b>LED</b>	A light-emitting diode
<b>Incandescent</b>	An electric light with a wire filament heated until it glows

### Research

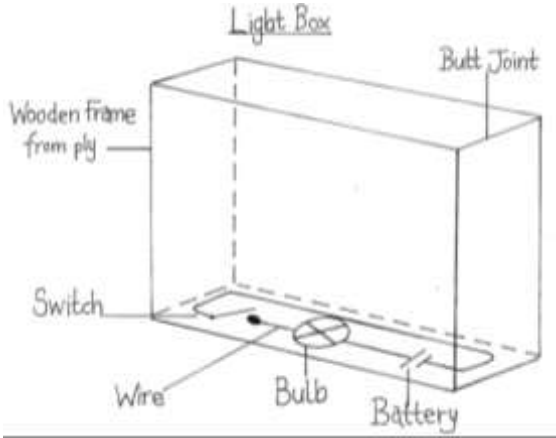

<b>Purpose</b>	Light boxes can either be used to display information or for decoration. 
<b>Light Bulbs</b>	There are two different types of bulb, incandescent and LED (Light Emitting Diode) bulbs. The disadvantages of incandescent light bulbs are they are dimmer and have a shorter lifespan than LED light bulbs
<b>Key Research Questions</b>	What are the <b>purposes</b> of such a range of light boxes? What makes an <b>effective design</b> for a light box? How do the light circuits work within light boxes? In what ways have the light boxes been designed so they are <b>safe</b> to use?

### The Project

<b>Introduction</b>	This project combines skills learnt in Key Stage 1 of joining wood together with learning of electricity in Key Stage 2. The project will include 3 areas of design, a circuit, a box and a silhouette that will be light up from the bulb.
<b>Purpose for Project</b>	For the light boxes to be used in an exhibition for the community of Gamlingay, to celebrate Christmas.



### Design

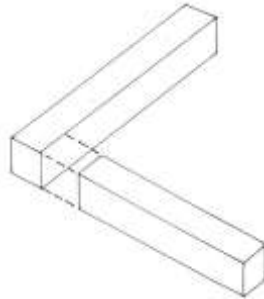
<b>Cross Sectional Design and Symbols</b>	<p>A cross-sectional design shows what is inside an object which you would not see from the outside. It can sometimes be imagined by cutting something in half.</p> <p>To draw a cross sectional design first begin by draw the 3D cuboid, the same as you did in KS1. For the parts that you wouldn't normally see draw dashed lines.</p> <p>Next, use the correct circuit symbols to illustrate where your circuit will be in relation to the rest of the lightbox. Label correctly.</p> 
<b>Silhouette</b>	<p>Silhouettes work best when they are simple,</p>  <p>Draw a few bold and clear designs, ready to be cut out of black card.</p>

## Make

### Building the frame

Use a butt joint to create the frame, using masking tape where necessary.

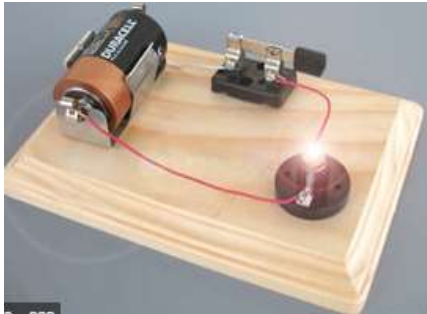
The material will be the thinner so take extra care in the joining process.



### Making a series circuit

Using the learning from science build a series circuit on the base, inside the light box.

Remember to join the circuit using masking tape, ensuring it is neat.



### Making the silhouette

Cut out a large piece of coloured tissue paper, larger than the frame of the light box

Next arrange and stick your silhouette (glue on the silhouette) onto the tissue paper

Use masking tape to join the silhouette and paper to the frame

## Evaluate

### You will learn how to

Think critically about your project against the design criteria

Ask a peer to give their reflection of the successes of your project, outlining one area to work on

Reflect on the problems you encountered and how you over came them

Suggest how you could extend this project further if you were to do it again.