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| **Willerby Carr Lane Primary School – Design and Technology** | | |
| **Topic:** | **Year: 4** | **Strand: Electrical Systems** |

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| **What should I already know?** |
| * Used construction materials e.g. wood, card, and appropriate adhesives. * Built simple series electric circuits and rectified faults that occur (Y4 Electricity science unit) * The dangers of electricity and how to use it safely. * Learnt how the components work and used simple tools required to connect these together |

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| **What will I know / be able to do by the end of the unit?** | |
| How are lights controlled? | * Lights are controlled by a switch. * Types of switches are: on/ off switch, push to make switch, push to break switch, timer switch, tilt switch, rocker switch, slide switch, micro switch, timer switch, sensor switch. |
| How do switches work and how are circuits with a variety of different switches made? | * See electrical diagrams below. * Create a variety of switches e.g. using paperclips, coins, foil and identify which would work in their light design |
| How do I create an light for a particular purpose? | * Draw on their understanding of simple electrical circuits and switches to help them generate ideas about their lamp. * Create a design for a family member which would be used for a particular purpose e.g. use in their bedroom/mobile (torch) * Use a variety of recycled materials e.g. plastic bottles to create a design * Join and decorate the materials of their device using a range of appropriate techniques. * Use a switch control their lamp – consider where the electrical components will be housed so that none of the electrics are visible |

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| **Vocabulary** | |
| buzzers | use electric current to create their own sound. used in alarm systems. |
| conductor | a material which allows heat or electricity to pass through it easily. |
| insulator | a material that does not conduct electricity and can therefore be used as a coating to components, circuit boards and wires. |
| light emitting diode (led) | they are available in different colours and levels of brightness. they have replaced the filament bulb in many everyday uses. |
| prototype | a first version of a device or vehicle from which other forms are developed. |
| push to break switches | this type of switch breaks the circuit when the button is pressed. in this case, the alarm would sound when an item was lifted off the switch e.g. in a museum. |
| push to make switches | simple input devices which allow electrical current to flow when pushed. |

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| **Key Design Decisions & Skills** |
| * how to generate ideas, considering the purposes for which they are designing * how to explore, develop and communicate aspects of their design by modelling their ideas in a variety of ways * how to consider reliability when developing proposals * how electrical circuits can be used to achieve functioning results * how to control their light using a switch * Where to put the switch to make the light viable * Produce a labelled drawing to communicate their ideas to others. * how to evaluate their products carrying out appropriate tests - Review design intentions and suggest ways of improving it. |

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| **Tools and Resources** |
| * press switch, slide switch, push-to-make switch, * lamp, lamp holder * LED (light emitting diode), batteries, battery holder, battery clip • wood, card, coloured paper, fabrics * adhesives |

**Design ideas**



**Symbols for switches in electrical diagrams**

  

 