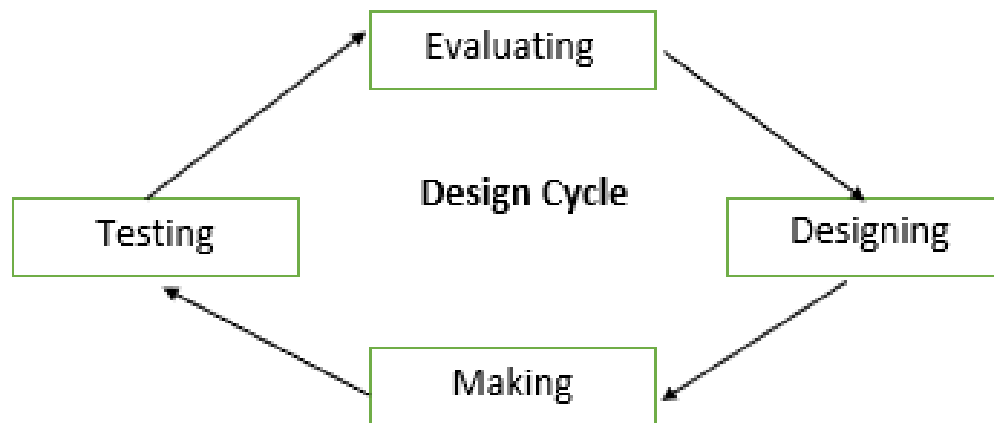




Design Technology Medium Term Plan – 2025/2026

Year 3	Mechanisms – Pop-up/Levers Shell structures Food – nutrition
Year 4	Food – healthy and nutritional cooking Mechanical systems – levers and linkages Structures
Year 5	Textiles – Using computer aided design (CAD) Mechanisms - Wheels and axles, pulleys, Electrical systems Mechanical Systems - Pneumatics
Year 6	Electrical systems Frame structures Textiles



MECHANISMS – Pop-up/Levers

Year 3





Substantive Knowledge

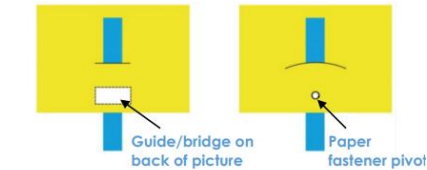
- Explore and use pop-ups, sliders and levers.
- Understand that different mechanisms produce different types of movement.
- Understand a simple pop-up mechanism.
- Know and use technical vocabulary relevant to the project.

Outcome

Pop-up/lever card for a particular occasion

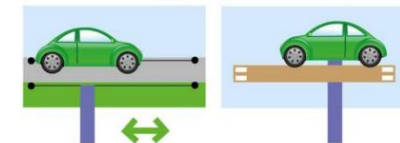
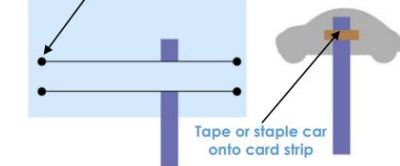
Simple mechanisms move...

-  in a straight line
-  in a straight line, backwards and forwards
-  round and round
-  in a curve



Sliders move from side to side and up and down

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



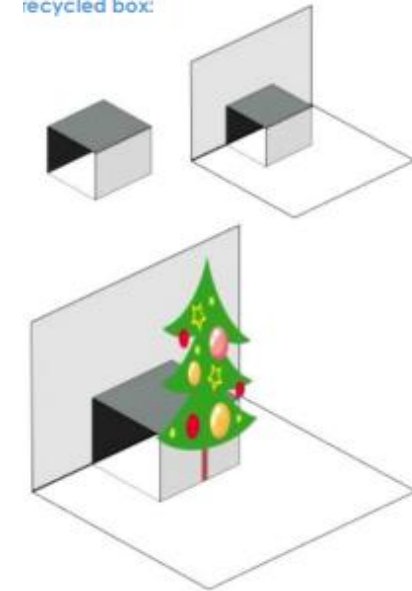
A card strip could be used instead of cutting slots to allow movement



Levers can be used with or without a slot



Making a pop-up from a small section of a recycled box:



1. Cut a slice off a small box.
2. Glue two sides to the paper.
3. Stick a picture to pop up on the front.

Vocabulary

Annotating – adding notes to explain drawing

Attach – join or fasten something to an object

Force – a push, pull or twist

Fulcrum – another word for a pivot

Guide Bridge – a piece of material that makes something go in the right direction and keeps the mechanism in place

Lever – a card strip that moves around a pivot

Mechanism – a device used to create movement

Pivot – to balance or turn about a point

Scoring – partly cutting through card to make it easier to fold

Slider – a rod or card strip that moves when pushed or pulled

Slot – the hole through which a lever is placed

Year 3

Disciplinary Knowledge

Designing

- Investigate and analyse books and, where available, other products with pop-ups, lever and linkage mechanisms.
- Generate ideas for an item, considering the purpose and user.
- Identify a purpose and establish design criteria for a successful project.
- Plan the order of their work before starting and be willing to change their ideas.
- Explore, develop and communicate design proposals by modelling ideas.
- Make labelled drawings.

Making

- Select tools and techniques for making their product.
- Think about their ideas as they make progress and be willing to change things if this help them to improve their work.
- Measure, mark out, cut, score and assemble their components.
- Work safely and accurately with a range of simple tools.
- Assemble, join and combine materials to make a product.
- Use finishing techniques to strengthen and improve the appearance of their product, using a range of equipment including ICT.

Evaluating

- Disassemble and evaluate familiar products such as pop-up books.
- Evaluate their own products and ideas against original design criteria and user needs, as they design and make. *E.g. How well does it meet its intended purpose? Does the product look good? Was it simple to make?*

SHELL STRUCTURES

Year 3

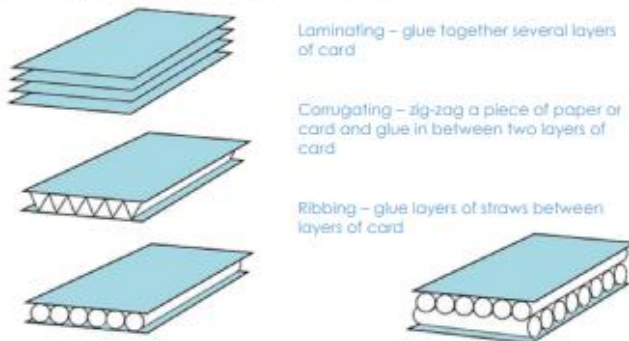
Substantive Knowledge

- A basic understanding of 2-D and 3-D shapes in mathematics
- Develop and use knowledge of how to construct strong, stiff shell structures.
- Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes.
- Know and use technical vocabulary relevant to the project.

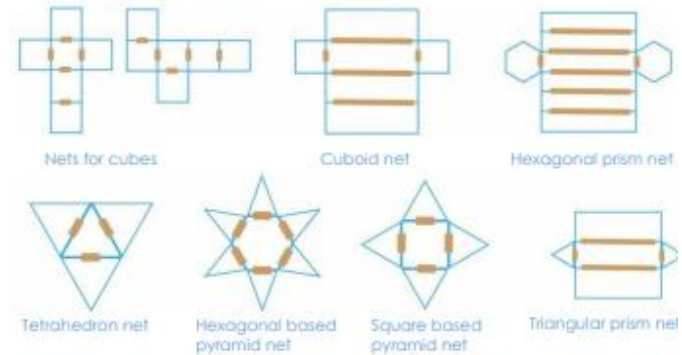
Outcome

Packaging that will protect biscuits and attract customers.

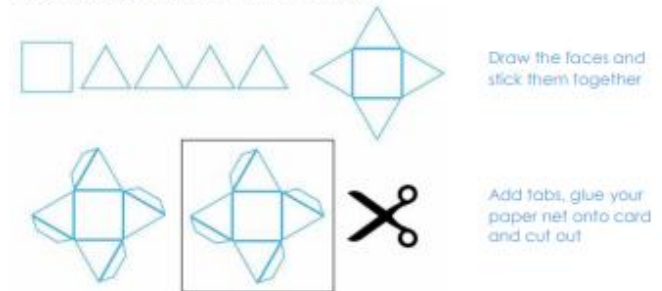
Stiffening and strengthening sheet materials:



Assemble and evaluate 3-D shapes using standard sized card squares, rectangles, equilateral triangles, isosceles triangles and hexagons, joined with masking tape.



Creating the net for the product you are designing and making without using computer aided design:



Vocabulary

Attract – draw something towards an object.
Compressed – flattened by adding pressure to the object.
Cuboid – a solid body with rectangular faces.
Durable – lasts a long time without becoming broken and will protect the contents.
Edge – where two surfaces meet at an angle.
Face – the surface of a 3-D shape.
Flexible – can be bent easily when it is opened out.

Font – the style of lettering

Net – the flat or opened out shape of a 3-D object, such as a box.

Scoring – cutting a line or mark into a material to make it easier to fold.

Shell structure – a hollow structure with a thin outer covering, e.g. packaging.

Stiffening – to strengthen or make stronger.

Tab - an extra piece added to the edge of a shape so that the parts can be joined together.

Vertex – the corner of a shape.

Disciplinary Knowledge

Designing

- Generate ideas for an item, considering the purpose and user.
- Identify a purpose and establish design criteria for a successful project.
- Develop ideas by investigating and analysing existing shell structures including the materials, components and techniques that have been used, to ensure they are planning strong and stable structures.
- Plan the order of their work before starting and be willing to change their ideas.
- Explore, develop and communicate design proposals by modelling ideas.
- Make labelled drawings.

Making

- Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy.
- Develop an understanding of how to reinforce structures.
- Think about their ideas as they make progress and be willing to change things if this help them to improve their work.
- Work safely and accurately with a range of simple tools.
- Explain choice of materials according to functional properties and aesthetic qualities.
- Assemble, join and combine materials to make a product.
- Use finishing techniques suitable for the product being created.

Evaluating

- Test and evaluate their own products and ideas against original design criteria and user needs, as they design and make. *E.g. How well does it meet its intended purpose? Does the product look good? Was it simple to make?*

FOOD - Nutrition

Year 3

Substantive Knowledge

- Understand the importance of personal hygiene.
- Know how to use appropriate equipment and utensils to prepare and combine food hygienically.
- Know about a range of fresh and processed ingredients appropriate for their product.
- Know and use relevant technical and sensory vocabulary appropriately.
- Understand the importance of a balanced diet.
- Know and use technical vocabulary relevant to the project.

Outcome

A healthy sandwich, based on a food combination which works well together, suitable for a specific occasion.

Vocabulary

Appearance: how the food looks to the eye.

Balanced diet: eating a variety of different foods from all five food groups to maintain a healthy diet.

Carbohydrates: foods containing starches such as pasta, potatoes, bread and rice.

Dairy Products: foods made from or containing milk, such as cheese, yoghurt.

Exploded diagram: drawing that shows how the parts are put together.

Fats and oils: are found in foods like olive oil, butter.

Fruit and vegetables: For example, apples, bananas and broccoli.

Hygiene: keeping things clean and healthy to prevent illness.

Ingredients – the items in a mixture or recipe.

Junk food: like crisps, sweets, cakes and chocolate.

Preference test: trying different foods and deciding which you like best.

Processed food: ingredients that have been changed in some way so that they can be eaten or used in cooking, such as tinned fruit or dried fruit.

Protein: found in foods like beans, meat, fish and eggs

Sensory evaluation: evaluating food products in terms of appearance, smell, texture and taste.

Texture: how the food feels in your mouth.

Vegetarian: a person who does not eat meat.

Disciplinary Knowledge

Designing

- Generate and clarify ideas through discussions with peers and adults, considering the purpose and user.
- Identify a purpose and establish design criteria for a successful project.
- Develop ideas by investigating and analysing bread types and fillings, considering appearance, taste, texture and aroma for an appealing product for a particular user and purpose.
- Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs.
- Plan the main stages of a recipe, listing ingredients, utensils and equipment.
- Use annotated exploded diagrams and appropriate ICT, such as web-based recipes to develop and communicate ideas.

Making

- Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.
- Select and use appropriate utensils and equipment to prepare and combine ingredients safely.
- Follow safe procedures for food safety and hygiene.

Evaluating

- Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.
- Suggest modifications to improve the sandwich.

FOOD – Healthy and Nutritional Cooking

Year 4

Food – healthy and nutritional cooking

- Know how to use appropriate equipment and utensils to prepare and combine food hygienically and safely.
- Know about a range of fresh and processed ingredients appropriate for their product and whether they are grown, reared or caught.
- Know the following cooking techniques: sieving, creaming, rubbing in and cooling.
- Know and use technical vocabulary relevant to the project.

Outcome

Cook a range of recipes and be able to identify how they could be made healthier or adapt ingredients to take account of allergies.



Cutting using the bridge technique



Cutting using the claw technique

Vocabulary

Allergy – a life-threatening reaction of the body to a particular food, such as peanuts.

Appearance – how the food looks to the eye.

Beat – to mix ingredients with a circular up and down motion using a spoon or whisk.

Caught – animals that are caught in the wild and used as a food source, e.g. fish.

Chop – to cut into small pieces.

Cooling – make less warm or hot.

Creaming - work (two or more ingredients, typically butter and sugar) together to form a creamy paste.

Frozen food – food preserved by freezing, e.g. frozen peas.

Grown – plants that are grown for eating, e.g. fruit and vegetables.

Harvesting– gathering in crops.

Healthy diet – getting all the nutrients the body needs to work well.

Knead – work dough by pressing, folding and turning until the dough is smooth and elastic.

Peel – remove the outer layer or skin.

Preference test – trying different foods and deciding which you like best.

Processed food – ingredients that have been changed in some way to enable them to be eaten or used in food preparation and cooking.

Quantity – the amount of an ingredient in the recipe.

Reared – animals bred for food, e.g. calves are reared for beef.

Rub in – to combine solid fat with flour using fingers

Seasonal – food that is only available in your country in a particular season.

Sensory evaluation – evaluating food products in terms of the taste, smell, texture and appearance.

Sieving – put an ingredient through a mesh (sieve) to remove lumps.

Tinned – a way of preserving food by heating it to kill bacteria.

Texture – how the product feels in the mouth.

Disciplinary Knowledge

Designing

- Generate and clarify ideas through discussions with peers and adults, considering the purpose and user.
- Identify a purpose and establish design criteria for a successful project.
- Develop ideas by investigating and analysing recipes in terms of how healthy they are, considering what ingredients could be substituted with a healthier alternative or to make the recipe suitable for those with allergies.
They should also consider appearance, taste, texture and aroma for an appealing product for a particular user and purpose.
- Plan the main stages of a recipe, listing ingredients, utensils and equipment.
- Use annotated exploded diagrams and appropriate ICT, such as web-based recipes to develop and communicate ideas.

Making

- Select from a range of ingredients to make appropriate food products, thinking about healthy options.
- Select and use appropriate utensils and equipment to prepare and combine ingredients safely.
- Follow safe procedures for food safety and hygiene.
- Follow a baking recipe.

Evaluating

- Evaluate a recipe, considering the taste, smell, texture and appearance.
- Suggest modifications for improving the finished dish.
- Evaluate the impact of the adaptations to the recipe.

MECHANICAL SYSTEMS – Levers and Linkages

Year 4

Substantive Knowledge

Prior Knowledge

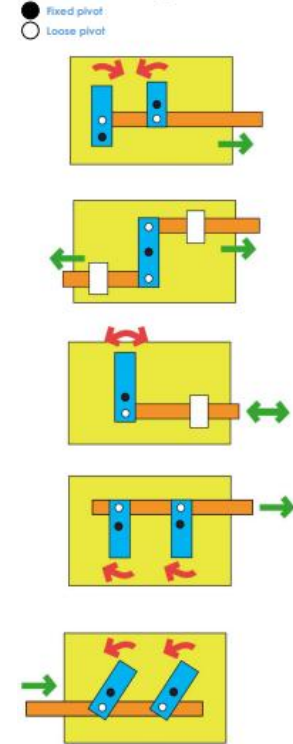
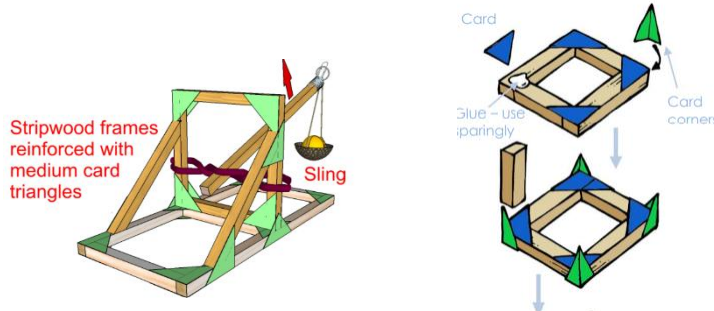
- Explored and used mechanisms such as sliders, levers and pop-ups
- Gained experience of basic cutting, joining and finishing techniques with paper and card.
- Gained some experience of designing, making and evaluating products for a specified user and purpose.

Learning

- Understand and use lever and linkage mechanisms.
- Distinguish between fixed and loose pivots.
- To understand how triangles can be used to reinforce structures.
- To know that structures can be strengthened by manipulating materials and shapes.
- Know and use technical vocabulary relevant to the project.

Outcome

A model Roman catapult built on a Jinks frame.



Lever and linkage mechanisms usually produce oscillating or reciprocating movement:

- Linear – in a straight line
- ↕ Reciprocating – backwards and forwards in a straight line e.g. a slider
- ↻ Rotary – round and round e.g. a wheel, cam, pulley, gear wheel
- ↺ Oscillating – backwards and forwards in an arc e.g. a lever

Vocabulary

Fixed pivot – a fastening that joins levers to a backing.

Guide Bridge – a piece of material that makes something go in the right direction and keeps the mechanism in place.

Jinks frame – a frame made of wood, that uses triangles to strengthen the joints.

Joints – the place where two pieces of wood are joined together.

Lever – a rigid bar which moves around a pivot. The levers in this project will be wooden dowelling.

Linkage - material strips joining one or more levers to produce the type of movement required. It can also be used to describe the whole mechanism.

Loose pivot – a fastening that joins the levers and linkages together.

Mechanism – a device used to create movement.

		<p>Pivot – to balance or turn about a point. Slot – the hole through which a lever is placed.</p>
<p><u>Disciplinary Knowledge</u></p> <p><u>Designing</u></p> <ul style="list-style-type: none"> • Generate ideas considering the purpose and who it is for. • Have a clear idea of what needs to be done and in what order in planning how to use materials, equipment and processes. • Make labelled drawings from different views showing specific features. • Test ideas and evaluate, be prepared to change ideas as a result. • Apply an understanding of how to strengthen and stiffen structures. <p><u>Making</u></p> <ul style="list-style-type: none"> • Select and use appropriate tools and techniques and use them safely. • Measure, mark-out, cut and shape a range of materials. • Join and combine materials and components in a permanent and temporary way. • Communicate idea using annotated drawings using different views and showing specific features. <p><u>Evaluating</u></p> <ul style="list-style-type: none"> • Evaluate their work during the design process by testing and at the end against their criteria. <i>E.g. How well does it meet its intended purpose? Was it simple to make? What did my peers think of it?</i> • Understand how key events and individuals in design and technology have helped shape the world. 		

SHELL STRUCTURES – Viking Boats

Year 4

Substantive Knowledge

Prior Knowledge

- Used nets to construct packaging.
- Gained experience of basic cutting, joining, strengthening and finishing techniques with paper and card.
- Gained some experience of designing, making and evaluating products for a specified user and purpose.

Learning

- Use knowledge of materials to construct an outer shell.
- Experiment with a variety of folds and joins in your product.
- Apply knowledge of shell structures to make the product.
- Explain how the shells are made using annotated diagrams.
- Know and use technical vocabulary relevant to the project.

Outcome

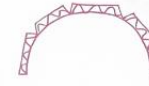
A boat that has a framework on which an outer shell is attached.



Shaping



Score and bend to make a corner.



Score and bend to make a curve.



Bend to make a curve.

Joining



Flange



Slots



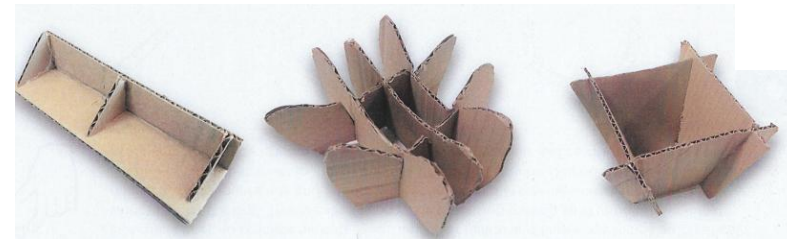
Tab



Single foot fold



Double foot fold



Vocabulary

Flange - a flat surface sticking out from an object, used to fix it to something or to make it stronger.

Float – rest or move on a liquid without sinking.

Foot fold – bend the edge of a material at right angles.

Scoring – cutting a line or mark into sheet material to make it easier to fold.

Slot – a narrow opening in which something can be inserted.

Shell structure – a hollow structure with a thin outer covering.

Sink – go down below the surface of something, especially a liquid.

Stability – how likely something is to fall over.

Tab - an extra piece added to the edge of a shape so that the parts can be joined together.

Waterproof – keeps out water.

Year 4

Disciplinary Knowledge

Designing

- Generate ideas considering the purpose and who it is for.
- Have a clear idea of what needs to be done and in what order in planning how to use materials, equipment and processes.
- Make labelled drawings from different views showing specific features.
- Test ideas and evaluate, be prepared to change ideas as a result.
- Explore a range of joins in order to find the most appropriate for the product.

Making

- Select and use appropriate tools and techniques and use them safely.
- Measure, mark-out, cut and shape a range of materials.
- Join and combine materials and components in a permanent and temporary way.
- Communicate idea using annotated drawings using different views and showing specific features.

Evaluating

- Evaluate their work during the design process by testing and at the end against their criteria. *E.g. How well does it meet its intended purpose? Was it simple to make? What did my peers think of it?*

TEXTILES – Using Computer Aided Design (CAD)

Year 5

Substantive Knowledge

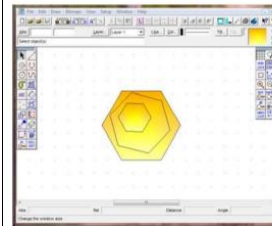
- Use and apply skills in Paint.com to create design for card on a grid where one square represents a single cross stitch.
- Follow a pattern to make card.
- Embroider using cross stitch and back stitch.
- Understand that stitches and fabrics can be used to create a textile product.
- Use knowledge of joining paper to construct a frame for card.
- Know and use technical vocabulary relevant to the project.

Outcome

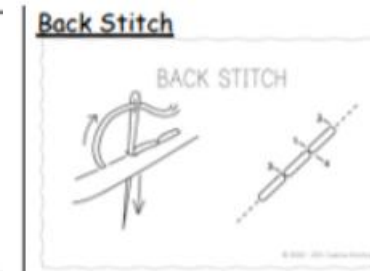
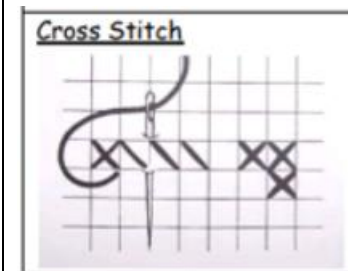
A cross-stitched card for a particular occasion.



Using Paint.com



Embroidery stitches



Vocabulary

Back stitch – stitching where each stitch overlaps the last one.

Binca – an open weave fabric that has holes in place to push the needle through, up and down.

CAD – Computer aided design

Cross stitch – stitches which form a cross shape.

Embroidery – stitches that create a pattern/design on the surface of the binca.



Needle – a thin piece of metal with a point at one end and an 'eye' at the other for thread to attach and then used for stitching.

Pattern – a guide or diagram that you follow and know where each stitch needs to go.

Thread – a piece of spun polyester/cotton or embroidery silk which is used to sew with.

Year 5	<p><u>Disciplinary Knowledge</u></p> <p><u>Designing</u></p> <ul style="list-style-type: none">• Generate innovative ideas through research, e.g. internet, surveys or questionnaires.• Investigate and analyse textile products linked to their final product.• Design, model and communicate ideas through talking, drawing including computer-aided design (Paint.com), including a grid for the cross stitch pattern.• Design purposeful, functional, appealing products for the intended user that are fit for purpose, based on a simple design specification. <p><u>Making</u></p> <ul style="list-style-type: none">• Produce detailed lists of equipment and coloured silks relevant to the product.• Formulate step-by-step plans including the order of stitching.• Select from and use a range of tools and equipment, including CAD, to make a product that is accurately assembled and well finished.• Work within the constraints of time, resources and cost where appropriate. <p><u>Evaluating</u></p> <ul style="list-style-type: none">• Compare the final product to the original design specification.• Critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.• Consider the views of others to improve their work.
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MECHANISMS - WHEELS AND AXLES, PULLEYS, ELECTRICAL SYSTEMS

Year 5

Substantive Knowledge

Prior Knowledge

- A basic understanding of electrical circuits and components in science.
- Building a Jinks frame in Year 4 DT.
- Gained some experience of designing, making and evaluating products for a specified user and purpose.

Learning

- Explore and use wheels, axles and axle holders.
- Distinguish between fixed and freely moving axles. (More info in PowerPoint in folder)
- Know and use technical vocabulary relevant to the project.

Outcome

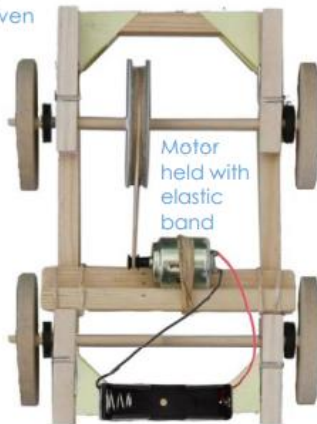
A motorised, pulley-driven vehicle.



Pulley driven vehicle

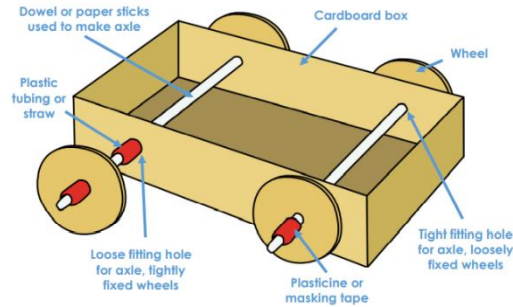
Construct a chassis using wooden strips (frame) or corrugated plastic. Add a pulley and/or wheels and an electric motor with battery housing.

The chassis can be used for a vehicle or to drive machines such as fairground rides.



Motor held with elastic band

Two ways to fix wheels:



Use **pairs of clothes pegs** glued with PVA to the underside of a box. Check the peg holes are large enough to allow axles to move freely. Make sure they are aligned carefully so the vehicle moves in a straight line when the wheel and axle mechanism is added.



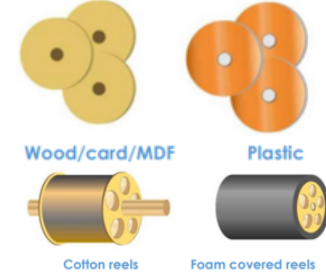
Use **card triangles** with holes for the axle. Check the holes are large enough to allow the axle to move freely. Make sure opposite triangles are aligned carefully so the vehicle moves in a straight line when the wheel and axle mechanism is added.



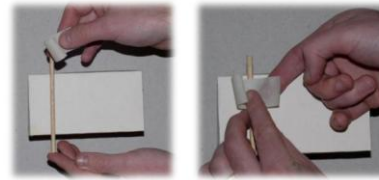
Use **large paper/plastic straws** fixed with masking tape to the underside of a box. Check straws are positioned carefully so the vehicle will move in a straight line when the wheel and axle mechanisms are added. Make sure the straw hole is large enough to allow the axle to move freely. The wheels must be fixed tightly to the axle.



Types of wheels:

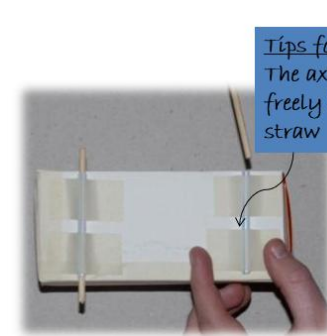


Fixed axle

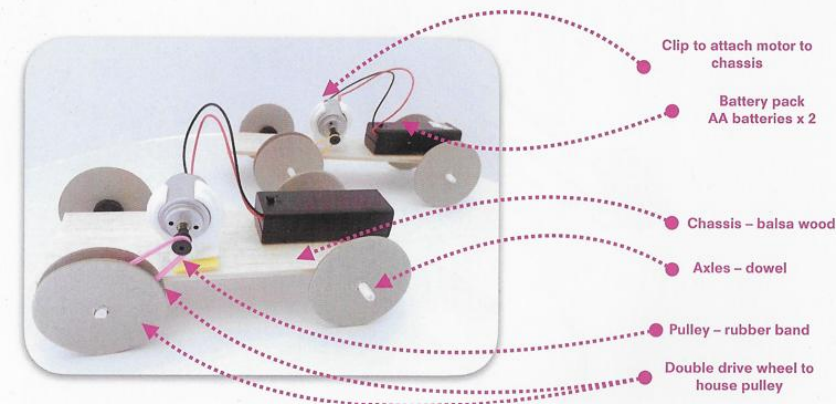


Tips for Teachers: The fixed axle is straightforward to attach but means the wheels must move instead

Moving axle



Tips for Teachers: The axle moves freely inside the straw



Vocabulary

Axle – a rod on which one or more wheels can rotate, either freely or be fixed to and turn with the axle.

Axle holder – the part through which an axle fits and rotates.

Chassis – the frame or base on which a vehicle is built.

Circuit – path through which electricity passes.

Dowel – wooden rods used for making axles to hold wheels.

Drive belt – the belt which connects and transfers movements between two pulleys, such as an elastic band.

Fixed axle – the axle is fixed to the chassis and only the wheels move.

Friction – resistance when two things rub together.

Motor spindle – the rod on the end of a motor that a pulley is attached to.

Moving axle – the axle is attached in a holder so that the axle and wheels move freely.

Pulley – a grooved wheel over which a drive belt (e.g. elastic band) can run.

Year 5	<p><u>Disciplinary Knowledge</u></p> <p><u>Designing</u></p> <ul style="list-style-type: none"> • Gather information about needs and wants, develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups. • Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated drawings, exploded diagrams and drawings from different views. • Develop a simple design specification to guide their thinking. <p><u>Making</u></p> <ul style="list-style-type: none"> • Select from a range of tools and equipment to perform practical tasks, such as cutting and joining to allow movement and finishing. • Select from and use a range of materials and components, such as paper, card, plastic and wood according to their characteristics, and electrical components according to their functional properties and aesthetic qualities. • Produce detailed lists of tools, equipment and materials to make products that are accurately assembled and well finished. • Work within the constraints of time, resources and cost, where appropriate. <p><u>Evaluating</u></p> <ul style="list-style-type: none"> • Evaluate their ideas throughout and make changes as necessary. • Evaluate their ideas against the original design criteria and identify the strengths and areas for improvement in their work. • Evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others in order to improve their model.
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MECHANICAL SYSTEMS - PNEUMATICS

Year 5

Substantive Knowledge

Prior Knowledge

- Explored simple mechanisms, such as sliders, levers and simple structures.
- Learnt how materials can be joined to allow movement.
- Joined and combined materials using simple tools and techniques.

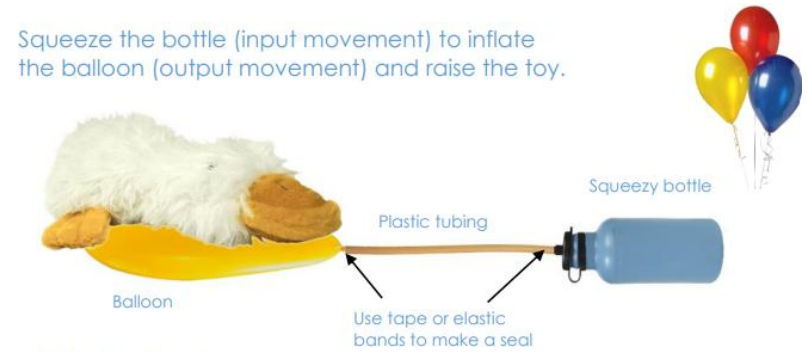
Learning

- Experiment with a variety of systems, such as balloons or different arrangements of syringes and connecting tubes in your products.
- Understand and use pneumatic systems.
- Know and use technical vocabulary relevant to the project.

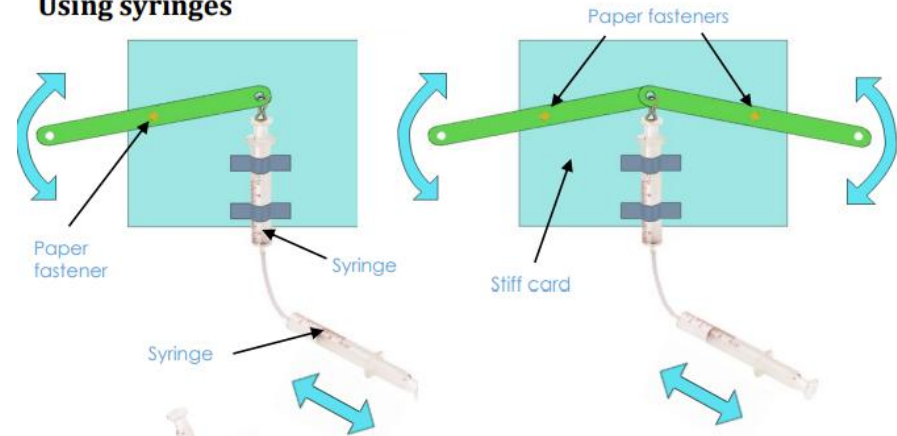
Outcome

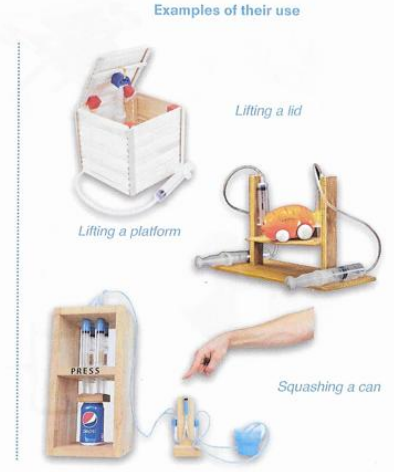
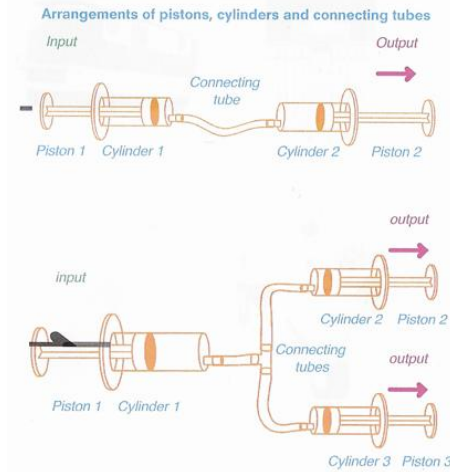
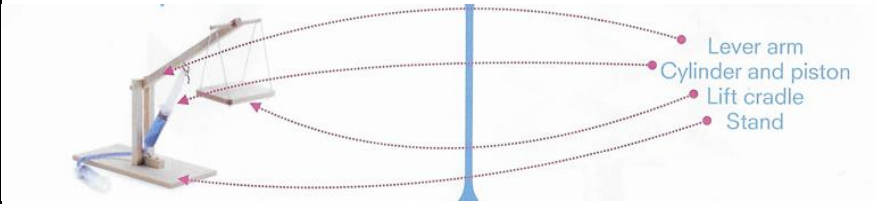
A moving toy.

Crane using Knex and pneumatics.



Using syringes





Vocabulary

Compressed – squashed.

Deflate – remove the pressurised air to allow an object like a balloon to shrink.

Inflate – fill something with air or a gas to make it swell up.

Piston – a disc that slides to and fro in a hollow cylinder, like a syringe.

Pneumatic – filled with air.

Pneumatic system – using pressurised air to move parts in the product.

Pressure – the force produced when you press hard on something.

Syringe - a hollow tube with a nozzle and piston for sucking and blowing air or liquids.

Year 5	<p><u>Disciplinary Knowledge</u></p> <p><u>Designing</u></p> <ul style="list-style-type: none">• Investigate and analyse books, videos and products with pneumatic mechanisms.• Generate realistic and appropriate ideas, using discussion to develop design criteria, focussing on the needs of the user.• Use annotated drawings, exploded diagrams to model and communicate ideas. <p><u>Making</u></p> <ul style="list-style-type: none">• Order the main stages of making.• Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons.• Select from and use finishing techniques suitable for the product they are creating. <p><u>Evaluating</u></p> <ul style="list-style-type: none">• Evaluate their own products and ideas against the design criteria and user needs as they design and make.• Evaluate the quality of the design, manufacture, functionality and fitness for purpose.• Consider the views of others in order to improve their model.
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ELECTRICAL SYSTEMS

Year 6

Substantive Knowledge

Prior Knowledge

- Constructed a simple electrical circuit in science, using bulbs, switches and buzzers; and in DT to power pulley vehicle.
- Cut and joined a variety of construction materials, such as wood, card, plastic, recycled materials and glue.

Learning

- Understand and use electrical systems in their products, incorporating switches, and bulbs.
- Draw accurate circuit diagrams using correct symbols.
- Use knowledge of materials to produce a durable casing that will not conduct electricity.
- Know and use technical vocabulary relevant to the project.

Outcome

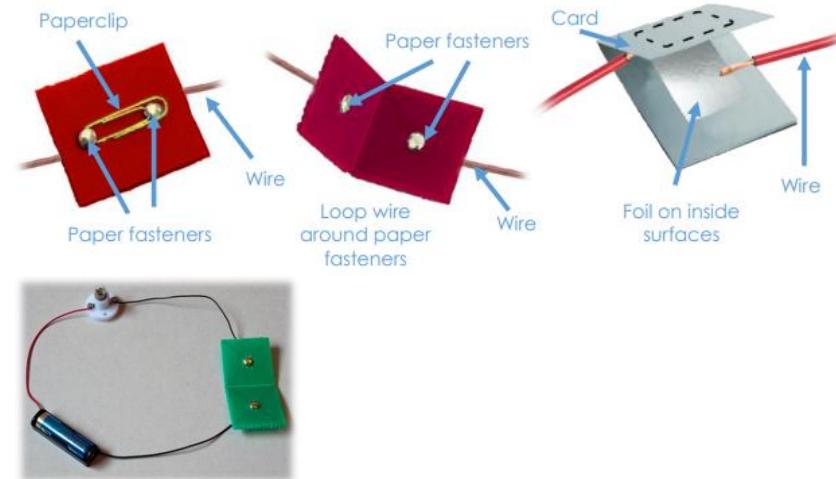
A nightlight for a child.



Making secure connections



Hand made switches



<p>Vocabulary</p> <p>Battery – a store of electricity.</p> <p>Bulb – part of the electrical circuit that produces light.</p> <p>Circuit – path through which electricity passes.</p> <p>Conductor – a material, such as metal, which allows an electric current to pass through it.</p> <p>Durable – lasts a long time without becoming broken.</p>	<p>Insulator – a material which does not easily allow electricity to pass through it, such as plastic.</p> <p>Switch – can be used to complete and break an electrical circuit.</p>
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Year 6	<p><u>Disciplinary Knowledge</u></p> <p><u>Designing</u></p> <ul style="list-style-type: none">• Investigate and analyse a range of existing battery-powered nightlights.• Gather information about the needs and wants of the user, giving consideration to the target audience, developing design criteria through discussion, focusing on features of individual design ideas.• Generate, develop and communicate realistic ideas through discussion and, as appropriate, annotated drawings, cross-sectional and exploded diagrams. <p><u>Making</u></p> <ul style="list-style-type: none">• Order the main stages of making to produce a nightlight with a working electrical circuit and switch.• Use appropriate tools to cut, shape, join and finish with accuracy.• Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities.• Assemble the nightlight according to design criteria. <p><u>Evaluating</u></p> <ul style="list-style-type: none">• Test and evaluate the success of the final product.• Evaluate their ideas and products against the design criteria and identify the strengths and areas for improvement in their work.
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FRAME STRUCTURES

Year 6

Substantive Knowledge

Prior Knowledge

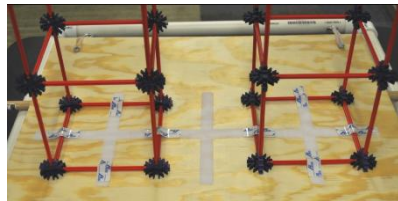
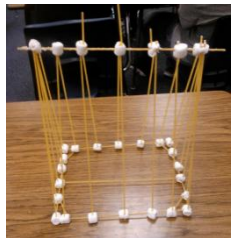
- Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials.
- Basic understanding of what structures are and how they can be made stronger, stiffer and more stable.

Learning

- Know and use technical vocabulary relevant to the project.
- To know that structures can be strengthened and stabilised by manipulating materials and shapes.
- Understand how to strengthen, stiffen and reinforce 3-D frameworks.
- To understand that in the real world, design can impact users in positive and negative ways.

Outcome

A 3D frame structure that is stable and earthquake resistant.



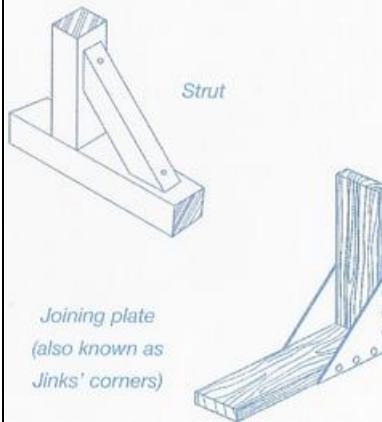
Using Knex



A triangle is rigid. It is very difficult to change its shape.



Frames can be made stronger by adding a **strut** or a **joining plate** to form a triangle shape.

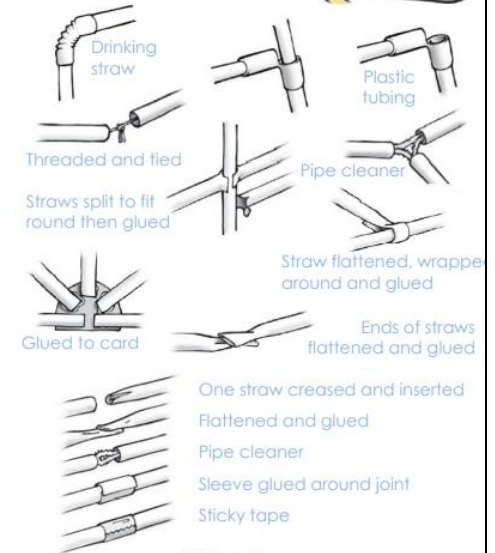


Techniques for building frame structures

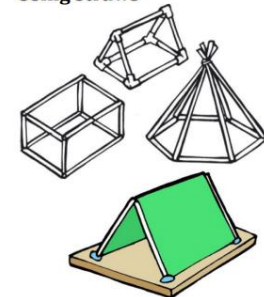
Roll paper to make tubes for construction

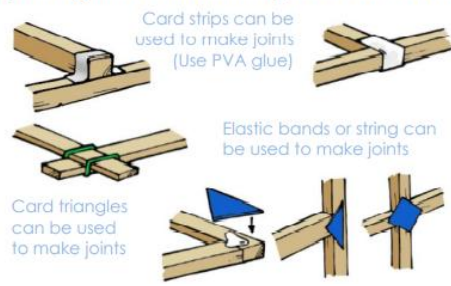
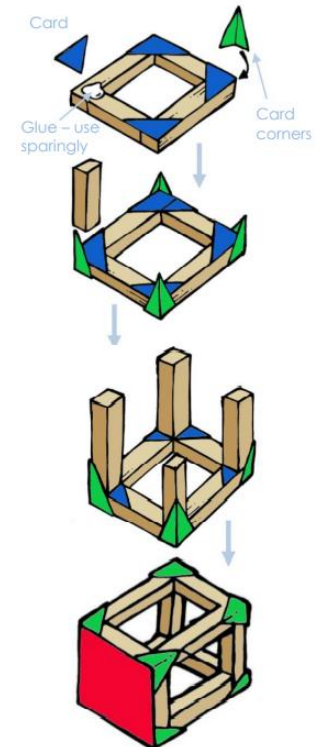


Joining straws



Using straws



	<p>Joining thin sectioned pieces of wood</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> <p>Using square section wood</p>  <p>Card</p> <p>Glue – use sparingly</p> <p>Card corners</p>
<p>Vocabulary</p> <p>Compression – the application of pressure to squeeze an object.</p> <p>Frame structure – a structure made from thin components, e.g. tent frame or building.</p> <p>Joining plate – something attached to a joint to strengthen it (also known as a Jinks’ corner).</p> <p>Rigid – an object that is stiff and does not bend or change shape.</p>	<p>Strut – something that strengthens a structure.</p> <p>Tension – a force pulling on a material or structure.</p> <p>Triangulation – the use of triangular shapes to strengthen a structure.</p> <p>Truss – a structure made of triangles.</p>

Year 6	<p><u>Disciplinary Knowledge</u></p> <p><u>Designing</u></p> <ul style="list-style-type: none">• Research key events and individuals relevant to earthquake resistant buildings.• Investigate and evaluate a range of earthquake resistant structures.• Carry out research into user needs and existing products, using surveys, questionnaires and web-based resources.• Using discussion, develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.• Generate, develop and model innovative ideas, through discussion, modelling and detailed annotated drawings. <p><u>Making</u></p> <ul style="list-style-type: none">• Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used.• Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks.• Use finishing techniques suitable for the structure that is being designed and made. <p><u>Evaluating</u></p> <ul style="list-style-type: none">• Critically evaluate their products against the design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.
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TEXTILES

Year 6

Substantive Knowledge

Prior Knowledge

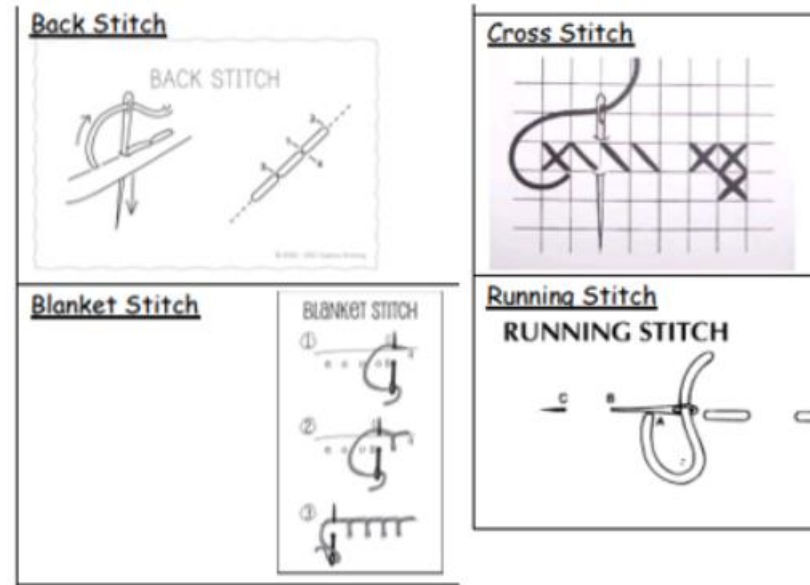
- Use and apply skills in Paint.com to create design for card on a grid where one square represents a single cross stitch.
- Follow a pattern to make card.
- Embroider using cross stitch and back stitch.

Learning

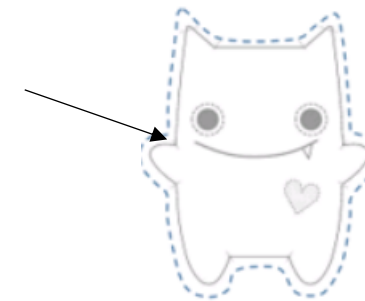
- Understand that fabrics and decorative objects, like sequins and buttons, can be joined (by sticking or sewing) to create a textile product.
- Use a range of different stitches, such as back stitch, running stitch, cross stitch and blanket stitch.
- Understand the importance of consistently sized stitches that are pulled taut so that the joins are secure and strong.
- Develop Paint.com skills to manipulate images.
- Understand that using a template (or paper pattern) helps to accurately mark out a design on the fabric.
- Know and use technical vocabulary relevant to the project.


Outcome

A piece of appliqué (needlework that joins pieces of fabric to make a pattern or picture) for a particular purpose.



Seam allowance



<p>Vocabulary</p> <p>Appliqué – method of stitching/sticking patches of fabric onto a larger piece of fabric.</p> <p>Blanket stitch – hemming stitch, particularly used to edge blankets.</p> <p>Embroidery – stitches that create a pattern/design on the surface of the fabric – by hand or machine.</p> <p>Fabric – used to create a range of products, including toys and clothing. It comes in a range of lengths, widths, colours, finishes and patterns.</p> <p>Needlework – decorative sewing.</p> <p>Pattern – a guide or diagram that is followed to make clothes or other things using a needle and thread.</p>	<p>Pinking shears – special scissors that produce a zig-zag pattern instead of a straight line.</p> <p>Pins – a thin piece of metal with a flat and pointed end to temporarily join fabric together.</p> <p>Running stitch – stitches which do not overlap.]</p> <p>Seam allowance – the distance from the edge of the fabric to where you sew the fabric together.</p> <p>Seam – where two pieces of fabric are joined together by stitching.</p> <p>Stitch – thread passes through fabric to keep it together.</p> <p>Tacking stitch – temporary stitching (like large running stitches) to hold fabric in place.</p> <p>Template – a thin sheet of shaped card, plastic or metal used as a guide for cutting shapes.</p> 
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<p>Year 6</p> <p><u>Disciplinary Knowledge</u></p> <p><u>Designing</u></p> <ul style="list-style-type: none"> • Design a picture/pattern, by considering the main component shapes required and creating an appropriate template. • Consideration should be given to the proportions of the individual components. • The design should be in accordance with the specification, linked to set of design criteria to fit a specific theme. • Annotated drawings should include, stitches used, colours, fabrics and measurements. <p><u>Making</u></p> <ul style="list-style-type: none"> • Produce detailed lists of equipment, fabrics, decorative components and templates relevant to the product. • Formulate step-by-step plans including the order of stitching and joining of the individual components. • Select from and use a range of tools and equipment, including CAD, to make a product that is accurately assembled and well finished. • Sew accurately and with even regularity of stitches. • Work within the constraints of time, resources and cost where appropriate. <p><u>Evaluating</u></p> <ul style="list-style-type: none"> • Evaluate work continually as it is created, suggesting modifications for improvement. • Compare the final product to the original design specification. • Critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work.
