




Knowledge & Skills Progression – Mechanisms(KS1) Mechanical Systems (KS2)

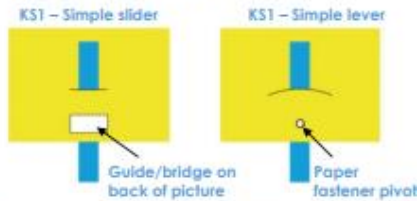
	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2		
Focus	Children learn about simple mechanisms through designing and making moving pictures and vehicles. They understand that different mechanisms produce different types of movement and explore and evaluate a range of products with wheels and axles	Children build on their knowledge of levers and linkages from KS1, distinguishing between fixed and loose pivots. They focus on cutting and shaping materials with precision in order for the mechanism to work.	Children learn about controlling movement with a CAM mechanism as part of a simple toy. They understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.		
Design	<p>Sliders and Levers Generate ideas based on simple design criteria and their own experience, explaining what they could make <i>e.g. use card strips and paper fasteners to make something appear and disappear</i></p> <p>Develop, model and communicate their ideas through drawings and mock-ups with card and paper <i>e.g. Using arrows to show movement on their drawing and labelling parts of the mechanism using key vocabulary.</i></p>	<p>Generate realistic ideas and their own design criteria through discussion, focussing on the needs of the user <i>e.g. storybook with moving parts, pop-up greetings cards</i></p> <p>Use annotated sketches and prototypes to develop, model and communicate ideas. <i>e.g. paper models of pop-up designs, card strips attached to corrugated card for linkage type mechanisms</i></p>	<p>Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources</p> <p>Develop a simple design specification to guide their thinking.</p> <p>Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.</p>		
	<p>Wheels and Axels Generate initial ideas and simple design criteria through talking and using own experiences <i>e.g. Farm vehicle with different sized wheels, elongated body for a bus</i></p> <p>Develop and communicate ideas through drawings and mock-ups. <i>e.g. Using arrows to show movement on their drawing and labelling parts of the mechanism using key vocabulary.</i></p>			Make	<p>Sliders and Levers Plan by suggesting what to do next.</p> <p>Select and use tools, explaining choices, to cut, shape and join paper and card. <i>e.g. stiffening through straws and pipe cleaners</i></p> <p>Use simple finishing techniques suitable to the product they are creating <i>e.g. collage, paint, cut out shapes to stick on, computer generated graphics or text</i></p>
Make	<p>Sliders and Levers Plan by suggesting what to do next.</p> <p>Select and use tools, explaining choices, to cut, shape and join paper and card. <i>e.g. stiffening through straws and pipe cleaners</i></p> <p>Use simple finishing techniques suitable to the product they are creating <i>e.g. collage, paint, cut out shapes to stick on, computer generated graphics or text</i></p>	<p>Order the main stages of making</p> <p>Select from and use appropriate tools with some accuracy to cut, shape and join paper and card <i>e.g. scissors, paper fasteners, paper clips, tape</i></p> <p>Select and use finishing techniques suitable for the product they are creating <i>e.g. neatenng the edges with a trim, incorporate art and design skills</i></p>	<p>Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. <i>e.g. ruler to measure, vice and hacksaw to cut a piece of dowel</i></p> <p>Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost</p>		
	<p>Wheels and Axels Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing <i>e.g. scissors, tape, hole puncher, straws, plastic tube</i></p>				

	<p>Join wheels and axels <i>e.g. wheel attached to axel (axel free to rotate), axel fixed with the wheel free to rotate around it</i></p> <p>Select from and use a range of materials and components according to their characteristics <i>e.g.. card for body of the vehicle , plastic for wheels, blu-tac/modelling clay to stop wheel falling off</i></p>		
Evaluate	<p>Sliders and Levers Explore a range of existing books and everyday products that use simple sliders and levers. <i>e.g Look at books and ask questions like 'What do you think will move?' 'How do you think the mechanism works?'</i></p> <p>Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.</p> <p>Wheels and Axels Explore and evaluate a range of products with wheels and axels <i>e.g explore toys and everyday objects answering questions like 'How do you think the wheels are fixed on?' 'How do you think the wheels move?'</i></p> <p>Evaluate their ideas throughout and their products against original criteria <i>e.g. What I like about it? Does it work? What would I change?</i></p>	<p>Investigate and analyse books and, where available, other products with lever and linkage mechanisms</p> <p>Evaluate their own products and ideas against criteria and user needs, as they design and make, <i>e.g. How could I improve it? What do I need to change?</i></p>	<p>Compare the final product to the original design specification</p> <p>Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose</p> <p>Consider the views of others to improve their work.</p> <p>Investigate famous manufacturing and engineering companies relevant to the project.</p> <p>Critically evaluate the product against their design specification, intended user and purpose</p> <p>Suggest improvements and points of modification <i>e.g. Does the product meet the design brief? What could be done differently next time?</i></p>
Key Vocabulary	<p>Slider, lever, pivot, slot, bridge/guide, pull, push, up, down, straight, curve, forwards, backwards</p> <p>vehicle, wheel, axle, axle holder, chassis, body, cab</p>	<p>Mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output linear, rotary, oscillating, reciprocating</p> 	<p>pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor</p> <p>circuit, switch, circuit diagram</p> <p>cam, snail cam, off-centre cam, peg cam, pear shaped cam follower, axle, shaft, crank, handle, housing, framework</p>
Technical Knowledge and Understanding	<p>Explore and use sliders and levers</p> <p>Understand that different mechanisms produce different types of movement</p> <p>Explore and evaluate a range of products with wheels and axles</p> <p>Distinguish between fixed and freely moving axles</p> <p>Know and use technical vocabulary relevant to their project.</p>	<p>Understand and use lever and linkage mechanisms</p> <p>Distinguish between fixed and loose pivots</p> <p>Know and use technical vocabulary relevant to their project.</p>	<p>Understand that mechanical and electrical systems have an input, process and an output</p> <p>Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.</p> <p>Understand how cams can be used to produce different types of movement and change the direction of movement</p>

Know and use technical vocabulary relevant to the project.

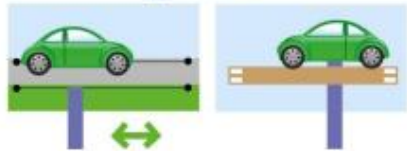
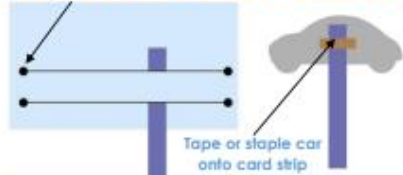
Picture progression

Teaching aids to demonstrate sliders and levers



Sliders move from side to side and up and down

Use a single hole punch to make a hole then cut a slot



Slicky fixers on back of card

A card strip could be used instead of cutting slots to allow movement

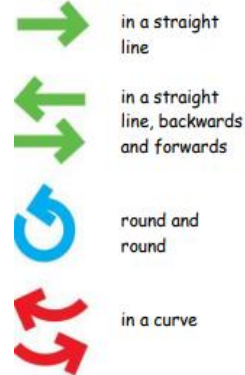


Levers can be used with or without a slot



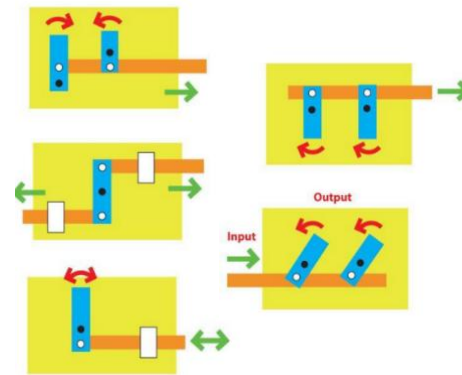
A card strip is used as a lever. The fish and boat are glued to the lever which is used as a handle.

Simple mechanisms move:



Teaching aids to demonstrate levers and linkages

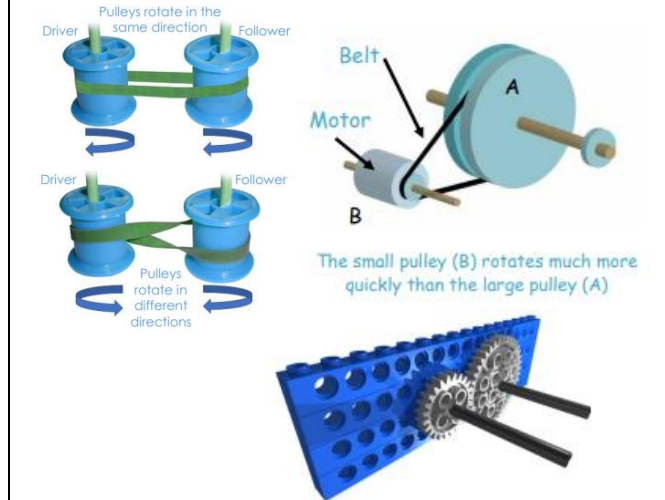
- Fixed pivot
- Loose pivot



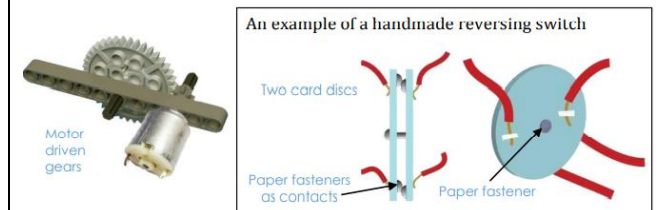
Lever and linkage mechanisms usually produce oscillating or reciprocating movement:



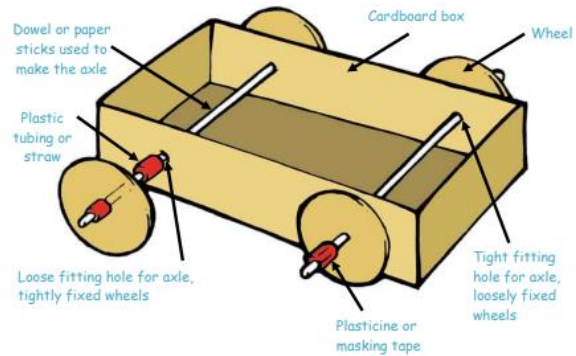
Developing understanding of gears and pulleys



Building gears or pulleys into children's products



Example of two different ways to fix wheels



Types of wheels



Ways to hold moving axles

pairs of clothes pegs



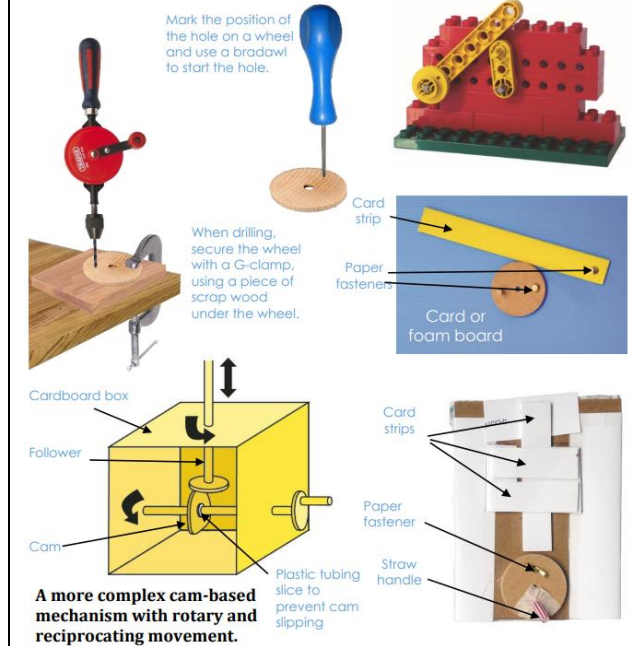
card triangles



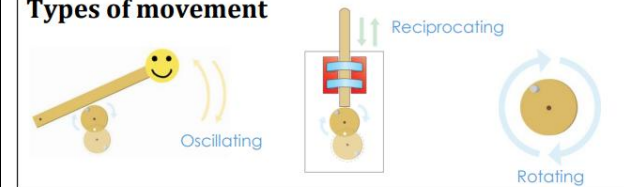
large paper/plastic straws



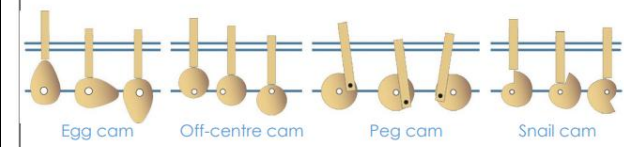
Making teaching aids to demonstrate cams



Types of movement



Types of cams



Example Ideas

- Storybook
- Greetings card
- Poster
- Emergency Service Vehicle
- Shopping trolley
- Vehicle for story character

- Storybook
- Moving poster
- Information book
- Greetings card

- Moving toy
- Moving boat
- Jack-in-the-box
- Turntable
- A vehicle incorporating cam driven components



Knowledge & Skills Progression– Textiles

	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Focus	Children learn how simple 3-D textile products are made, using a template to create two identical shapes which they will then join using different techniques. They gain knowledge about marking out, cutting and joining of pieces of fabric.	Children build on their knowledge of joining two pieces of fabric together, understanding the need for patterns and seam allowances. Children also learn how to strengthen, stiffen and reinforce existing fabrics.	Children gain knowledge about making their own paper template and cutting and joining of pieces of fabric using a range of stitches and finishing techniques. They will understand that a 3-D textile product is made from a combination of accurately made pattern pieces, fabric shapes and different fabrics.
Design	<p>Design a functional and appealing product for a chosen user and purpose based on simple design criteria. <i>e.g. small puppet linked to their English unit of work</i></p> <p>Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology.</p>	<p>Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s <i>e.g. money wallet, pencil case</i></p> <p>Produce annotated sketches, prototypes, final product sketches and pattern pieces. <i>e.g. prototype using paper/card</i></p>	<p>Generate innovative ideas by carrying out research including surveys, interviews and questionnaires.</p> <p>Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computer aided design.</p> <p>Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.</p>
Make	<p>Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing. <i>e.g. paperclip the paper pattern to the fabric, running stitch, gluing, over stitch</i></p> <p>Select from and use textiles according to their characteristics.</p>	<p>Plan the main stages of making <i>e.g. using a flowchart or storyboard with annotated sketches</i></p> <p>Select and use a range of appropriate tools with some accuracy <i>e.g. cutting, joining and finishing.</i></p> <p>Select fabrics and fastenings according to their functional characteristics <i>e.g. strength, and aesthetic qualities</i></p>	<p>Produce detailed lists of equipment and fabrics relevant to their tasks. <i>e.g. also explain fabric choices</i></p> <p>Formulate step-by-step plans and, if appropriate, allocate tasks within a team. <i>e.g. using a flowchart or storyboard with detailed annotation</i></p> <p>Select from, use a range of tools and equipment to make products that are accurately assembled and well finished. Work within constraints of time, resources and cost.</p>
Evaluate	<p>Explore and evaluate a range of existing textile products relevant to the project being undertaken. <i>e.g. fabrics, joining techniques, finishing techniques and fastenings used.</i></p> <p>Evaluate their ideas throughout and their final products against original design criteria <i>e.g. What I like about it. Does it look like the model? What would I change?</i></p>	<p>Investigate a range of 3-D textile products relevant to the project. <i>e.g. products with a selection of stitches, joins, fabrics, finishing techniques, fastenings</i></p> <p>Test their product against the original design criteria and with the intended user. Take into account others' views. <i>e.g. Does the container hold the placed item? Tested by intended user – what do they think?</i></p> <p>Understand how a key event/individual has influenced the development of the chosen product and/or fabric. <i>e.g. the invention of zips and Velcro.</i></p>	<p>Investigate and analyse textile products linked to their final product. <i>e.g. disassemble a product</i></p> <p>Compare the final product to the original design specification. <i>e.g. Does the product meet the design brief? How could they be made better?</i></p> <p>Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.</p> <p>Consider the views of others to improve their work</p>

Key Vocabulary	template, pattern pieces, mark out, join, decorate, finish starting, ending, running stitch, stapling, gluing	fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance	seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper
Technical Knowledge and Understanding	<p>Understand how simple 3-D textile products are made, using a template to create two identical shapes.</p> <p>Understand how to join fabrics using different techniques e.g. <i>running stitch, glue, over stitch, stapling</i>.</p> <p>Explore different finishing techniques e.g. <i>using painting, fabric crayons, stitching, sequins, buttons and ribbons</i>.</p> <p>Know and use technical vocabulary relevant to the project.</p>	<p>Know how to strengthen, stiffen and reinforce existing fabrics.</p> <p>Understand how to securely join two pieces of fabric together.</p> <p>Understand the need for patterns and seam allowances.</p> <p>Know and use technical vocabulary relevant to the project.</p>	<p>A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics.</p> <p>Fabrics can be strengthened, stiffened and reinforced where appropriate.</p>

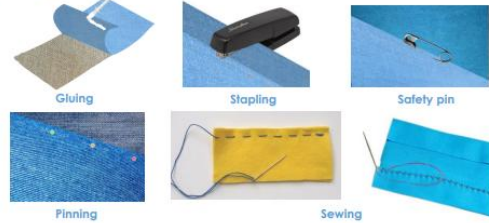
Picture progression

Three alternative ways of using templates and simple pattern pieces



Exploring and evaluating joining techniques

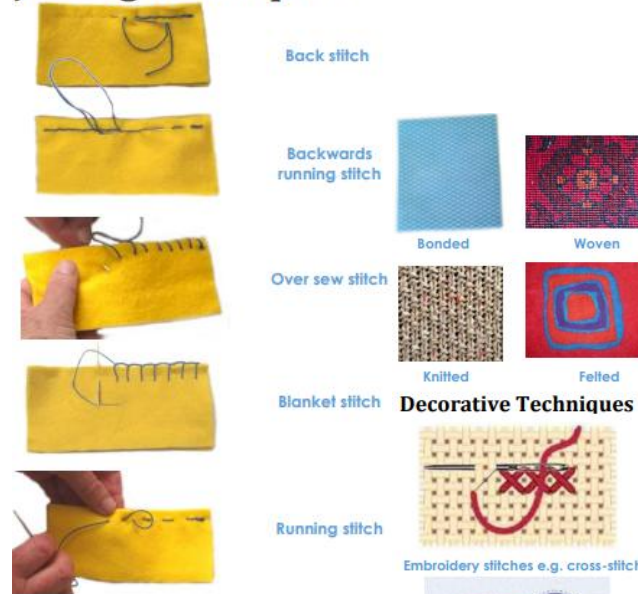
Joining fabric



Finishing techniques



Teaching aids - joining techniques



Cutting out techniques



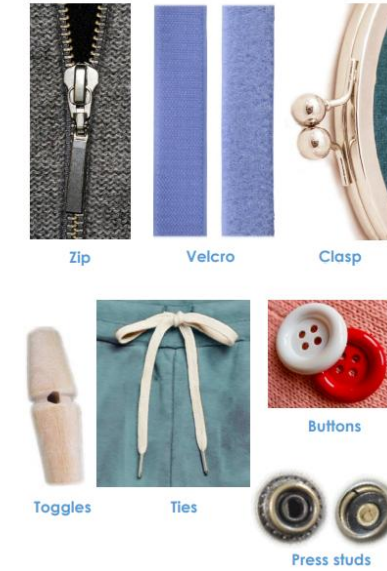
Ensure template is secured to fabric to allow for accuracy. Double sided tape can be used instead of pins to do this.



Place pattern pieces carefully to avoid wastage.

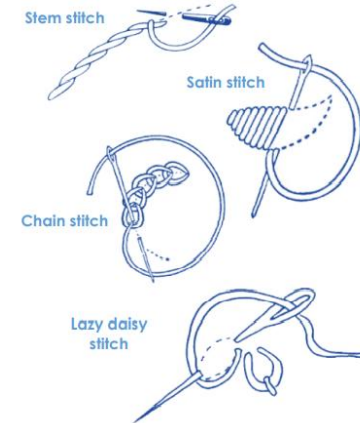
Teaching aids - fasteners

Children may want to use a fastener which should be appropriate for the purpose for the product.



Using stitches as a finish for the product.

Stitches



Appliqué



Embroidery

Example Ideas

- puppet
- mascot

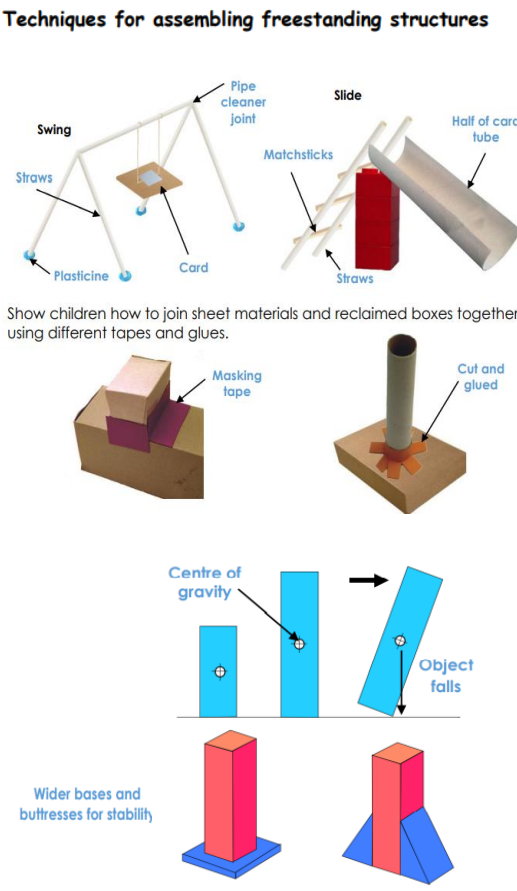
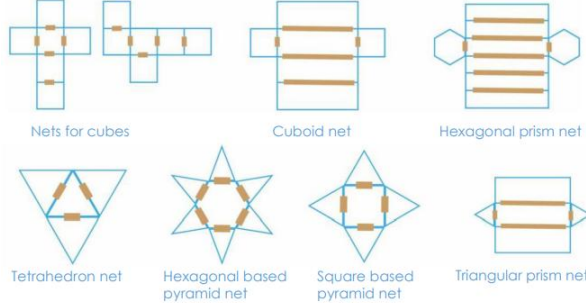
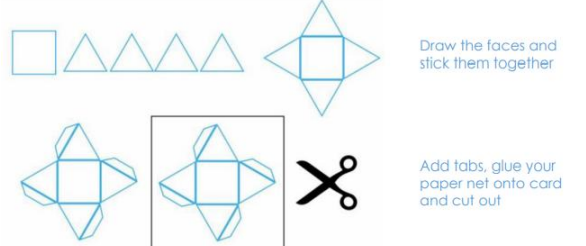
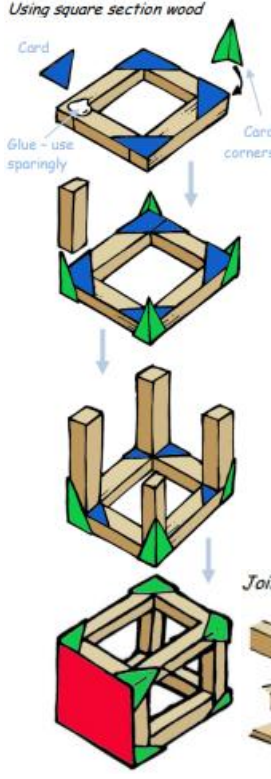
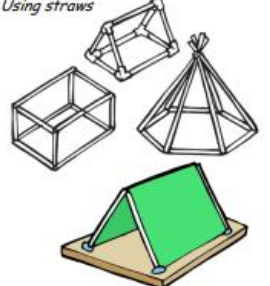
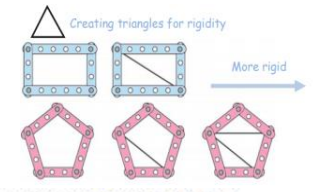
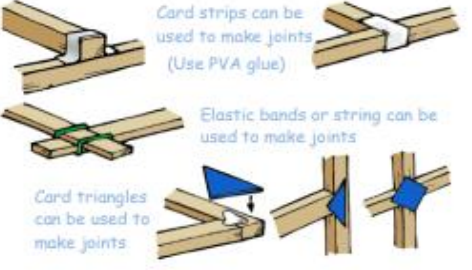
- pencil case
- wallet
- bag

- drawstring bag
- mobile phone case
- tablet case



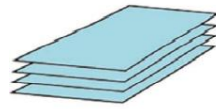
Knowledge & Skills Progression - Structures

	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Focus	Children explore a range of free standing structures in the school and local environment. They create their own free standing structure with a focus on how to make it stronger, stiffer and more stable.	Children learn to make a strong shell structure which can be used for a variety of packaging. They gain knowledge about nets and build on their measuring, marking out, cutting and assembling techniques.	Children learn that structures can fail when loaded. They develop the use of techniques for reinforcing and strengthening structures. Children will also research key events and individuals relevant to frame structures.
Design	<p>Generate ideas based on simple design criteria and their own experiences, explaining what they could make. e.g. <i>the structure should stand up on its own, it should be strong enough to carry Teddy</i></p> <p>Develop, model and communicate their ideas through talking, mock-ups and drawings. e.g. <i>label door, roof : cardboard, paper</i></p>	<p>Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product.</p> <p>Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas.</p>	<p>Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources.</p> <p>Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.</p> <p>Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.</p>
Make	<p>Plan by suggesting what to do next. e.g. <i>plan steps as a whole class</i></p> <p>Select and use tools, skills and techniques, explaining their choices.</p> <p>Select new and reclaimed materials and construction kits to build their structures. ~ e.g. <i>boxes, tubes, straws, newspaper</i></p> <p>Use simple finishing techniques suitable for the structure they are creating. e.g. <i>painting, decorating with materials and media</i></p>	<p>Order the main stages of making.</p> <p>Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy.</p> <p>Explain their choice of materials according to functional properties and aesthetic qualities.</p> <p>Use finishing techniques suitable for the product they are creating.</p>	<p>Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used.</p> <p>Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. e.g. <i>hot glue gun, elastic bands, masking tape</i></p> <p>Use finishing and decorative techniques suitable for the product they are designing and making.</p>
Evaluate	<p>Explore a range of existing freestanding structures in the school and local environment – take photos and label with technical vocabulary e.g. <i>wall, tower, framework, base, joint, metal, wood, plastic, brick, triangle, square, rectangle, cuboid, cube</i></p> <p>Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.</p>	<p>Investigate and evaluate a range of existing shell structures including the materials, components and techniques that have been used. e.g. <i>What is the purpose of the shell structure – protecting, containing, presenting? How has it been stiffened i.e. folded, corrugated, ribbed, laminated?</i></p> <p>Test and evaluate their own products against design criteria and the intended user and purpose.</p>	<p>Investigate and evaluate a range of existing frame structures.</p> <p>Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. e.g. <i>which constructions are the strongest?</i></p> <p>Research key events and individuals relevant to frame structures. e.g. <i>Stephen Sauvestre – a designer of the Eiffel Tower; Thomas Farnolls Pritchard – designer of the Iron Bridge.</i></p>

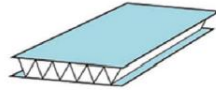
<p>Key Vocabulary</p>	<p>Cut, fold, join, fix structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved metal, wood, plastic</p>	<p>shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating</p>	<p>frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent</p>
<p>Technical Knowledge and Understanding</p>	<p>Know how to make freestanding structures stronger, stiffer and more stable. e.g. folding materials</p> <p>Know and use technical vocabulary relevant to the project.</p>	<p>Develop and use knowledge of how to construct strong, stiff shell structures.</p> <p>Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes.</p> <p>Know and use technical vocabulary relevant to the project.</p>	<p>Understand how to strengthen, stiffen and reinforce 3-D frameworks. e.g. using triangulation to add strength to a structure.</p> <p>Know and use technical vocabulary relevant to the project.</p>
<p>Picture progression</p>	<p>Techniques for assembling freestanding structures</p>  <p>Swing Straws Pipe cleaner joint Slide Matchsticks Straws Half of card tube Plasticine Card Masking tape Cut and glued</p> <p>Show children how to join sheet materials and reclaimed boxes together using different tapes and glues.</p> <p>Centre of gravity Object falls Wider bases and butresses for stability</p>	<p>Assemble and evaluate 3-D shapes using standard sized card squares, rectangles, equilateral triangles, isosceles triangles and hexagons, joined with masking tape.</p>  <p>Nets for cubes Cuboid net Hexagonal prism net Tetrahedron net Hexagonal based pyramid net Square based pyramid net Triangular prism net</p> <p>Creating the net for the product you are designing and making without using computer aided design:</p>  <p>Draw the faces and stick them together Add tabs, glue your paper net onto card and cut out</p>	<p><i>Using square section wood</i></p>  <p>Card Glue - use sparingly Card corners</p> <p><i>Using straws</i></p>  <p>Understanding triangulation</p> <p>Creating triangles for rigidity</p>  <p>More rigid</p> <p><i>Joining thin sectioned pieces of wood</i></p>  <p>Card strips can be used to make joints (Use PVA glue)</p> <p>Elastic bands or string can be used to make joints</p> <p>Card triangles can be used to make joints</p>

As a freestanding structure becomes taller its centre of gravity rises. Stability in a structure can generally be increased by making the base wider, making the base heavier or adding buttresses.

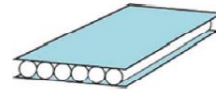
Stiffening and strengthening sheet materials



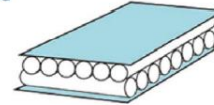
Laminating – glue together several layers of card



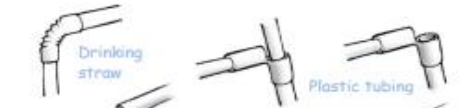
Corrugating – zig-zag a piece of paper or card and glue in between two layers of card



Ribbing – glue layers of straws between layers of card



Joining straws



Example Ideas

- Local landmarks
- London landmarks
- Bridges
- Castles
- Animal enclosure

- Gift boxes
- Desk tidy
- Recyclable lunchboxes
- Money box

- Bird House
- Greenhouse
- Tent
- Kite















Knowledge & Skills Progression - Cooking and Nutrition

	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Focus	Children learn about the different food groups and discuss which foods are classed as fruits and vegetables. They gain knowledge about where these foods are grown and use basic principles of a healthy and varied diet to produce a healthy snack.	Children plan the main stages of a recipe to make a balanced dish. They gain knowledge about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught	Children learn about seasonality in relation to food products and also research how key chefs have influenced eating habits to promote varied and healthy diets. Children learn to combine ingredients using different techniques and write a step-by-step recipe including a list of ingredients, equipment and utensils.
Design	<p>Design appealing products for a particular user based on simple design criteria. <i>e.g. a healthy snack for Goldilocks</i></p> <p>Generate initial ideas and design criteria through investigating a variety of fruit and vegetables. <i>e.g. What words can we use to describe the shape, colour, feel, taste, smell?</i></p> <p>Communicate these ideas through talk and drawings</p>	<p>Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose.</p> <p>Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.</p>	<p>Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification.</p> <p>Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose.</p> <p>Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas.</p>
Make	<p>Use simple utensils and equipment to <i>e.g. peel, cut, slice, squeeze, grate and chop safely.</i></p> <p>Select from a range of fruit and vegetables according to their characteristics <i>e.g. colour, texture and taste to create a chosen product.</i></p>	<p>Plan the main stages of a recipe, listing ingredients, utensils and equipment.</p> <p>Select and use appropriate utensils and equipment to prepare and combine ingredients.</p> <p>Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.</p>	<p>Write a step-by-step recipe, including a list of ingredients, equipment and utensils <i>e.g. Once you have kneaded your dough, carefully...</i></p> <p>Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients. <i>e.g.. measuring scales to weigh ingredients</i> <i>To combine - knead, beat, rub and mix ingredients</i></p> <p>Make, decorate and present the food product appropriately for the intended user and purpose <i>e.g.. Understand that food needs to look appealing, as well as taste good</i></p>
Evaluate	<p>Taste and evaluate a range of fruit and vegetables to determine the user's preference</p> <p>Evaluate ideas and finished product against design criteria <i>e.g. does it meet the intended purpose</i></p> <p>Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. <i>e.g. what fruits and vegetables go well together?</i></p> <p>Evaluate ideas and finished products against design criteria, including intended user and purpose.</p>	<p>Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using <i>e.g. tables and simple graphs.</i></p> <p>Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.</p>	<p>Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using <i>e.g. tables/graphs/charts such as star diagrams.</i></p> <p>Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements.</p> <p>Understand how key chefs have influenced eating habits to promote varied and healthy diets. <i>e.g. Jamie Oliver – healthy schools</i></p>

Key Vocab	flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet sensory vocabulary: soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard	texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet	Ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs, fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality, utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble
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Technical Knowledge and Understanding	Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The eatwell plate. Know and use technical and sensory vocabulary relevant to the project	Know how to use appropriate equipment and utensils to prepare and combine food. Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. e.g. Where do different meats/fish/cheese/eggs come from? How and why are they processed? Know and use relevant technical and sensory vocabulary appropriately.	Know how to use utensils and equipment including heat sources to prepare and cook food. Understand about seasonality in relation to food products and the source of different food products. Know and use relevant technical and sensory vocabulary.
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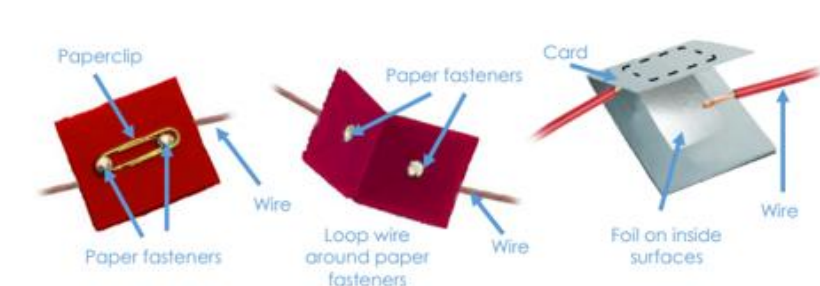
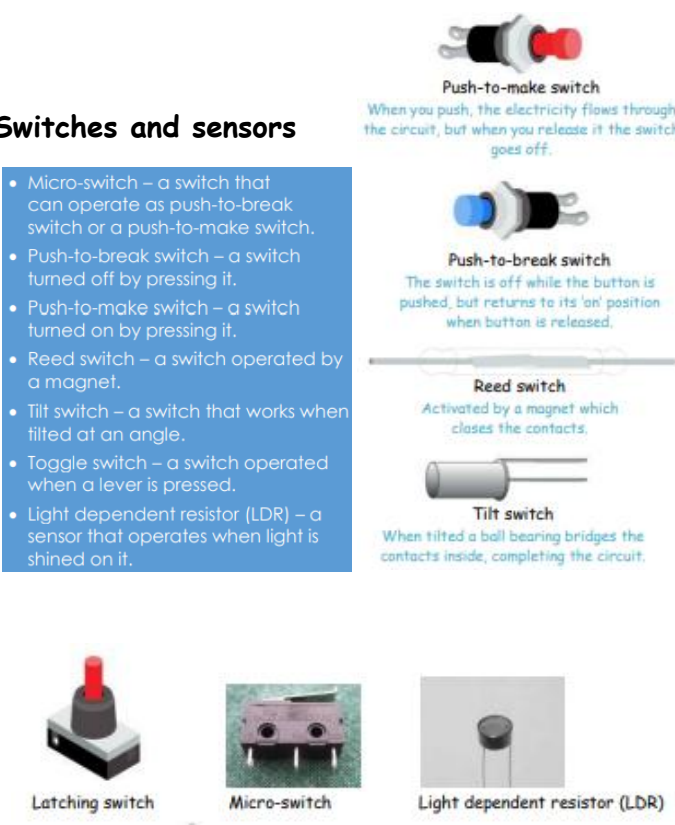
Picture progression	 <p>Peeling Cutting Slicing</p> <p>Grating Squeezing</p> <table border="1" data-bbox="392 1029 824 1268"> <thead> <tr> <th colspan="4">Food Processing Equipment</th> </tr> <tr> <th>Utensil</th> <th>Food</th> <th>Effect</th> <th>Mouth feel</th> </tr> </thead> <tbody> <tr> <td></td> <td>Orange</td> <td>Makes Juice</td> <td>Liquid</td> </tr> <tr> <td></td> <td>Apple</td> <td>Unpeeled apple</td> <td>Crunchy</td> </tr> <tr> <td></td> <td>Carrot</td> <td>Thin rings</td> <td>Crispy hard</td> </tr> </tbody> </table>	Food Processing Equipment				Utensil	Food	Effect	Mouth feel		Orange	Makes Juice	Liquid		Apple	Unpeeled apple	Crunchy		Carrot	Thin rings	Crispy hard	 <p>Grating cheese Spreading butter on bread</p> <p>Cutting using the bridge technique Cutting using the claw technique</p> <table border="1" data-bbox="981 1005 1489 1225"> <thead> <tr> <th colspan="7">Analyzing existing products</th> </tr> <tr> <th>Filling</th> <th>Appearance</th> <th>Smell</th> <th>Flavour/Taste</th> <th>Texture</th> <th>Dislike</th> <th>Neither</th> <th>Like</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Word bank</td> <td>Colourful Dark/pale Greasy Moist</td> <td>Fruity Meaty Smoky Oniony Garlicky Fisty</td> <td>Salty Herby Spicy Fisty Smoky</td> <td>Crispy Crunchy Soft Chewy Sticky Smooth Hard</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Analyzing existing products							Filling	Appearance	Smell	Flavour/Taste	Texture	Dislike	Neither	Like	1								2								3								4								Word bank	Colourful Dark/pale Greasy Moist	Fruity Meaty Smoky Oniony Garlicky Fisty	Salty Herby Spicy Fisty Smoky	Crispy Crunchy Soft Chewy Sticky Smooth Hard				<p>Possible techniques that children could use</p>  <p>Mixing to combine ingredients if making savoury muffins or scones</p> <p>Kneading a bread dough</p> <p>Rubbing in to mix fat and flour if making a yeast based product</p> <table border="1" data-bbox="1585 1013 2105 1165"> <thead> <tr> <th>Type of cultural/seasonal food product</th> <th>Appearance</th> <th>Smell</th> <th>Texture</th> <th>Taste</th> </tr> </thead> <tbody> <tr> <td>Savoury scone</td> <td>Golden/rough</td> <td>Fresh/baked</td> <td>Crumbly</td> <td>Cheesy</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Type of cultural/seasonal food product	Appearance	Smell	Texture	Taste	Savoury scone	Golden/rough	Fresh/baked	Crumbly	Cheesy										
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Example Ideas	<ul style="list-style-type: none"> Vegetable soup A fruit salad A fruit and vegetable smoothie A healthy lunchbox 	<ul style="list-style-type: none"> Toasties Sandwiches Wraps Pitta pockets 	<ul style="list-style-type: none"> Bread Pizza Savoury biscuits Scones Savoury muffin
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Knowledge & Skills Progression - Electrical Systems

	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Focus		Children learn about simple electrical systems in structures and make products incorporating switches, bulbs and buzzers. They gain knowledge about simple circuits and homemade switches	Children learn about more complex switches and circuits and use electrical systems in their products. They practise methods for making secure electrical connections e.g. using automatic wire strippers, twist and tape electrical connections, screw connections and connecting blocks.
Design		<p>Gather information about needs and wants, and develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups.</p> <p>Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams. <i>e.g. create annotated sketches showing how different switches work - push-to-make, push-to-break, toggle switch.</i></p>	<p>Use research to develop a design specification for a functional product that responds automatically to changes in the environment. Take account of constraints including time, resources and cost. <i>e.g. automatic nightlights, alarm systems, security lighting</i> <i>What input devices, e.g. switches, and output devices, e.g. bulbs, have been used?</i></p> <p>Generate and develop innovative ideas and share and clarify these through discussion.</p> <p>Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.</p>
Make		<p>Order the main stages of making.</p> <p>Select from and use tools and equipment to cut, shape, join and finish with some accuracy.</p> <p>Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities <i>e.g. casing for circuit</i></p>	<p>Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components.</p> <p>Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product. <i>e.g. closed switch, pulley and belt system</i></p> <p>Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment.</p>
Evaluate		<p>Investigate and analyse a range of existing battery-powered products.</p> <p>Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.</p>	<p>Continually evaluate and modify the working features of the product to match the initial design specification.</p> <p>Test the system to demonstrate its effectiveness for the intended user and purpose.</p> <p>Investigate famous inventors who developed ground-breaking electrical systems and components. <i>e.g. Thomas Edison - Lightbulb</i></p>

Key Vocabulary	series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip control, program, system, input device, output device	series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart
Technical Knowledge and Understanding	<p>Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers.</p> <p>Apply their understanding of computing to program and control their products.</p> <p>Know and use technical vocabulary relevant to the project</p>	<p>Understand and use electrical systems in their products.</p> <p>Apply their understanding of computing to program, monitor and control their products.</p> <p>Know and use technical vocabulary relevant to the project.</p>
Picture progression	<p>Making secure connections</p>  <p>Handmade switches</p> 	<p>Switches and sensors</p> <ul style="list-style-type: none"> • Micro-switch – a switch that can operate as push-to-break switch or a push-to-make switch. • Push-to-break switch – a switch turned off by pressing it. • Push-to-make switch – a switch turned on by pressing it. • Reed switch – a switch operated by a magnet. • Tilt switch – a switch that works when tilted at an angle. • Toggle switch – a switch operated when a lever is pressed. • Light dependent resistor (LDR) – a sensor that operates when light is shined on it.  <p>Push-to-make switch When you push, the electricity flows through the circuit, but when you release it the switch goes off.</p> <p>Push-to-break switch The switch is off while the button is pushed, but returns to its 'on' position when button is released.</p> <p>Reed switch Activated by a magnet which closes the contacts.</p> <p>Tilt switch When tilted a ball bearing bridges the contacts inside, completing the circuit.</p> <p>Latching switch</p> <p>Micro-switch</p> <p>Light dependent resistor (LDR)</p>

Commercial switches



Push-to-break switch

The switch is off while the button is pushed, but returns to its 'on' position when button is released.



Reed switch

Activated by a magnet – this closes the contacts and completes the circuit.



Push-to-make switch

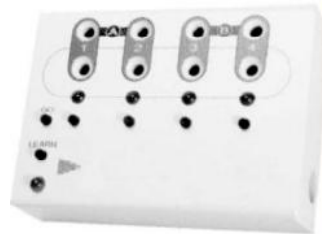
When you push, the electricity flows through the circuit, but when you release it the circuit is broken and the switch is off.

Toggle switch

Simple on/off switch

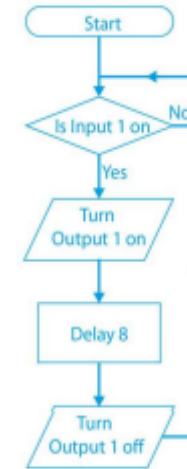


Standalone control box



When children are familiar with using electrical circuits they should be introduced to a simple standalone control box or an interface box. The box will replace their switches and battery, and children can program their product to work automatically.

Example control program



Interface control box



Standalone control box



Example Ideas

- free standing lamp
- light house
- Illuminated sign

- electrical board game
- Ferris Wheel
- Night light