# KS2: Structures- Lightboxes

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

| Research | |
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| ***Purpose*** | Light boxes can either be used to display information or for decoration.<br>  <br>  |
| ***Light Bulbs*** | 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 |
| ***Key Research Questions*** | What are the **purposes** of such a range of light boxes?<br>What makes an **effective design** for a light box?<br>How do the light circuits work within light boxes?<br>In what ways have the light boxes been designed so they are **safe** to use? |

| The Project | |
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| ***Introduction*** | 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. |
| ***Purpose for Project*** | For the light boxes to be used in an exhibition for the community of Gamlingay, to celebrate Christmas. |

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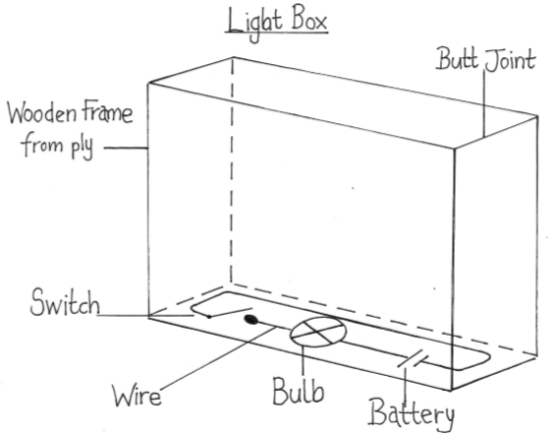
| **Cross Sectional Design and Symbols** | A cross-sectional design shows what is inside an object which you would not see from the outside. It can sometimes be imagined by cutting something in half.<br><br>To draw a cross sectional design first begin by draw the 3D cuboid, the same as you did in KS1.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

| Make | |
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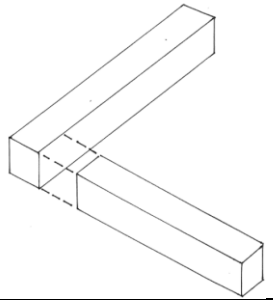
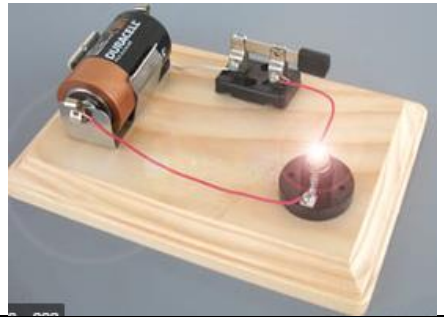
| **Building the frame** | Use a butt joint to create the frame, using masking tape where necessary.<br><br>The material will be the thinner so take extra care in the joining process.<br><br>  |
| **Making a series circuit** | Using the learning from science build a series circuit on the base, inside the light box.<br><br>Remember to join the circuit using masking tape, ensuring it is neat.<br><br>  |
| **Making the silhouette** | Cut out a large piece of coloured tisse paper, larger than the frame of the light box<br><br>Next arrange and stick your silhouette (glue on the silhouette) onto the tissue paper<br><br>Use masking tape to join the silhouette and paper to the frame |

| Evaluate | |
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| **You will learn how to** | Think critically about your project against the design criteria<br><br>Ask a peer to give their reflection of the successes of your project, outlining one area to work on<br><br>Reflect on the problems you encountered and how you over came them<br><br>Suggest how you could extend this project further if you were to do it again. |

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