



**Design technology— Year 4/5— Medium Term Plan**  
**Autumn 2, Unit 1: Electrical Systems: Torches**



<i>Lesson</i>	<i>Learning Objective</i>	<i>Success Criteria</i>	<i>National Curriculum Links</i>	<i>Vocabulary</i>	<i>Resources</i>
<i>One: Electrical Products</i>	<i>To learn about electrical items and how they work.</i>	<i>I can identify electrical products.  I know what electrical conductors and insulators are.  I know that a battery contains stored electricity and can be used to power products.</i>	<i>Evaluate</i>  <i>Investigate and analyse a range of existing products.</i>  <i>Technical knowledge</i>  <i>Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].</i>	<i>- battery - bulb - buzzer - conductor - circuit - circuit diagram - electricity - insulator - series - circuit - switch</i>	<i>- Electric circuit component sets: batteries, battery holders, wires, bulb, buzzer and motor (one set per table). - Card/cardboard rectangle (one per table). - Split pins (two per table). - Paper clips (one per table). - Link: <a href="#">Switched on Kids - Electrical safety in your home</a> – this is an external website and we do not have control over their content – please check before showing them to the children. - Link: <a href="#">Kapow Primary, Computing, Year 2 What is a computer?</a> - Link: <a href="#">Kapow Primary, Computing, Year 3, Journey inside a computer.</a> -</i>
<i>Two: Evaluating Torches</i>	<i>To analyse and evaluate electrical products.</i>	<i>- I can identify the features of a torch. - I understand how a torch works. - I can say what is good and bad about different torches. - I understand what is important in torch design.</i>	<i>Design</i>  <i>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.</i>  <i>Evaluate</i>  <i>Investigate and analyse a range of existing products.</i>	<i>- circuit - component - design - design criteria - diagram - evaluation - LED - model - series - circuit - shape - target - audience -</i>	<i>- Presentation: 3, 2, 1. - Presentation: Torches.</i>

			<p>Understand how key events and individuals in design and technology have helped the world.</p> <p><b>Technical knowledge</b></p> <p>Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].</p>		
Three: Torch Design	To design a product to fit a set of specific user needs.	<ul style="list-style-type: none"> <li>- I can factor in who my product is for in my design criteria.</li> <li>- I can design a torch which satisfies both the design and success criteria.</li> <li>-</li> </ul>	<p><b>Design</b></p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.</li> </ul> <p><b>Technical knowledge</b></p> <ul style="list-style-type: none"> <li>- Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].</li> </ul>	<ul style="list-style-type: none"> <li>- circuit</li> <li>- component</li> <li>- design</li> <li>- design criteria</li> <li>- diagram</li> <li>- input</li> <li>- insulator</li> <li>- recyclable</li> <li>- switch</li> <li>- theme</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Presentation: Gimme five!</li> <li>- Children's completed torch evaluations from <a href="#">Kapow Primary, Design &amp; technology, Year 4, Electrical systems, Lesson 2: Evaluating torches.</a></li> </ul>
Four: Torch Assembly	To make and evaluate a torch.	<ul style="list-style-type: none"> <li>- I can make a working circuit with a switch.</li> <li>- I can use appropriate equipment to cut and attach materials.</li> </ul>	<p><b>Make</b></p> <ul style="list-style-type: none"> <li>- Select from and use a wider range of tools and equipment to perform practical tasks.</li> </ul>	<ul style="list-style-type: none"> <li>- aesthetics</li> <li>- assemble</li> <li>- equipment</li> <li>- evaluation</li> <li>- ingredients</li> <li>- model</li> </ul>	<ul style="list-style-type: none"> <li>- Presentation: Range of answers.</li> <li>- Each pupil's torch design and user profile from <a href="#">Design &amp; Technology, Year 4, Electrical systems, Lesson 3: Torch design.</a></li> </ul>

		<ul style="list-style-type: none"> <li>- I can assemble a torch according to my design criteria.</li> <li>- I can assemble a torch which satisfies the success criteria.</li> <li>- I can test my torch to evaluate its success.</li> </ul>	<ul style="list-style-type: none"> <li>- 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.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</li> </ul> <p><b>Technical knowledge</b></p> <ul style="list-style-type: none"> <li>- Understand and use electrical systems in their products.</li> </ul>	<ul style="list-style-type: none"> <li>- <b>packaging properties</b></li> <li>- <b>shape</b></li> <li>- <b>sketch</b></li> <li>- <b>test</b></li> </ul>	<ul style="list-style-type: none"> <li>- Electric circuit sets – wires, bulbs, bulb holders, batteries and battery holders (one set per pupil).</li> <li>- Recycled materials to make the body of the torch (for example, plastic bottles, packaging, cardboard).</li> <li>- Reflective material (for example, foil).</li> <li>- Card/cardboard.</li> <li>- Scissors (one per pupil).</li> <li>- Split pins (two per pupil).</li> <li>- Paper clips (one per pupil).</li> <li>- Link: <a href="#">Kapow Primary, Design &amp; Technology, Year 4, Electrical systems, Lesson 1: Electrical products</a> (see Adaptive teaching for additional support if needed).</li> </ul>
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<p><b>Assessment:</b></p> <ul style="list-style-type: none"> <li>- What is electricity?</li> <li>- What type of diagram is this?</li> <li>- What do these symbols represent?</li> <li>- What is a conductor?</li> <li>- What is an insulator?</li> <li>- What type of circuit is this?</li> <li>- Series circuits only have...</li> <li>- Which answer is a portable form of electricity?</li> <li>- What does this symbol represent?</li> <li>- List electrical health and safety tips</li> </ul>	
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*Design technology—Year 4/5— Medium Term Plan  
Spring 2, Unit 2: Textiles: Fastenings*



Lesson	Learning Objective	Success Criteria	National Curriculum Links	Vocabulary	Resources
One: Evaluating fastenings	To explain the advantages and disadvantages of different types of fastening type.	<ul style="list-style-type: none"> <li>- I know what the main types of fastenings are.</li> <li>- I can say what the benefits of each fastening type are.</li> <li>- I can say what the disadvantages of each fastening type are.</li> </ul>	<p>Design and technology</p> <p>Evaluate</p> <p>Pupils should be taught to:</p> <p>Investigate and analyse a range of existing products.</p>	<ul style="list-style-type: none"> <li>- Criteria</li> <li>- Fabric</li> <li>- Fastening</li> <li>- Fix</li> <li>- Mock-up</li> <li>- Stitch</li> <li>- Template</li> </ul>	<ul style="list-style-type: none"> <li>- Physical examples of fastenings (optional).</li> <li>- Link: Assessment – D&amp;T Y4: Textiles: Fastenings (optional – see Attention grabber).</li> </ul>
Two: Designing my book sleeve	To design a product to meet design criteria.	<p>Success criteria</p> <p>I can design a product based on a design criteria.</p> <p>I can write a design criteria.</p> <p>My design includes a fastening.</p>	<p>Design</p> <p>Pupils should be taught to:</p> <p>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.</p> <p>Evaluate</p> <p>Pupils should be taught to:</p> <p>Evaluate their ideas and products against their own design criteria.</p>	<ul style="list-style-type: none"> <li>- Criteria</li> <li>- Fabric</li> <li>- Fastening</li> <li>- Fix</li> <li>- Mock-up</li> <li>- Stitch</li> <li>- Template</li> </ul>	<ul style="list-style-type: none"> <li>- Presentation: 3, 2, 1.</li> <li>- Presentation: Book sleeve examples.</li> <li>- A3 pieces of paper.</li> <li>- Children's books (ask pupils to use their own reading books).</li> <li>- A4 paper (two sheets per pupil).</li> <li>- Range of fastening for children to explore (the same range that they will be able to use).</li> </ul>
Three: Paper mock-up and preparing fabric.	To make and test a paper template	<p>I can make a paper template.</p> <p>I know how to test a paper template.</p>	<ul style="list-style-type: none"> <li>- Design</li> <li>- Pupils should be taught to:</li> <li>- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for</li> </ul>	<ul style="list-style-type: none"> <li>- Criteria</li> <li>- Fabric</li> <li>- Fastening</li> <li>- Fix</li> <li>- Mock-up</li> <li>- Stitch</li> <li>- Template</li> </ul>	<ul style="list-style-type: none"> <li>- Presentation: Gimme five!</li> <li>- Pupils' Activity: Design sheets from Lesson 2: Designing my book sleeve.</li> <li>- A3 paper.</li> <li>- Pins.</li> <li>- Fabric.</li> </ul>

			<p>purpose, aimed at particular individuals or groups.</p> <ul style="list-style-type: none"> <li>- Evaluate</li> <li>- Pupils should be taught to:</li> <li>- Evaluate their ideas and products against their own design criteria.</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Criteria</li> <li>- Fabric</li> <li>- Fastening</li> <li>- Fix</li> <li>- Mock-up</li> <li>- Stitch</li> <li>- Template</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Fastenings.</li> <li>- Scissors.</li> <li>-</li> </ul>
<p>Four: Assembling my book sleeve.</p>	<p>To assemble a book jacket.</p>	<ul style="list-style-type: none"> <li>• I can join fabric by sewing.</li> <li>• I can stick to my design criteria.</li> <li>• My product is fit for purpose.</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Make</b></li> <li>- Pupils should be taught to:</li> <li>- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.</li> <li>- 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.</li> <li>- <b>Evaluate</b></li> <li>- Pupils should be taught to:</li> <li>- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</li> </ul>	<ul style="list-style-type: none"> <li>- Criteria</li> <li>- Fabric</li> <li>- Fastening</li> <li>- Fix</li> <li>- Mock-up</li> <li>- Stitch</li> <li>- Template</li> </ul>	<p>Presentation: Agree or disagree.</p> <p>Thread.</p> <p>Needles.</p> <p>Thimbles (optional).</p> <p>Fabric glue.</p> <p>Decorative items.</p> <p>Fastenings (e.g. press studs, buttons, tie).</p> <p>Link: Assessment – D&amp;T Y4: Textiles: Fastenings (optional – see Wrapping up).</p>
<p>Assessment:</p>	<p>What do we mean by accurate? What do we mean by threading a needle? What is a fastening? Which picture shows a zipper? Which picture shows a toggle? Which picture shows a press stud? What is a fabric? What is the definition of a</p>				

	<i>prototype? What is the hole in a needle called? Why is it important to make a prototype first?</i>				
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*Design technology—Year 4/5— Medium Term Plan*  
*Summer 2, Unit 2: Mechanical Systems: Making a Slingshot Car*

Lesson	Learning Objective	Success Criteria	National Curriculum Links	Vocabulary	Resources
<p>One: Chassis and Launch Mechanism</p>	<p>To build a car chassis.</p>	<ul style="list-style-type: none"> <li>- I understand that car designs have developed over many years.</li> <li>- I know that a chassis is the frame of a car on which everything else is built.</li> <li>- I know that all moving things have kinetic energy.</li> <li>- I know that kinetic energy is the energy that something (an object or person) has by being in motion, e.g., the energy that a swing has to keep moving; any object in motion uses kinetic energy.</li> </ul>	<p><b>Make</b></p> <ul style="list-style-type: none"> <li>- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.</li> <li>- 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.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>- Investigate and analyse a range of existing products.</li> <li>- Understand how key events and individuals in design and technology have helped shape the world.</li> </ul> <p><b>Technical knowledge</b></p> <ul style="list-style-type: none"> <li>- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</li> <li>- Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].</li> </ul>	<ul style="list-style-type: none"> <li>- chassis</li> <li>- energy</li> <li>- kinetic</li> <li>- mechanism</li> </ul>	<ul style="list-style-type: none"> <li>- <i>Presentation: Slingshot cars.</i></li> <li>- Pre-made demonstration car.</li> <li>- 4mm wooden dowel or rod (30cm recommended).</li> <li>- Wheels (38-40mm recommended) with central holes, although some children may find the 50mm wheels less fiddly to assemble.</li> <li>- Drinking straws (two per pupil).</li> <li>- Paperclips (one per pupil).</li> <li>- Lollipop sticks (nine per pupil).</li> <li>- Elastic bands (one per pupil).</li> <li>- Masking tape.</li> <li>- Glue guns (one per available adult to supervise children's use) and/or PVA glue and spreaders.</li> </ul>

<p>Two: Designing the Car Body</p>	<p>To design a shape that reduces air resistance.</p>	<ul style="list-style-type: none"> <li>- I can design a suitable car body to cover my chassis by:</li> <li>- Drawing a net to create a structure from.</li> <li>- Choosing shapes that increase or decrease the speed of the car as a result of air resistance.</li> <li>- Adding graphics to personalise my design.</li> <li>-</li> </ul>	<p><b>Design</b></p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>- Investigate and analyse a range of existing products.</li> <li>- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</li> </ul>	<ul style="list-style-type: none"> <li>- air resistance</li> <li>- chassis</li> <li>- design graphics</li> <li>- model</li> <li>- research</li> <li>- structure</li> <li>- template</li> </ul>	<ul style="list-style-type: none"> <li>- <i>Presentation: Brain dump.</i></li> <li>- <i>Presentation: Designing the car chassis.</i></li> <li>- Children's toy cars brought in from home.</li> <li>- At least one pre-made demonstration car.</li> <li>- Drawing and colouring pencils (enough for each child to use).</li> <li>- Plastic cups/building blocks/card boxes/cushions for a crash target.</li> <li>- Link: <a href="#">Science Projects- How to demonstrate air resistance</a> on VideoLink or A4 paper to conduct the experiment in class.</li> </ul>
<p>Three: Making the Car Body</p>	<p>To make a model based on a chosen design.</p>	<ul style="list-style-type: none"> <li>- I can make the body of my car by:</li> <li>- Remembering that nets are flat shapes that can be turned into 3D structures.</li> <li>- Measuring, marking and cutting the panels (nets) against the dimensions of my chassis.</li> <li>- Including tabs on my net so I can secure them to the panels of my chassis</li> <li>- Decorating the panels.</li> <li>-</li> </ul>	<p><b>Design</b></p> <ul style="list-style-type: none"> <li>- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.</li> </ul> <p><b>Make</b></p> <ul style="list-style-type: none"> <li>- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.</li> </ul>	<ul style="list-style-type: none"> <li>- air resistance</li> <li>- chassis</li> <li>- design graphics</li> <li>- model</li> <li>- research</li> <li>- structure</li> <li>- template</li> </ul>	<ul style="list-style-type: none"> <li>- <i>Presentation: Agree or disagree.</i></li> <li>- Children's completed Activity: Car body design templates from <a href="#">'Lesson 2: Designing the car body'</a>.</li> <li>- Card (two A4 pages or one A3 page per child).</li> <li>- Drawing and colouring pencils (enough for each child).</li> <li>- Coloured card, for decoration/graphics.</li> <li>- Scissors (one pair per pupil).</li> <li>- A few pre-cut tab strips for children who have forgotten to add tabs to their nets or accidentally cut them off.</li> </ul>



			<ul style="list-style-type: none"> <li>- 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.</li> </ul> <p><b>Technical knowledge</b></p> <ul style="list-style-type: none"> <li>- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</li> </ul>		<ul style="list-style-type: none"> <li>- Glue gun if available or PVA glue.</li> <li>- Glue sticks.</li> </ul>
<p>Four: Assembly and Testing</p>	<p>To assemble and test my completed product.</p>	<ul style="list-style-type: none"> <li>- I can assemble the panels of the body to the chassis correctly.</li> <li>- I can remember that smaller shapes create less air resistance and can move faster through the air.</li> <li>- I can evaluate the speed of my design based on the understanding that some cars are faster than others as a result of the following: Body shape. Stored energy in the elastic band. Accuracy of the angle in the chassis and axle.</li> </ul>	<p><b>Make</b></p> <ul style="list-style-type: none"> <li>- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.</li> <li>- 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.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</li> </ul> <p><b>Technical knowledge</b></p> <ul style="list-style-type: none"> <li>- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</li> <li>- Understand and use mechanical systems in their products [for</li> </ul>	<ul style="list-style-type: none"> <li>- air resistance</li> <li>- chassis design</li> <li>- graphics model</li> <li>- research structure</li> <li>- template</li> </ul>	<p><i>Presentation: Quizmaster.</i></p> <ul style="list-style-type: none"> <li>- Children's chassis' and panels/nets from <a href="#">Lesson 3: Making the car body</a>.</li> <li>- Glue sticks (enough per table).</li> <li>- Glue guns or PVA glue.</li> <li>- A large clear space for testing.</li> <li>- A start and finish line.</li> <li>- Stopwatches.</li> </ul>

			<i>example, gears, pulleys, cams, levers and linkages].</i>		
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*Assessment:*

- *What is a mechanism?*
- *What is an exploded-diagram?*
- *What do we mean by aesthetics?*
- *What do we mean by graphics?*
- *Air resistance is...*
- *What is a template?*
- *Which view of the car can you see?*
- *Why is it important to test and evaluate a product?*