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# SOUND & DISTRICT PRIMARY SCHOOL

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Whole School Design and Technology Progression Map  
Substantive Knowledge & Disciplinary Concepts

Scheme followed: Kapow



### **Who is this document for?**

This progression has been made to help both Class Teachers and the Design and Technology Subject Lead.

For Class Teachers this progression document allows teachers to clearly see what has already been covered in the previous year, the areas which are to be covered in the current year but also where learning continues into the next year. This progression document allows us to see how units are developed over time and built on, as well as exact key knowledge that children must know in each unit and each class.

In addition to the above, it also allows the Design and Technology Subject Lead to know when units are being taught, which resources may be needed across the school at a particular time and also help with monitoring of key knowledge and coverage for triangulation.

YEAR A	Autumn	Spring	Summer
Diamond (EYFS)	<b>Structures</b> Boats	<b>Textiles</b> Bookmarks	<b>Structures</b> Junk Modelling
Emerald (Y1)	<b>Food</b> Fruit and Vegetables	<b>Textiles</b> Puppets	<b>Structures</b> Constructing a Windmill
Ruby (Y2)	<b>Mechanisms</b> Fairground Wheel	<b>Structures</b> Baby Bear's Chair	<b>Mechanisms</b> Making a Moving Monster
Opal (Y3/4) YEAR A	<b>Mechanical Systems</b> Kapow – Making a slingshot car	<b>Food</b> Kapow – Adapting a Recipe (Replacement for – <b>Structures</b> – Pavilion)	<b>Electrical Systems</b> Kapow - Torches
Topaz (Y4/5) YEAR A	<b>Mechanical Systems</b> Kapow – Making a slingshot car	<b>Electrical Systems</b> Kapow - Torches	<b>Food</b> Kapow – Adapting a Recipe (Replacement for – <b>Structures</b> – Pavilion)
Onyx (Y6)	<b>Textiles</b> Combining different fabric shapes	<b>Mechanical Systems</b> Pulleys or gears	<b>Food</b> Celebrating culture and seasonality

YEAR B	Autumn	Spring	Summer
Diamond (EYFS)	<b>Structures</b> Boats	<b>Textiles</b> Bookmarks	<b>Structures</b> Junk Modelling <b>Food</b> Soup
Emerald (Y1)	<b>Food</b> Fruit and Vegetables	<b>Textiles</b> Puppets	<b>Structures</b> Constructing a Windmill
Ruby (Y2)	<b>Mechanisms</b> Fairground Wheel	<b>Structures</b> Baby Bear's Chair	<b>Mechanisms</b> Making a Moving Monster
Opal (Y3/4) YEAR B	<b>Mechanical Systems</b> Kapow – Making a Pop-up book	<b>Food</b> Kapow – What could be healthier?	<b>Electrical Systems</b> Kapow - Doodlers
Topaz (Y4/5) YEAR B	<b>Electrical Systems</b> Kapow - Doodlers	<b>Mechanical Systems</b> Kapow – Making a Pop-up book	<b>Food</b> Kapow – What could be healthier?
Onyx (Y6)	<b>Textiles</b> Kapow - Waistcoats	<b>Electrical Systems</b> Kapow – Steady hand game	<b>Structures</b> Kapow - Playgrounds

YEAR C	Autumn	Spring	Summer
Diamond (EYFS)	Structures Boats	Textiles Bookmarks	Structures Junk Modelling Food Soup
Emerald (Y1)	Food Fruit and Vegetables	Textiles Puppets	Structures Constructing a Windmill
Ruby (Y2)	Mechanisms Fairground Wheel	Structures Baby Bear's Chair	Mechanisms Making a Moving Monster
Opal (Y3/4) YEAR C	Structures Kapow – Constructing a Castle	Food Kapow – Eating Seasonally	Textiles Kapow – Cross-stitch and applique
Topaz (Y4/5) YEAR C	Textiles Kapow – Cross-stitch and applique	Structures Kapow – Constructing a Castle	Food Kapow – Eating Seasonally
Onyx (Y6)	Textiles Kapow - Waistcoats	Electrical Systems Kapow – Steady hand game	Structures Kapow - Playgrounds

EYFS Diamond		Autumn		Spring		Summer	
		Structures Boats	Textiles Bookmarks	Structures Junk Modelling	Food Soup		
Key Skills	Design	<ul style="list-style-type: none"> <li>• *Select appropriate resources</li> <li>• Use gestures, talking and arrangements of materials and components to show design</li> <li>• Use contexts set by the teacher and myself</li> <li>• Use language of designing and making (join, build, shape, longer, shorter, heavier etc.)</li> </ul>					
	Make	<ul style="list-style-type: none"> <li>• Construct with a purpose, using a variety of resources</li> <li>• Use simple tools and techniques</li> <li>• Build / construct with a wide range of objects</li> <li>• Select tools &amp; techniques to shape, assemble and join</li> <li>• Replicate structures with materials / components</li> <li>• Discuss how to make an activity safe and hygienic</li> <li>• Record experiences by drawing, writing, voice recording</li> <li>• Understand different media can be combined for a purpose</li> </ul>					
	Evaluate	<ul style="list-style-type: none"> <li>• Adapt work if necessary</li> <li>• Dismantle, examine, talk about existing objects/structures</li> <li>• Consider and manage some risks</li> <li>• Practise some appropriate safety measures independently</li> <li>• Talk about how things work</li> <li>• Look at similarities and differences between existing objects / materials / tools</li> <li>• Show an interest in technological toys</li> <li>• Describe textures</li> </ul>					
Key Knowledge		<ul style="list-style-type: none"> <li>• To know that 'waterproof' materials are those which do not absorb water.</li> <li>• To know that some objects float and others sink.</li> <li>• To know the different parts of a boat.</li> </ul>	<ul style="list-style-type: none"> <li>• To know that a design is a way of planning our idea before we start.</li> <li>• To know that threading is putting one material through an object.</li> </ul>	<ul style="list-style-type: none"> <li>• To know there are a range to different materials that can be used to make a model and that they are all slightly different.</li> <li>• Making simple suggestions to fix their junk model.</li> </ul>	<ul style="list-style-type: none"> <li>• Begin to understand some food preparation tools, techniques and processes</li> <li>• Practise stirring, mixing, pouring, blending</li> <li>• Discuss how to make an activity safe and hygienic</li> <li>• Discuss use of senses</li> <li>• Understand need for variety in food</li> <li>• Begin to understand that eating well contributes to good health</li> </ul>		

Y1		Autumn	Spring	Summer
<b>Emerald</b>		<b>Food</b> Fruit and Vegetables	<b>Textiles</b> Puppets	<b>Structures</b> Constructing a Windmill
Key Skills	Design	<ul style="list-style-type: none"> <li>• have own ideas</li> <li>• explain what I want to do</li> <li>• explain what my product is for, and how it will work</li> <li>• use pictures and words to plan, begin to use models</li> <li>• design a product for myself following design criteria</li> <li>• research similar existing products</li> </ul>	<ul style="list-style-type: none"> <li>• have own ideas</li> <li>• explain what I want to do</li> <li>• explain what my product is for, and how it will work</li> <li>• use pictures and words to plan, begin to use models</li> <li>• design a product for myself following design criteria</li> <li>• research similar existing products</li> </ul>	<ul style="list-style-type: none"> <li>• have own ideas</li> <li>• explain what I want to do</li> <li>• explain what my product is for, and how it will work</li> <li>• use pictures and words to plan, begin to use models</li> <li>• design a product for myself following design criteria</li> <li>• research similar existing products</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• explain what I'm making and why consider what I need to do next</li> <li>• select tools/ equipment to cut, shape, join, finish and explain choices</li> <li>• measure, mark out, cut and shape, with support</li> <li>• choose suitable materials and explain choices</li> <li>• try to use finishing techniques to make product look good</li> <li>• work in a safe and hygienic manner</li> </ul>	<ul style="list-style-type: none"> <li>• explain what I'm making and why consider what I need to do next</li> <li>• select tools/ equipment to cut, shape, join, finish and explain choices</li> <li>• measure, mark out, cut and shape, with support</li> <li>• choose suitable materials and explain choices</li> <li>• try to use finishing techniques to make product look good</li> <li>• work in a safe and hygienic manner</li> </ul>	<ul style="list-style-type: none"> <li>• explain what I'm making and why consider what I need to do next</li> <li>• select tools/ equipment to cut, shape, join, finish and explain choices</li> <li>• measure, mark out, cut and shape, with support</li> <li>• choose suitable materials and explain choices</li> <li>• try to use finishing techniques to make product look good</li> <li>• work in a safe and hygienic manner</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• talk about my work, linking it to what I was asked to do</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used</li> <li>• talk about existing products, and say what is and isn't good</li> <li>• talk about things that other people have made</li> <li>• begin to talk about what could make product better</li> </ul>	<ul style="list-style-type: none"> <li>• talk about my work, linking it to what I was asked to do</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used</li> <li>• talk about existing products, and say what is and isn't good</li> <li>• talk about things that other people have made</li> <li>• begin to talk about what could make product better</li> </ul>	<ul style="list-style-type: none"> <li>• talk about my work, linking it to what I was asked to do</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used</li> <li>• talk about existing products, and say what is and isn't good</li> <li>• talk about things that other people have made</li> <li>• begin to talk about what could make product better</li> </ul>
	Key Knowledge	<ul style="list-style-type: none"> <li>• Understanding the difference between fruits and vegetables.</li> <li>• To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber).</li> <li>• To know that a blender is a machine which mixes ingredients together into a</li> </ul>	<ul style="list-style-type: none"> <li>• To know that 'joining technique' means connecting two pieces of material together.</li> <li>• To know that there are various temporary methods of joining fabric by using staples, glue or pins.</li> </ul>	<ul style="list-style-type: none"> <li>• To understand that the shape of materials can be changed to improve the strength and stiffness of structures.</li> <li>• To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).</li> </ul>

smooth liquid.

- To know that a fruit has seeds and a vegetable does not.
- To know that fruits grow on trees or vines.
- To know that vegetables can grow either above or below ground.
- To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).

- To understand that different techniques for joining materials can be used for different purposes.
- To understand that a template (or fabric pattern) is used to cut out the same shape multiple times.
- To know that drawing a design idea is useful to see how an idea will look.

- To understand that axles are used in structures and mechanisms to make parts turn in a circle.
- To begin to understand that different structures are used for different purposes.
- To know that a structure is something that has been made and put together.
- To know that materials can be manipulated to improve strength and stiffness.
- To know that a structure is something which has been formed or made from parts.
- To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.
- To know that a 'strong' structure is one which does not break easily.
- To know that a 'stiff' structure or material is one which does not bend easily.
- To know that a client is the person I am designing for.
- To know that design criteria is a list of points to ensure the product meets the clients needs and wants.
- To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity.
- To know that windmill turbines use wind to turn and make the machines inside work.
- To know that a windmill is a structure with sails that are moved by the wind.
- To know the three main parts of a windmill are the turbine, axle and structure.



Y2		Autumn	Spring	Summer
Ruby		Mechanisms Make a Moving Monster	Structures Baby Bear's Chair	Mechanisms Fairground Wheel
Key Skills	Design	<ul style="list-style-type: none"> <li>• have own ideas and plan what to do next</li> <li>• explain what I want to do and describe how I may do it</li> <li>• explain purpose of product, how it will work and how it will be suitable for the user</li> <li>• describe design using pictures, words, models, diagrams, begin to use ICT</li> <li>• design products for myself and others following design criteria</li> <li>• choose best tools and materials, and explain choices</li> <li>• use knowledge of existing</li> </ul>	<ul style="list-style-type: none"> <li>• have own ideas and plan what to do next</li> <li>• explain what I want to do and describe how I may do it</li> <li>• explain purpose of product, how it will work and how it will be suitable for the user</li> <li>• describe design using pictures, words, models, diagrams, begin to use ICT</li> <li>• design products for myself and others following design criteria</li> <li>• choose best tools and materials, and explain choices</li> <li>• use knowledge of existing</li> </ul>	<ul style="list-style-type: none"> <li>• have own ideas and plan what to do next</li> <li>• explain what I want to do and describe how I may do it</li> <li>• explain purpose of product, how it will work and how it will be suitable for the user</li> <li>• describe design using pictures, words, models, diagrams, begin to use ICT</li> <li>• design products for myself and others following design criteria</li> <li>• choose best tools and materials, and explain choices</li> <li>• use knowledge of existing</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• explain what I am making and why it fits the purpose</li> <li>• make suggestions as to what I need to do next.</li> <li>• join materials/components together in different ways</li> <li>• measure, mark out, cut and shape materials and components, with support.</li> <li>• describe which tools I'm using and why</li> <li>• choose suitable materials and explain choices depending on characteristics. use finishing techniques to make product look good</li> <li>• work safely and hygienically</li> </ul>	<ul style="list-style-type: none"> <li>• explain what I am making and why it fits the purpose</li> <li>• make suggestions as to what I need to do next.</li> <li>• join materials/components together in different ways</li> <li>• measure, mark out, cut and shape materials and components, with support.</li> <li>• describe which tools I'm using and why</li> <li>• choose suitable materials and explain choices depending on characteristics. use finishing techniques to make product look good</li> <li>• work safely and hygienically</li> </ul>	<ul style="list-style-type: none"> <li>• explain what I am making and why it fits the purpose</li> <li>• make suggestions as to what I need to do next.</li> <li>• join materials/components together in different ways</li> <li>• measure, mark out, cut and shape materials and components, with support.</li> <li>• describe which tools I'm using and why</li> <li>• choose suitable materials and explain choices depending on characteristics. use finishing techniques to make product look good</li> <li>• work safely and hygienically</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• describe what went well, thinking about design criteria</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion</li> <li>• evaluate how good existing products are</li> <li>• talk about what I would do differently if I were to do it again and why</li> </ul>	<ul style="list-style-type: none"> <li>• describe what went well, thinking about design criteria</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion</li> <li>• evaluate how good existing products are</li> <li>• talk about what I would do differently if I were to do it again and why</li> </ul>	<ul style="list-style-type: none"> <li>• describe what went well, thinking about design criteria</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion</li> <li>• evaluate how good existing products are</li> <li>• talk about what I would do differently if I were to do it again and why</li> </ul>
Key Knowledge		<ul style="list-style-type: none"> <li>• To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.</li> <li>• To know that there is always an input and output in a mechanism.</li> </ul>	<ul style="list-style-type: none"> <li>• To know that shapes and structures with wide, flat bases or legs are the most stable.</li> <li>• To understand that the shape of a structure affects its strength.</li> </ul>	<ul style="list-style-type: none"> <li>• To know that different materials have different properties and are therefore suitable for different uses.</li> </ul>

- To know that an input is the energy that is used to start something working.
- To know that an output is the movement that happens as a result of the input.
- To know that a lever is something that turns on a pivot.
- To know that a linkage mechanism is made up of a series of levers.
- To know some real-life objects that contain mechanisms.

- To know that materials can be manipulated to improve strength and stiffness.
- To know that a structure is something which has been formed or made from parts.
- To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.
- To know that a 'strong' structure is one which does not break easily.
- To know that a 'stiff' structure or material is one which does not bend easily.
- To know that natural structures are those found in nature.
- To know that man-made structures are those made by people.

- To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder.
- To know that it is important to test my design as I go along so that I can solve any problems that may occur.

**Y3/4  
Opal  
YEAR A**

Autumn

**Mechanical Systems**

Kapow – Making a slingshot car

Year 3

Year 4

Key Skills

Design

- begin to research others' needs
- show design meets a range of requirements
- describe purpose of product
- follow a given design criteria
- have at least one idea about how to create product
- create a plan which shows order, equipment and tools
- describe design using an accurately labelled sketch and words
- make design decisions
- explain how product will work
- make a prototype
- begin to use computers to show design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- begin to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

Make

- select suitable tools/equipment, explain choices; begin to use them accurately
- select appropriate materials, fit for purpose.
- work through plan in order
- consider how good product will be
- begin to measure, mark out, cut and shape materials/components with some accuracy
- begin to assemble, join and combine materials and components with some accuracy
- begin to apply a range of finishing techniques with some accuracy

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques with some accuracy

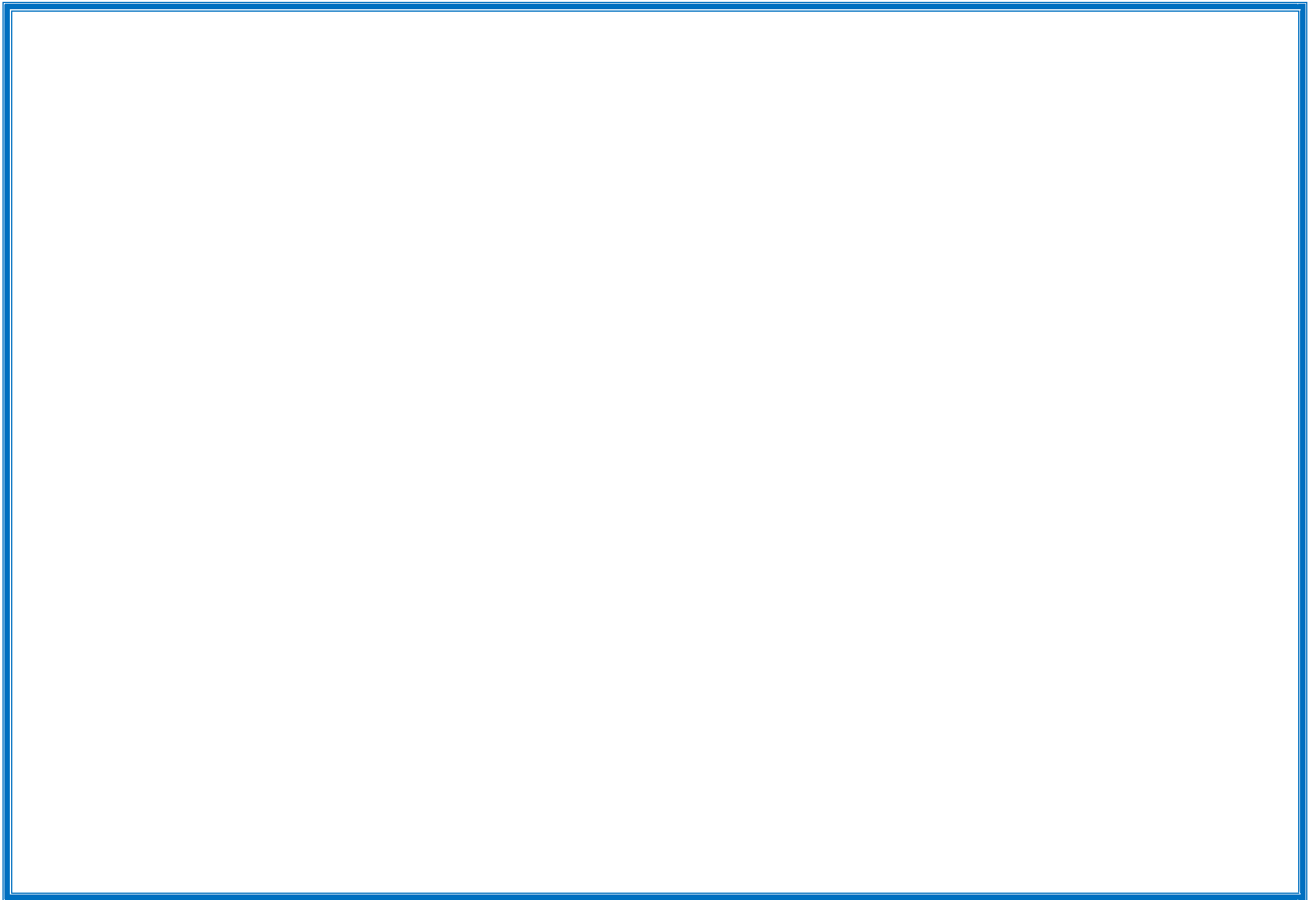
Evaluate

- look at design criteria while designing and making
- use design criteria to evaluate finished product
- say what I would change to make design better
- begin to evaluate existing products, considering: how well they have been made, materials, whether they work, how they have been made, fit for purpose
- begin to understand by whom, when and where products were designed
- learn about some inventors/designers/ engineers/ chefs/ manufacturers of groundbreaking products

- refer to design criteria while designing and making
- use criteria to evaluate product
- begin to explain how I could improve original design
- evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

Key Knowledge

- To understand that all moving things have kinetic energy.
- To understand that kinetic energy is the energy that something (object/person) has by being in motion.
- To know that air resistance is the level of drag on an object as it is forced through the air.
- To understand that the shape of a that products change and evolve over time.
- To know that aesthetics means how an object or product looks in design and technology.
- To know that a template is a stencil you can use to help you draw the same shape accurately.
- To know that a birds-eye view means a view from a high angle (as if a bird in flight).
- To know that graphics are images which are designed to explain or advertise something.
- To know that it is important to assess and evaluate design ideas and models against a list of design criteria.



**Y3/4  
Opal  
YEAR A**

Spring

**Food**

Kapow – Adapting a Recipe

Year 3

Year 4

Design

- begin to research others' needs
- show design meets a range of requirements
- describe purpose of product
- follow a given design criteria
- have at least one idea about how to create product
- create a plan which shows order, equipment and tools
- describe design using an accurately labelled sketch and words
- make design decisions
- explain how product will work
- make a prototype
- begin to use computers to show design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- begin to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

Make

- select suitable tools/equipment, explain choices; begin to use them accurately
- select appropriate materials, fit for purpose.
- work through plan in order
- consider how good product will be
- begin to measure, mark out, cut and shape materials/components with some accuracy
- begin to assemble, join and combine materials and components with some accuracy
- begin to apply a range of finishing techniques with some accuracy

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques with some accuracy

Evaluate

- look at design criteria while designing and making
- use design criteria to evaluate finished product
- say what I would change to make design better
- begin to evaluate existing products, considering: how well they have been made, materials, whether they work, how they have been made, fit for purpose
- begin to understand by whom, when and where products were designed
- learn about some inventors/designers/ engineers/ chefs/ manufacturers of groundbreaking products

- refer to design criteria while designing and making
- use criteria to evaluate product
- begin to explain how I could improve original design
- evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

Key  
Knowledge

- To know that the amount of an ingredient in a recipe is known as the 'quantity.'
- To know that it is important to use oven gloves when removing hot food from an oven.
- To know the following cooking techniques: sieving, creaming, rubbing method, cooling.
- To understand the importance of budgeting while planning ingredients for biscuits

Key Skills

**Y3/4  
Opal  
YEAR A**

**Summer**

**Electrical Systems**

**Kapow - Torches**

**Year 3**

**Year 4**

**Design**

- begin to research others' needs
- show design meets a range of requirements
- describe purpose of product
- follow a given design criteria
- have at least one idea about how to create product
- create a plan which shows order, equipment and tools
- describe design using an accurately labelled sketch and words
- make design decisions
- explain how product will work
- make a prototype
- begin to use computers to show design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- begin to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

**Make**

- select suitable tools/equipment, explain choices; begin to use them accurately
- select appropriate materials, fit for purpose.
- work through plan in order
- consider how good product will be
- begin to measure, mark out, cut and shape materials/components with some accuracy
- begin to assemble, join and combine materials and components with some accuracy
- begin to apply a range of finishing techniques with some accuracy

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques with some accuracy

**Evaluate**

- look at design criteria while designing and making
- use design criteria to evaluate finished product
- say what I would change to make design better
- begin to evaluate existing products, considering: how well they have been made, materials, whether they work, how they have been made, fit for purpose
- begin to understand by whom, when and where products were designed
- learn about some inventors/designers/ engineers/ chefs/ manufacturers of groundbreaking products

- refer to design criteria while designing and making
- use criteria to evaluate product
- begin to explain how I could improve original design
- evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

**Key  
Knowledge**

- To understand that electrical conductors are materials which electricity can pass through.
- To understand that electrical insulators are materials which electricity cannot pass through.
- To know that a battery contains stored electricity that can be used to power products.
- To know that an electrical circuit must be complete for electricity to flow.
- To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens.
- To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison.
- To know that a switch can be used to complete and break an electrical circuit.

Key Skills

**Y4/5  
Topaz  
YEAR A**

Autumn

**Mechanical Systems**

Kapow – Making a slingshot car

Year 4

Year 5

Key Skills

Design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

- use internet and questionnaires for research and design ideas \*take a user's view into account when designing
- begin to consider needs/wants of individuals/groups when designing and ensure product is fit for purpose
- create own design criteria
- have a range of ideas
- produce a logical, realistic plan and explain it to others.
- use cross-sectional planning and annotated sketches
- make design decisions considering time and resources.
- clearly explain how parts of product will work.
- model and refine design ideas by making prototypes and using pattern pieces.
- use computer-aided designs

Make

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques with some accuracy

- use selected tools/equipment with good level of precision
- produce suitable lists of tools, equipment/materials needed
- select appropriate materials, fit for purpose; explain choices, considering functionality
- create and follow detailed stepby-step plan
- explain how product will appeal to an audience
- mainly accurately measure, mark out, cut and shape materials/components
- mainly accurately assemble, join and combine materials/components
- mainly accurately apply a range of finishing techniques
- use techniques that involve a small number of steps
- begin to be resourceful with practical problems

Evaluate

- refer to design criteria while designing and making
- use criteria to evaluate product
- begin to explain how I could improve original design \*evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

- evaluate quality of design while designing and making
- evaluate ideas and finished product against specification, considering purpose and appearance.
- test and evaluate final product
- evaluate and discuss existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- begin to evaluate how much products cost to make and how innovative they are
- research how sustainable materials are
- talk about some key inventors/designers/ engineers/ chefs/manufacturers of groundbreaking products

## Key Knowledge

- To understand that all moving things have kinetic energy.
- To understand that kinetic energy is the energy that something (object/person) has by being in motion.
- To know that air resistance is the level of drag on an object as it is forced through the air.
- To understand that the shape of a that products change and evolve over time.
- To know that aesthetics means how an object or product looks in design and technology.
- To know that a template is a stencil you can use to help you draw the same shape accurately.
- To know that a birds-eye view means a view from a high angle (as if a bird in flight).
- To know that graphics are images which are designed to explain or advertise something.
- To know that it is important to assess and evaluate design ideas and models against a list of design criteria.



**Y4/5  
Topaz  
YEAR A**

Spring

**Electrical Systems**

Kapow - Torches

Year 4

Year 5

Key Skills

Design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

- use internet and questionnaires for research and design ideas \*take a user's view into account when designing
- begin to consider needs/wants of individuals/groups when designing and ensure product is fit for purpose
- create own design criteria
- have a range of ideas
- produce a logical, realistic plan and explain it to others.
- use cross-sectional planning and annotated sketches
- make design decisions considering time and resources.
- clearly explain how parts of product will work.
- model and refine design ideas by making prototypes and using pattern pieces.
- use computer-aided designs

Make

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques with some accuracy

- use selected tools/equipment with good level of precision
- produce suitable lists of tools, equipment/materials needed
- select appropriate materials, fit for purpose; explain choices, considering functionality
- create and follow detailed step-by-step plan
- explain how product will appeal to an audience
- mainly accurately measure, mark out, cut and shape materials/components
- mainly accurately assemble, join and combine materials/components
- mainly accurately apply a range of finishing techniques
- use techniques that involve a small number of steps
- begin to be resourceful with practical problems

Evaluate

- refer to design criteria while designing and making
- use criteria to evaluate product
- begin to explain how I could improve original design
- evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

- evaluate quality of design while designing and making
- evaluate ideas and finished product against specification, considering purpose and appearance.
- test and evaluate final product
- evaluate and discuss existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- begin to evaluate how much products cost to make and how innovative they are
- research how sustainable materials are
- talk about some key inventors/designers/ engineers/ chefs/manufacturers of groundbreaking products

Key  
Knowledge

- To understand that electrical conductors are materials which electricity can pass through.
- To understand that electrical insulators are materials which electricity cannot pass through.
- To know that a battery contains stored electricity that can be used to power products.
- To know that an electrical circuit must be complete for electricity to flow.
- To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens.
- To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison.
- To know that a switch can be used to complete and break an electrical circuit.

**Y4/5  
Topaz  
YEAR A**

Summer

**Food**

**Kapow – Adapting a Recipe**

Year 4

Year 5

Key Skills

Design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

- use internet and questionnaires for research and design ideas \*take a user's view into account when designing
- begin to consider needs/wants of individuals/groups when designing and ensure product is fit for purpose
- create own design criteria
- have a range of ideas
- produce a logical, realistic plan and explain it to others.
- use cross-sectional planning and annotated sketches
- make design decisions considering time and resources.
- clearly explain how parts of product will work.
- model and refine design ideas by making prototypes and using pattern pieces.
- use computer-aided designs

Make

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques with some accuracy

- use selected tools/equipment with good level of precision
- produce suitable lists of tools, equipment/materials needed
- select appropriate materials, fit for purpose; explain choices, considering functionality
- create and follow detailed step-by-step plan
- explain how product will appeal to an audience
- mainly accurately measure, mark out, cut and shape materials/components
- mainly accurately assemble, join and combine materials/components
- mainly accurately apply a range of finishing techniques
- use techniques that involve a small number of steps
- begin to be resourceful with practical problems

Evaluate

- refer to design criteria while designing and making
- use criteria to evaluate product
- begin to explain how I could improve original design
- evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

- evaluate quality of design while designing and making
- evaluate ideas and finished product against specification, considering purpose and appearance.
- test and evaluate final product
- evaluate and discuss existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- begin to evaluate how much products cost to make and how innovative they are
- research how sustainable materials are
- talk about some key inventors/designers/ engineers/ chefs/manufacturers of groundbreaking products

Key  
Knowledge

- To know that the amount of an ingredient in a recipe is known as the 'quantity.'
- To know that it is important to use oven gloves when removing hot food from an oven.
- To know the following cooking techniques: sieving, creaming, rubbing method, cooling.
- To understand the importance of budgeting while planning ingredients for biscuits

Y6 YEAR A Onyx		Autumn	Spring	Summer
		Textiles Combining different fabric shapes	Mechanical Systems Pop up Book	Food Come Dine with Me
Key Skills	Design	<ul style="list-style-type: none"> <li>draw on market research to inform design</li> <li>use research of user's individual needs, wants, requirements for design</li> <li>identify features of design that will appeal to the intended user</li> <li>create own design criteria and specification</li> <li>come up with innovative design ideas</li> <li>follow and refine a logical plan.</li> <li>use annotated sketches, crosssectional planning and exploded diagrams</li> <li>make design decisions, considering, resources and cost</li> <li>clearly explain how parts of design will work, and how they are fit for purpose</li> <li>independently model and refine design ideas by making prototypes and using pattern pieces</li> <li>use computer-aided designs</li> </ul>	<ul style="list-style-type: none"> <li>draw on market research to inform design</li> <li>use research of user's individual needs, wants, requirements for design</li> <li>identify features of design that will appeal to the intended user</li> <li>create own design criteria and specification</li> <li>come up with innovative design ideas</li> <li>follow and refine a logical plan.</li> <li>use annotated sketches, crosssectional planning and exploded diagrams</li> <li>make design decisions, considering, resources and cost</li> <li>clearly explain how parts of design will work, and how they are fit for purpose</li> <li>independently model and refine design ideas by making prototypes and using pattern pieces</li> <li>use computer-aided designs</li> </ul>	<ul style="list-style-type: none"> <li>draw on market research to inform design</li> <li>use research of user's individual needs, wants, requirements for design</li> <li>identify features of design that will appeal to the intended user</li> <li>create own design criteria and specification</li> <li>come up with innovative design ideas</li> <li>follow and refine a logical plan.</li> <li>use annotated sketches, crosssectional planning and exploded diagrams</li> <li>make design decisions, considering, resources and cost</li> <li>clearly explain how parts of design will work, and how they are fit for purpose</li> <li>independently model and refine design ideas by making prototypes and using pattern pieces</li> <li>use computer-aided designs</li> </ul>
	Make	<ul style="list-style-type: none"> <li>use selected tools and equipment precisely</li> <li>produce suitable lists of tools, equipment, materials needed, considering constraints</li> <li>select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics</li> <li>create, follow, and adapt detailed step-by-step plans</li> <li>explain how product will appeal to audience; make changes to improve quality</li> <li>accurately measure, mark out, cut and shape materials/components</li> <li>accurately assemble, join and combine materials/components</li> <li>accurately apply a range of finishing techniques</li> </ul>	<ul style="list-style-type: none"> <li>use selected tools and equipment precisely</li> <li>produce suitable lists of tools, equipment, materials needed, considering constraints</li> <li>select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics</li> <li>create, follow, and adapt detailed step-by-step plans</li> <li>explain how product will appeal to audience; make changes to improve quality</li> <li>accurately measure, mark out, cut and shape materials/components</li> <li>accurately assemble, join and combine materials/components</li> <li>accurately apply a range of finishing techniques</li> </ul>	<ul style="list-style-type: none"> <li>use selected tools and equipment precisely</li> <li>produce suitable lists of tools, equipment, materials needed, considering constraints</li> <li>select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics</li> <li>create, follow, and adapt detailed step-by-step plans</li> <li>explain how product will appeal to audience; make changes to improve quality</li> <li>accurately measure, mark out, cut and shape materials/components</li> <li>accurately assemble, join and combine materials/components</li> <li>accurately apply a range of finishing techniques</li> <li>use techniques that involve a number of steps</li> <li>be resourceful with practical problems</li> </ul>

	Evaluate	<ul style="list-style-type: none"> <li>• use techniques that involve a number of steps</li> <li>• be resourceful with practical problems</li> <li>• evaluate quality of design while designing and making; is it fit for purpose?</li> <li>• keep checking design is best it can be.</li> <li>• evaluate ideas and finished product against specification, stating if it's fit for purpose</li> <li>• test and evaluate final product; explain what would improve it and the effect different resources may have had</li> <li>• do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose</li> <li>• evaluate how much products cost to make and how innovative they are</li> <li>• research and discuss how sustainable materials are</li> <li>• consider the impact of products beyond their intended purpose</li> <li>• discuss some key inventors/designers/ engineers/ chefs/manufacturers of groundbreaking products</li> </ul>	<ul style="list-style-type: none"> <li>• use techniques that involve a number of steps</li> <li>• be resourceful with practical problems</li> <li>• evaluate quality of design while designing and making; is it fit for purpose?</li> <li>• keep checking design is best it can be.</li> <li>• evaluate ideas and finished product against specification, stating if it's fit for purpose</li> <li>• test and evaluate final product; explain what would improve it and the effect different resources may have had</li> <li>• do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose</li> <li>• evaluate how much products cost to make and how innovative they are</li> <li>• research and discuss how sustainable materials are</li> <li>• consider the impact of products beyond their intended purpose</li> <li>• discuss some key inventors/designers/ engineers/ chefs/manufacturers of groundbreaking products</li> </ul>	<ul style="list-style-type: none"> <li>• evaluate quality of design while designing and making; is it fit for purpose?</li> <li>• keep checking design is best it can be.</li> <li>• evaluate ideas and finished product against specification, stating if it's fit for purpose</li> <li>• test and evaluate final product; explain what would improve it and the effect different resources may have had</li> <li>• do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose</li> <li>• evaluate how much products cost to make and how innovative they are</li> <li>• research and discuss how sustainable materials are</li> <li>• consider the impact of products beyond their intended purpose</li> <li>• discuss some key inventors/designers/ engineers/ chefs/manufacturers of groundbreaking products</li> </ul>
Key Knowledge	<ul style="list-style-type: none"> <li>• To understand that it is important to design clothing with the client/ target customer in mind.</li> <li>• To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric.</li> <li>• To understand the importance of consistently sized stitches</li> </ul>	<ul style="list-style-type: none"> <li>• To understand how sketches, drawings and diagrams can be used to communicate design ideas.</li> <li>• To know that exploded-diagrams are used to show how different parts of a product fit together.</li> <li>• To know that thumbnail sketches are small drawings to get ideas down on paper quickly.</li> </ul>	<ul style="list-style-type: none"> <li>• To know that 'flavour' is how a food or drink tastes.</li> <li>• To know that many countries have 'national dishes' which are recipes associated with that country.</li> <li>• To know that 'processed food' means food that has been put through multiple changes in a factory.</li> <li>• To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides.</li> <li>• To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork).</li> </ul>	

EYFS YEAR B Diamond		Autumn	Spring		Summer
		Structures Boats	Textiles Bookmarks	Structures Junk Modelling	Food Soup
Key Skills	Design	<ul style="list-style-type: none"> <li>• *Select appropriate resources</li> <li>• Use gestures, talking and arrangements of materials and components to show design</li> <li>• Use contexts set by the teacher and myself</li> <li>• Use language of designing and making (join, build, shape, longer, shorter, heavier etc.)</li> </ul>			
	Make	<ul style="list-style-type: none"> <li>• Construct with a purpose, using a variety of resources</li> <li>• Use simple tools and techniques</li> <li>• Build / construct with a wide range of objects</li> <li>• Select tools &amp; techniques to shape, assemble and join</li> <li>• Replicate structures with materials / components</li> <li>• Discuss how to make an activity safe and hygienic</li> <li>• Record experiences by drawing, writing, voice recording</li> <li>• Understand different media can be combined for a purpose</li> </ul>			
	Evaluate	<ul style="list-style-type: none"> <li>• Adapt work if necessary</li> <li>• Dismantle, examine, talk about existing objects/structures</li> <li>• Consider and manage some risks</li> <li>• Practise some appropriate safety measures independently</li> <li>• Talk about how things work</li> <li>• Look at similarities and differences between existing objects / materials / tools</li> <li>• Show an interest in technological toys</li> <li>• Describe textures</li> </ul>			
Key Knowledge		<ul style="list-style-type: none"> <li>• To know that 'waterproof' materials are those which do not absorb water.</li> <li>• To know that some objects float and others sink.</li> <li>• To know the different parts of a boat.</li> </ul>	<ul style="list-style-type: none"> <li>• To know that a design is a way of planning our idea before we start.</li> <li>• To know that threading is putting one material through an object.</li> </ul>	<ul style="list-style-type: none"> <li>• To know there are a range to different materials that can be used to make a model and that they are all slightly different.</li> <li>• Making simple suggestions to fix their junk model.</li> </ul>	<ul style="list-style-type: none"> <li>• Begin to understand some food preparation tools, techniques and processes</li> <li>• Practise stirring, mixing, pouring, blending</li> <li>• Discuss how to make an activity safe and hygienic</li> <li>• Discuss use of senses</li> <li>• Understand need for variety in food</li> <li>• Begin to understand that eating well contributes to good health</li> </ul>

Y1 YEAR B Emerald		Autumn	Spring	Summer
		Food Fruit and Vegetables	Textiles Puppets	Structures Constructing a Windmill
Key Skills	Design	<ul style="list-style-type: none"> <li>• have own ideas</li> <li>• explain what I want to do</li> <li>• explain what my product is for, and how it will work</li> <li>• use pictures and words to plan, begin to use models</li> <li>• design a product for myself following design criteria</li> <li>• research similar existing products</li> </ul>	<ul style="list-style-type: none"> <li>• have own ideas</li> <li>• explain what I want to do</li> <li>• explain what my product is for, and how it will work</li> <li>• use pictures and words to plan, begin to use models</li> <li>• design a product for myself following design criteria</li> <li>• research similar existing products</li> </ul>	<ul style="list-style-type: none"> <li>• have own ideas</li> <li>• explain what I want to do</li> <li>• explain what my product is for, and how it will work</li> <li>• use pictures and words to plan, begin to use models</li> <li>• design a product for myself following design criteria</li> <li>• research similar existing products</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• explain what I'm making and why consider what I need to do next</li> <li>• select tools/ equipment to cut, shape, join, finish and explain choices</li> <li>• measure, mark out, cut and shape, with support</li> <li>• choose suitable materials and explain choices</li> <li>• try to use finishing techniques to make product look good</li> <li>• work in a safe and hygienic manner</li> </ul>	<ul style="list-style-type: none"> <li>• explain what I'm making and why consider what I need to do next</li> <li>• select tools/ equipment to cut, shape, join, finish and explain choices</li> <li>• measure, mark out, cut and shape, with support</li> <li>• choose suitable materials and explain choices</li> <li>• try to use finishing techniques to make product look good</li> <li>• work in a safe and hygienic manner</li> </ul>	<ul style="list-style-type: none"> <li>• explain what I'm making and why consider what I need to do next</li> <li>• select tools/ equipment to cut, shape, join, finish and explain choices</li> <li>• measure, mark out, cut and shape, with support</li> <li>• choose suitable materials and explain choices</li> <li>• try to use finishing techniques to make product look good</li> <li>• work in a safe and hygienic manner</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• talk about my work, linking it to what I was asked to do</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used</li> <li>• talk about existing products, and say what is and isn't good</li> <li>• talk about things that other people have made</li> <li>• begin to talk about what could make product better</li> </ul>	<ul style="list-style-type: none"> <li>• talk about my work, linking it to what I was asked to do</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used</li> <li>• talk about existing products, and say what is and isn't good</li> <li>• talk about things that other people have made</li> <li>• begin to talk about what could make product better</li> </ul>	<ul style="list-style-type: none"> <li>• talk about my work, linking it to what I was asked to do</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used</li> <li>• talk about existing products, and say what is and isn't good</li> <li>• talk about things that other people have made</li> <li>• begin to talk about what could make product better</li> </ul>



Key Knowledge

- Understanding the difference between fruits and vegetables.
- To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber).
- To know that a blender is a machine which mixes ingredients together into a smooth liquid.
- To know that a fruit has seeds and a vegetable does not.
- To know that fruits grow on trees or vines.
- To know that vegetables can grow either above or below ground.
- To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).

- To know that 'joining technique' means connecting two pieces of material together.
- To know that there are various temporary methods of joining fabric by using staples, glue or pins.
- To understand that different techniques for joining materials can be used for different purposes.
- To understand that a template (or fabric pattern) is used to cut out the same shape multiple times.
- To know that drawing a design idea is useful to see how an idea will look.

- To understand that the shape of materials can be changed to improve the strength and stiffness of structures.
- To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).
- To understand that axles are used in structures and mechanisms to make parts turn in a circle.
- To begin to understand that different structures are used for different purposes.
- To know that a structure is something that has been made and put together.
- To know that materials can be manipulated to improve strength and stiffness.
- To know that a structure is something which has been formed or made from parts.
- To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.
- To know that a 'strong' structure is one which does not break easily.
- To know that a 'stiff' structure or material is one which does not bend easily.
- To know that a client is the person I am designing for.
- To know that design criteria is a list of points to ensure the product meets the clients needs and wants.
- To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity.
- To know that windmill turbines use wind to turn and make the machines inside work.
- To know that a windmill is a structure with sails that are moved by the wind.
- To know the three main parts of a windmill are the turbine, axle and structure.

Y2		Autumn	Spring	Summer
YEAR B		Mechanisms	Structures	Mechanisms
Ruby		Make a Moving Monster	Baby Bear's Chair	Fairground Wheel
Key Skills	Design	<ul style="list-style-type: none"> <li>have own ideas and plan what to do next</li> <li>explain what I want to do and describe how I may do it</li> <li>explain purpose of product, how it will work and how it will be suitable for the user</li> <li>describe design using pictures, words, models, diagrams, begin to use ICT</li> <li>design products for myself and others following design criteria</li> <li>choose best tools and materials, and explain choices</li> <li>use knowledge of existing</li> </ul>	<ul style="list-style-type: none"> <li>have own ideas and plan what to do next</li> <li>explain what I want to do and describe how I may do it</li> <li>explain purpose of product, how it will work and how it will be suitable for the user</li> <li>describe design using pictures, words, models, diagrams, begin to use ICT</li> <li>design products for myself and others following design criteria</li> <li>choose best tools and materials, and explain choices</li> <li>use knowledge of existing</li> </ul>	<ul style="list-style-type: none"> <li>have own ideas and plan what to do next</li> <li>explain what I want to do and describe how I may do it</li> <li>explain purpose of product, how it will work and how it will be suitable for the user</li> <li>describe design using pictures, words, models, diagrams, begin to use ICT</li> <li>design products for myself and others following design criteria</li> <li>choose best tools and materials, and explain choices</li> <li>use knowledge of existing</li> </ul>
	Make	<ul style="list-style-type: none"> <li>explain what I am making and why it fits the purpose</li> <li>make suggestions as to what I need to do next.</li> <li>join materials/components together in different ways</li> <li>measure, mark out, cut and shape materials and components, with support.</li> <li>describe which tools I'm using and why</li> <li>choose suitable materials and explain choices depending on characteristics. use finishing techniques to make product look good</li> <li>work safely and hygienically</li> </ul>	<ul style="list-style-type: none"> <li>explain what I am making and why it fits the purpose</li> <li>make suggestions as to what I need to do next.</li> <li>join materials/components together in different ways</li> <li>measure, mark out, cut and shape materials and components, with support.</li> <li>describe which tools I'm using and why</li> <li>choose suitable materials and explain choices depending on characteristics. use finishing techniques to make product look good</li> <li>work safely and hygienically</li> </ul>	<ul style="list-style-type: none"> <li>explain what I am making and why it fits the purpose</li> <li>make suggestions as to what I need to do next.</li> <li>join materials/components together in different ways</li> <li>measure, mark out, cut and shape materials and components, with support.</li> <li>describe which tools I'm using and why</li> <li>choose suitable materials and explain choices depending on characteristics. use finishing techniques to make product look good</li> <li>work safely and hygienically</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>describe what went well, thinking about design criteria</li> <li>talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion</li> <li>evaluate how good existing products are</li> <li>talk about what I would do differently if I were to do it again and why</li> </ul>	<ul style="list-style-type: none"> <li>describe what went well, thinking about design criteria</li> <li>talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion</li> <li>evaluate how good existing products are</li> <li>talk about what I would do differently if I were to do it again and why</li> </ul>	<ul style="list-style-type: none"> <li>describe what went well, thinking about design criteria</li> <li>talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion</li> <li>evaluate how good existing products are</li> <li>talk about what I would do differently if I were to do it again and why</li> </ul>

Key Knowledge

- To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.
- To know that there is always an input and output in a mechanism.
- To know that an input is the energy that is used to start something working.
- To know that an output is the movement that happens as a result of the input.
- To know that a lever is something that turns on a pivot.
- To know that a linkage mechanism is made up of a series of levers.
- To know some real-life objects that contain mechanisms.

- To know that shapes and structures with wide, flat bases or legs are the most stable.
- To understand that the shape of a structure affects its strength.
- To know that materials can be manipulated to improve strength and stiffness.
- To know that a structure is something which has been formed or made from parts.
- To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.
- To know that a 'strong' structure is one which does not break easily.
- To know that a 'stiff' structure or material is one which does not bend easily.
- To know that natural structures are those found in nature.
- To know that man-made structures are those made by people.

- To know that different materials have different properties and are therefore suitable for different uses.
- To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder.
- To know that it is important to test my design as I go along so that I can solve any problems that may occur.

**Y3/4  
Opal  
YEAR B**

Autumn

**Mechanical Systems**

Kapow – Making a Pop-up book

Year 3

Year 4

Key Skills

Design

- begin to research others' needs
- show design meets a range of requirements
- describe purpose of product
- follow a given design criteria
- have at least one idea about how to create product
- create a plan which shows order, equipment and tools
- describe design using an accurately labelled sketch and words
- make design decisions
- explain how product will work
- make a prototype
- begin to use computers to show design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- begin to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

Make

- select suitable tools/equipment, explain choices; begin to use them accurately
- select appropriate materials, fit for purpose.
- work through plan in order
- consider how good product will be
- begin to measure, mark out, cut and shape materials/components with some accuracy
- begin to assemble, join and combine materials and components with some accuracy
- begin to apply a range of finishing techniques with some accuracy

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
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Evaluate

- look at design criteria while designing and making
- use design criteria to evaluate finished product
- say what I would change to make design better
- begin to evaluate existing products, considering: how well they have been made, materials, whether they work, how they have been made, fit for purpose
- begin to understand by whom, when and where products were designed
- learn about some inventors/designers/ engineers/ chefs/ manufacturers of groundbreaking products

- refer to design criteria while designing and making
- use criteria to evaluate product
- begin to explain how I could improve original design
- evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

Key Knowledge

- To know that mechanisms control movement.
- To understand that mechanisms can be used to change one kind of motion into another.
- To understand how to use sliders, pivots and folds to create paper-based mechanisms.

**Y3/4  
Opal  
YEAR B**

Spring

**Food**

**Kapow – What could be healthier?**

Year 3

Year 4

Key Skills

Design

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Key Knowledge

- To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues.
- To know that I can adapt a recipe to make it healthier by substituting ingredients.
- To know that I can use a nutritional calculator to see how healthy a food option is.
- To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.

**Y3/4  
Opal  
YEAR B**

**Summer**

**Electrical Systems**

**Kapow - Doodlers**

**Year 3**

**Year 4**

**Design**

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**Key  
Knowledge**

- To know that series circuits only have one direction for the electricity to flow.
- To know when there is a break in a series circuit, all components turn off.
- To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.
- To know a motorised product is one which uses a motor to function.

Key Skills

**Y4/5  
Topaz  
YEAR B**

Autumn

**Electrical Systems**

Kapow - Doodlers

Year 4

Year 5

Key Skills

Design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

- use internet and questionnaires for research and design ideas \*take a user's view into account when designing
- begin to consider needs/wants of individuals/groups when designing and ensure product is fit for purpose
- create own design criteria
- have a range of ideas
- produce a logical, realistic plan and explain it to others.
- use cross-sectional planning and annotated sketches
- make design decisions considering time and resources.
- clearly explain how parts of product will work.
- model and refine design ideas by making prototypes and using pattern pieces.
- use computer-aided designs

Make

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
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- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques with some accuracy

- use selected tools/equipment with good level of precision
- produce suitable lists of tools, equipment/materials needed
- select appropriate materials, fit for purpose; explain choices, considering functionality
- create and follow detailed stepby-step plan
- explain how product will appeal to an audience
- mainly accurately measure, mark out, cut and shape materials/components
- mainly accurately assemble, join and combine materials/components
- mainly accurately apply a range of finishing techniques
- use techniques that involve a small number of steps
- begin to be resourceful with practical problems

Evaluate

- refer to design criteria while designing and making
- use criteria to evaluate product
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- discuss by whom, when and where products were designed
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- evaluate quality of design while designing and making
- evaluate ideas and finished product against specification, considering purpose and appearance.
- test and evaluate final product
- evaluate and discuss existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- begin to evaluate how much products cost to make and how innovative they are
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**Y4/5  
Topaz  
YEAR B**

Spring

**Mechanical Systems**

Kapow – Making a Pop-up book

Year 4

Year 5

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**Y4/5  
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YEAR B**

Summer

**Food**

Kapow – What could be healthier?

Year 4

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<b>Y6</b>	Autumn		Spring	Summer
	Textiles		Electrical Systems	Structures
<b>YEAR B</b>	Kapow- Waistcoats		Kapow – Steady hand game	Kapow - Playgrounds
<b>Onyx</b>	Kapow- Waistcoats		Kapow – Steady hand game	Kapow - Playgrounds
Key Skills	Design	<ul style="list-style-type: none"> <li>draw on market research to inform design</li> <li>use research of user's individual needs, wants, requirements for design</li> <li>identify features of design that will appeal to the intended user</li> <li>create own design criteria and specification</li> <li>come up with innovative design ideas</li> <li>follow and refine a logical plan.</li> <li>use annotated sketches, crosssectional planning and exploded diagrams</li> <li>make design decisions, considering, resources and cost</li> <li>clearly explain how parts of design will work, and how they are fit for purpose</li> <li>independently model and refine design ideas by making prototypes and using pattern pieces</li> <li>use computer-aided designs</li> </ul>	<ul style="list-style-type: none"> <li>draw on market research to inform design</li> <li>use research of user's individual needs, wants, requirements for design</li> <li>identify features of design that will appeal to the intended user</li> <li>create own design criteria and specification</li> <li>come up with innovative design ideas</li> <li>follow and refine a logical plan.</li> <li>use annotated sketches, crosssectional planning and exploded diagrams</li> <li>make design decisions, considering, resources and cost</li> <li>clearly explain how parts of design will work, and how they are fit for purpose</li> <li>independently model and refine design ideas by making prototypes and using pattern pieces</li> <li>use computer-aided designs</li> </ul>	<ul style="list-style-type: none"> <li>draw on market research to inform design</li> <li>use research of user's individual needs, wants, requirements for design</li> <li>identify features of design that will appeal to the intended user</li> <li>create own design criteria and specification</li> <li>come up with innovative design ideas</li> <li>follow and refine a logical plan.</li> <li>use annotated sketches, crosssectional planning and exploded diagrams</li> <li>make design decisions, considering, resources and cost</li> <li>clearly explain how parts of design will work, and how they are fit for purpose</li> <li>independently model and refine design ideas by making prototypes and using pattern pieces</li> <li>use computer-aided designs</li> </ul>
	Make	<ul style="list-style-type: none"> <li>use selected tools and equipment precisely</li> <li>produce suitable lists of tools, equipment, materials needed, considering constraints</li> <li>select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics</li> <li>create, follow, and adapt detailed step-by-step plans</li> <li>explain how product will appeal to audience; make changes to improve quality</li> <li>accurately measure, mark out, cut and shape materials/components</li> <li>accurately assemble, join and combine materials/components</li> </ul>	<ul style="list-style-type: none"> <li>use selected tools and equipment precisely</li> <li>produce suitable lists of tools, equipment, materials needed, considering constraints</li> <li>select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics</li> <li>create, follow, and adapt detailed step-by-step plans</li> <li>explain how product will appeal to audience; make changes to improve quality</li> <li>accurately measure, mark out, cut and shape materials/components</li> <li>accurately assemble, join and combine materials/components</li> </ul>	<ul style="list-style-type: none"> <li>use selected tools and equipment precisely</li> <li>produce suitable lists of tools, equipment, materials needed, considering constraints</li> <li>select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics</li> <li>create, follow, and adapt detailed step-by-step plans</li> <li>explain how product will appeal to audience; make changes to improve quality</li> <li>accurately measure, mark out, cut and shape materials/components</li> <li>accurately assemble, join and combine materials/components</li> <li>accurately apply a range of finishing techniques</li> </ul>

		<ul style="list-style-type: none"> <li>accurately apply a range of finishing techniques</li> <li>use techniques that involve a number of steps</li> <li>be resourceful with practical problems</li> </ul>	<ul style="list-style-type: none"> <li>accurately apply a range of finishing techniques</li> <li>use techniques that involve a number of steps</li> <li>be resourceful with practical problems</li> </ul>	<ul style="list-style-type: none"> <li>use techniques that involve a number of steps</li> <li>be resourceful with practical problems</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>evaluate quality of design while designing and making; is it fit for purpose?</li> <li>keep checking design is best it can be.</li> <li>evaluate ideas and finished product against specification, stating if it's fit for purpose</li> <li>test and evaluate final product; explain what would improve it and the effect different resources may have had</li> <li>do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose</li> <li>evaluate how much products cost to make and how innovative they are</li> <li>research and discuss how sustainable materials are</li> <li>consider the impact of products beyond their intended purpose</li> <li>discuss some key inventors/designers/ engineers/ chefs/manufacturers of groundbreaking products</li> </ul>	<ul style="list-style-type: none"> <li>evaluate quality of design while designing and making; is it fit for purpose?</li> <li>keep checking design is best it can be.</li> <li>evaluate ideas and finished product against specification, stating if it's fit for purpose</li> <li>test and evaluate final product; explain what would improve it and the effect different resources may have had</li> <li>do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose</li> <li>evaluate how much products cost to make and how innovative they are</li> <li>research and discuss how sustainable materials are</li> <li>consider the impact of products beyond their intended purpose</li> <li>discuss some key inventors/designers/ engineers/ chefs/manufacturers of groundbreaking products</li> </ul>	<ul style="list-style-type: none"> <li>evaluate quality of design while designing and making; is it fit for purpose?</li> <li>keep checking design is best it can be.</li> <li>evaluate ideas and finished product against specification, stating if it's fit for purpose</li> <li>test and evaluate final product; explain what would improve it and the effect different resources may have had</li> <li>do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose</li> <li>evaluate how much products cost to make and how innovative they are</li> <li>research and discuss how sustainable materials are</li> <li>consider the impact of products beyond their intended purpose</li> <li>discuss some key inventors/designers/ engineers/ chefs/manufacturers of groundbreaking products</li> </ul>
	Key Knowledge	<ul style="list-style-type: none"> <li>To understand that it is important to design clothing with the client/ target customer in mind.</li> <li>To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric.</li> <li>To understand the importance of consistently sized stitches</li> </ul>	<ul style="list-style-type: none"> <li>To know that batteries contain acid, which can be dangerous if they leak.</li> <li>To know the names of the components in a basic series circuit, including a buzzer.</li> </ul>	<ul style="list-style-type: none"> <li>To know that structures can be strengthened by manipulating materials and shapes.</li> </ul>

EYFS YEAR C Diamond		Autumn	Spring		Summer
		Structures Boats	Textiles Bookmarks	Structures Junk Modelling	Food Soup
Key Skills	Design	<ul style="list-style-type: none"> <li>• *Select appropriate resources</li> <li>• Use gestures, talking and arrangements of materials and components to show design</li> <li>• Use contexts set by the teacher and myself</li> <li>• Use language of designing and making (join, build, shape, longer, shorter, heavier etc.)</li> </ul>			
	Make	<ul style="list-style-type: none"> <li>• Construct with a purpose, using a variety of resources</li> <li>• Use simple tools and techniques</li> <li>• Build / construct with a wide range of objects</li> <li>• Select tools &amp; techniques to shape, assemble and join</li> <li>• Replicate structures with materials / components</li> <li>• Discuss how to make an activity safe and hygienic</li> <li>• Record experiences by drawing, writing, voice recording</li> <li>• Understand different media can be combined for a purpose</li> </ul>			
	Evaluate	<ul style="list-style-type: none"> <li>• Adapt work if necessary</li> <li>• Dismantle, examine, talk about existing objects/structures</li> <li>• Consider and manage some risks</li> <li>• Practise some appropriate safety measures independently</li> <li>• Talk about how things work</li> <li>• Look at similarities and differences between existing objects / materials / tools</li> <li>• Show an interest in technological toys</li> <li>• Describe textures</li> </ul>			
Key Knowledge		<ul style="list-style-type: none"> <li>• To know that 'waterproof' materials are those which do not absorb water.</li> <li>• To know that some objects float and others sink.</li> <li>• To know the different parts of a boat.</li> </ul>	<ul style="list-style-type: none"> <li>• To know that a design is a way of planning our idea before we start.</li> <li>• To know that threading is putting one material through an object.</li> </ul>	<ul style="list-style-type: none"> <li>• To know there are a range to different materials that can be used to make a model and that they are all slightly different.</li> <li>• Making simple suggestions to fix their junk model.</li> </ul>	<ul style="list-style-type: none"> <li>• Begin to understand some food preparation tools, techniques and processes</li> <li>• Practise stirring, mixing, pouring, blending</li> <li>• Discuss how to make an activity safe and hygienic</li> <li>• Discuss use of senses</li> <li>• Understand need for variety in food</li> <li>• Begin to understand that eating well contributes to good health</li> </ul>

Y1 YEAR C Emerald		Autumn	Spring	Summer
		Food Fruit and Vegetables	Textiles Puppets	Structures Constructing a Windmill
Key Skills	Design	<ul style="list-style-type: none"> <li>• have own ideas</li> <li>• explain what I want to do</li> <li>• explain what my product is for, and how it will work</li> <li>• use pictures and words to plan, begin to use models</li> <li>• design a product for myself following design criteria</li> <li>• research similar existing products</li> </ul>	<ul style="list-style-type: none"> <li>• have own ideas</li> <li>• explain what I want to do</li> <li>• explain what my product is for, and how it will work</li> <li>• use pictures and words to plan, begin to use models</li> <li>• design a product for myself following design criteria</li> <li>• research similar existing products</li> </ul>	<ul style="list-style-type: none"> <li>• have own ideas</li> <li>• explain what I want to do</li> <li>• explain what my product is for, and how it will work</li> <li>• use pictures and words to plan, begin to use models</li> <li>• design a product for myself following design criteria</li> <li>• research similar existing products</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• explain what I'm making and why consider what I need to do next</li> <li>• select tools/ equipment to cut, shape, join, finish and explain choices</li> <li>• measure, mark out, cut and shape, with support</li> <li>• choose suitable materials and explain choices</li> <li>• try to use finishing techniques to make product look good</li> <li>• work in a safe and hygienic manner</li> </ul>	<ul style="list-style-type: none"> <li>• explain what I'm making and why consider what I need to do next</li> <li>• select tools/ equipment to cut, shape, join, finish and explain choices</li> <li>• measure, mark out, cut and shape, with support</li> <li>• choose suitable materials and explain choices</li> <li>• try to use finishing techniques to make product look good</li> <li>• work in a safe and hygienic manner</li> </ul>	<ul style="list-style-type: none"> <li>• explain what I'm making and why consider what I need to do next</li> <li>• select tools/ equipment to cut, shape, join, finish and explain choices</li> <li>• measure, mark out, cut and shape, with support</li> <li>• choose suitable materials and explain choices</li> <li>• try to use finishing techniques to make product look good</li> <li>• work in a safe and hygienic manner</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• talk about my work, linking it to what I was asked to do</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used</li> <li>• talk about existing products, and say what is and isn't good</li> <li>• talk about things that other people have made</li> <li>• begin to talk about what could make product better</li> </ul>	<ul style="list-style-type: none"> <li>• talk about my work, linking it to what I was asked to do</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used</li> <li>• talk about existing products, and say what is and isn't good</li> <li>• talk about things that other people have made</li> <li>• begin to talk about what could make product better</li> </ul>	<ul style="list-style-type: none"> <li>• talk about my work, linking it to what I was asked to do</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used</li> <li>• talk about existing products, and say what is and isn't good</li> <li>• talk about things that other people have made</li> <li>• begin to talk about what could make product better</li> </ul>



Key Knowledge

- Understanding the difference between fruits and vegetables.
- To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber).
- To know that a blender is a machine which mixes ingredients together into a smooth liquid.
- To know that a fruit has seeds and a vegetable does not.
- To know that fruits grow on trees or vines.
- To know that vegetables can grow either above or below ground.
- To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).

- To know that 'joining technique' means connecting two pieces of material together.
- To know that there are various temporary methods of joining fabric by using staples, glue or pins.
- To understand that different techniques for joining materials can be used for different purposes.
- To understand that a template (or fabric pattern) is used to cut out the same shape multiple times.
- To know that drawing a design idea is useful to see how an idea will look.

- To understand that the shape of materials can be changed to improve the strength and stiffness of structures.
- To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).
- To understand that axles are used in structures and mechanisms to make parts turn in a circle.
- To begin to understand that different structures are used for different purposes.
- To know that a structure is something that has been made and put together.
- To know that materials can be manipulated to improve strength and stiffness.
- To know that a structure is something which has been formed or made from parts.
- To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.
- To know that a 'strong' structure is one which does not break easily.
- To know that a 'stiff' structure or material is one which does not bend easily.
- To know that a client is the person I am designing for.
- To know that design criteria is a list of points to ensure the product meets the clients needs and wants.
- To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity.
- To know that windmill turbines use wind to turn and make the machines inside work.
- To know that a windmill is a structure with sails that are moved by the wind.
- To know the three main parts of a windmill are the turbine, axle and structure.

Y2 YEAR C Ruby		Autumn	Spring	Summer
		Mechanisms Make a Moving Monster	Structures Baby Bear's Chair	Mechanisms Fairground Wheel
Key Skills	Design	<ul style="list-style-type: none"> <li>• have own ideas and plan what to do next</li> <li>• explain what I want to do and describe how I may do it</li> <li>• explain purpose of product, how it will work and how it will be suitable for the user</li> <li>• describe design using pictures, words, models, diagrams, begin to use ICT</li> <li>• design products for myself and others following design criteria</li> <li>• choose best tools and materials, and explain choices</li> <li>• use knowledge of existing</li> </ul>	<ul style="list-style-type: none"> <li>• have own ideas and plan what to do next</li> <li>• explain what I want to do and describe how I may do it</li> <li>• explain purpose of product, how it will work and how it will be suitable for the user</li> <li>• describe design using pictures, words, models, diagrams, begin to use ICT</li> <li>• design products for myself and others following design criteria</li> <li>• choose best tools and materials, and explain choices</li> <li>• use knowledge of existing</li> </ul>	<ul style="list-style-type: none"> <li>• have own ideas and plan what to do next</li> <li>• explain what I want to do and describe how I may do it</li> <li>• explain purpose of product, how it will work and how it will be suitable for the user</li> <li>• describe design using pictures, words, models, diagrams, begin to use ICT</li> <li>• design products for myself and others following design criteria</li> <li>• choose best tools and materials, and explain choices</li> <li>• use knowledge of existing</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• explain what I am making and why it fits the purpose</li> <li>• make suggestions as to what I need to do next.</li> <li>• join materials/components together in different ways</li> <li>• measure, mark out, cut and shape materials and components, with support.</li> <li>• describe which tools I'm using and why</li> <li>• choose suitable materials and explain choices depending on characteristics. use finishing techniques to make product look good</li> <li>• work safely and hygienically</li> </ul>	<ul style="list-style-type: none"> <li>• explain what I am making and why it fits the purpose</li> <li>• make suggestions as to what I need to do next.</li> <li>• join materials/components together in different ways</li> <li>• measure, mark out, cut and shape materials and components, with support.</li> <li>• describe which tools I'm using and why</li> <li>• choose suitable materials and explain choices depending on characteristics. use finishing techniques to make product look good</li> <li>• work safely and hygienically</li> </ul>	<ul style="list-style-type: none"> <li>• explain what I am making and why it fits the purpose</li> <li>• make suggestions as to what I need to do next.</li> <li>• join materials/components together in different ways</li> <li>• measure, mark out, cut and shape materials and components, with support.</li> <li>• describe which tools I'm using and why</li> <li>• choose suitable materials and explain choices depending on characteristics. use finishing techniques to make product look good</li> <li>• work safely and hygienically</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• describe what went well, thinking about design criteria</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion</li> <li>• evaluate how good existing products are</li> <li>• talk about what I would do differently if I were to do it again and why</li> </ul>	<ul style="list-style-type: none"> <li>• describe what went well, thinking about design criteria</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion</li> <li>• evaluate how good existing products are</li> <li>• talk about what I would do differently if I were to do it again and why</li> </ul>	<ul style="list-style-type: none"> <li>• describe what went well, thinking about design criteria</li> <li>• talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion</li> <li>• evaluate how good existing products are</li> <li>• talk about what I would do differently if I were to do it again and why</li> </ul>

Key Knowledge

- To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.
- To know that there is always an input and output in a mechanism.
- To know that an input is the energy that is used to start something working.
- To know that an output is the movement that happens as a result of the input.
- To know that a lever is something that turns on a pivot.
- To know that a linkage mechanism is made up of a series of levers.
- To know some real-life objects that contain mechanisms.

- To know that shapes and structures with wide, flat bases or legs are the most stable.
- To understand that the shape of a structure affects its strength.
- To know that materials can be manipulated to improve strength and stiffness.
- To know that a structure is something which has been formed or made from parts.
- To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.
- To know that a 'strong' structure is one which does not break easily.
- To know that a 'stiff' structure or material is one which does not bend easily.
- To know that natural structures are those found in nature.
- To know that man-made structures are those made by people.

- To know that different materials have different properties and are therefore suitable for different uses.
- To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder.
- To know that it is important to test my design as I go along so that I can solve any problems that may occur.

**Y3/4  
Opal  
YEAR C**

Autumn

**Structures**

Kapow – Constructing a Castle

Year 3

Year 4

Key Skills

Design

- begin to research others' needs
- show design meets a range of requirements
- describe purpose of product
- follow a given design criteria
- have at least one idea about how to create product
- create a plan which shows order, equipment and tools
- describe design using an accurately labelled sketch and words
- make design decisions
- explain how product will work
- make a prototype
- begin to use computers to show design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- begin to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

Make

- select suitable tools/equipment, explain choices; begin to use them accurately
- select appropriate materials, fit for purpose.
- work through plan in order
- consider how good product will be
- begin to measure, mark out, cut and shape materials/components with some accuracy
- begin to assemble, join and combine materials and components with some accuracy
- begin to apply a range of finishing techniques with some accuracy

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques with some accuracy

Evaluate

- look at design criteria while designing and making
- use design criteria to evaluate finished product
- say what I would change to make design better
- begin to evaluate existing products, considering: how well they have been made, materials, whether they work, how they have been made, fit for purpose
- begin to understand by whom, when and where products were designed
- learn about some inventors/designers/ engineers/ chefs/ manufacturers of groundbreaking products

- refer to design criteria while designing and making
- use criteria to evaluate product
- begin to explain how I could improve original design
- evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

Key Knowledge

- To understand that wide and flat based objects are more stable.
- To understand the importance of strength and stiffness in structures.

**Y3/4  
Opal  
YEAR C**

Spring

**Food**

Kapow – Eating seasonally

Year 3

Year 4

Key Skills

Design

- begin to research others' needs
- show design meets a range of requirements
- describe purpose of product
- follow a given design criteria
- have at least one idea about how to create product
- create a plan which shows order, equipment and tools
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Make

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- begin to assemble, join and combine materials and components with some accuracy
- begin to apply a range of finishing techniques with some accuracy

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
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- use criteria to evaluate product
- begin to explain how I could improve original design
- evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

Key Knowledge

- To know that not all fruits and vegetables can be grown in the UK.
- To know that climate affects food growth.
- To know that vegetables and fruit grow in certain seasons.
- To know that cooking instructions are known as a 'recipe'.
- To know that imported food is food which has been brought into the country.
- To know that exported food is food which has been sent to another country.
- To understand that imported foods travel from far away and this can negatively impact the environment.
- To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre.
- To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health.
- To know safety rules for using, storing and cleaning a knife safely.

- To know that similar coloured fruits and vegetables often have similar nutritional benefits.

**Y3/4  
Opal  
YEAR C**

**Summer**

**Textiles**

**Kapow – Cross-stitch and applique**

**Year 3**

**Year 4**

**Design**

- begin to research others' needs
- show design meets a range of requirements
- describe purpose of product
- follow a given design criteria
- have at least one idea about how to create product
- create a plan which shows order, equipment and tools
- describe design using an accurately labelled sketch and words
- make design decisions
- explain how product will work
- make a prototype
- begin to use computers to show design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- begin to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

**Make**

- select suitable tools/equipment, explain choices; begin to use them accurately
- select appropriate materials, fit for purpose.
- work through plan in order
- consider how good product will be
- begin to measure, mark out, cut and shape materials/components with some accuracy
- begin to assemble, join and combine materials and components with some accuracy
- begin to apply a range of finishing techniques with some accuracy

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques with some accuracy

**Evaluate**

- look at design criteria while designing and making
- use design criteria to evaluate finished product
- say what I would change to make design better
- begin to evaluate existing products, considering: how well they have been made, materials, whether they work, how they have been made, fit for purpose
- begin to understand by whom, when and where products were designed
- learn about some inventors/designers/ engineers/ chefs/ manufacturers of groundbreaking products

- refer to design criteria while designing and making
- use criteria to evaluate product
- begin to explain how I could improve original design
- evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

**Key  
Knowledge**

- To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces.
- To know that when two edges of fabric have been joined together it is called a seam.
- To know that it is important to leave space on the fabric for the seam.
- To understand that some products are turned inside out after sewing so the stitching is hidden.

Key Skills

**Y4/5  
Topaz  
YEAR C**

Autumn

**Textiles**

Kapow – Cross-stitch and applique

Year 4

Year 5

Key Skills

Design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

- use internet and questionnaires for research and design ideas \*take a user's view into account when designing
- begin to consider needs/wants of individuals/groups when designing and ensure product is fit for purpose
- create own design criteria
- have a range of ideas
- produce a logical, realistic plan and explain it to others.
- use cross-sectional planning and annotated sketches
- make design decisions considering time and resources.
- clearly explain how parts of product will work.
- model and refine design ideas by making prototypes and using pattern pieces.
- use computer-aided designs

Make

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques with some accuracy

- use selected tools/equipment with good level of precision
- produce suitable lists of tools, equipment/materials needed
- select appropriate materials, fit for purpose; explain choices, considering functionality
- create and follow detailed stepby-step plan
- explain how product will appeal to an audience
- mainly accurately measure, mark out, cut and shape materials/components
- mainly accurately assemble, join and combine materials/components
- mainly accurately apply a range of finishing techniques
- use techniques that involve a small number of steps
- begin to be resourceful with practical problems

Evaluate

- refer to design criteria while designing and making
- use criteria to evaluate product
- begin to explain how I could improve original design \*evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

- evaluate quality of design while designing and making
- evaluate ideas and finished product against specification, considering purpose and appearance.
- test and evaluate final product
- evaluate and discuss existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- begin to evaluate how much products cost to make and how innovative they are
- research how sustainable materials are
- talk about some key inventors/designers/ engineers/ chefs/manufacturers of groundbreaking products



Key  
Knowledge

- To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces.
- To know that when two edges of fabric have been joined together it is called a seam.
- To know that it is important to leave space on the fabric for the seam.
- To understand that some products are turned inside out after sewing so the stitching is hidden.

**Y4/5  
Topaz  
YEAR C**

Spring

**Structures**

Kapow – Constructing a Castle

Year 4

Year 5

Key Skills

Design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

- use internet and questionnaires for research and design ideas \*take a user's view into account when designing
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- have a range of ideas
- produce a logical, realistic plan and explain it to others.
- use cross-sectional planning and annotated sketches
- make design decisions considering time and resources.
- clearly explain how parts of product will work.
- model and refine design ideas by making prototypes and using pattern pieces.
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Make

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques with some accuracy

- use selected tools/equipment with good level of precision
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- mainly accurately apply a range of finishing techniques
- use techniques that involve a small number of steps
- begin to be resourceful with practical problems

Evaluate

- refer to design criteria while designing and making
- use criteria to evaluate product
- begin to explain how I could improve original design
- evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

- evaluate quality of design while designing and making
- evaluate ideas and finished product against specification, considering purpose and appearance.
- test and evaluate final product
- evaluate and discuss existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- begin to evaluate how much products cost to make and how innovative they are
- research how sustainable materials are
- talk about some key inventors/designers/ engineers/ chefs/manufacturers of groundbreaking products

Key  
Knowledge

- To understand that wide and flat based objects are more stable.
- To understand the importance of strength and stiffness in structures.

**Y4/5  
Topaz  
YEAR C**

Summer

**Food**

Kapow – Eating seasonally

Year 4

Year 5

Key Skills

Design

- use research for design ideas
- show design meets a range of requirements and is fit for purpose
- to create own design criteria
- have at least one idea about how to create product and suggest improvements for design.
- produce a plan and explain it to others
- say how realistic plan is.
- include an annotated sketch
- make and explain design decisions considering availability of resources
- explain how product will work
- make a prototype

- use internet and questionnaires for research and design ideas \*take a user's view into account when designing
- begin to consider needs/wants of individuals/groups when designing and ensure product is fit for purpose
- create own design criteria
- have a range of ideas
- produce a logical, realistic plan and explain it to others.
- use cross-sectional planning and annotated sketches
- make design decisions considering time and resources.
- clearly explain how parts of product will work.
- model and refine design ideas by making prototypes and using pattern pieces.
- use computer-aided designs

Make

- select suitable tools and equipment, explain choices in relation to required techniques and use accurately
- select appropriate materials, fit for purpose; explain choices
- work through plan in order.
- realise if product is going to be good quality
- measure, mark out, cut and shape materials/components with some accuracy
- assemble, join and combine materials and components with some accuracy
- apply a range of finishing techniques with some accuracy

- use selected tools/equipment with good level of precision
- produce suitable lists of tools, equipment/materials needed
- select appropriate materials, fit for purpose; explain choices, considering functionality
- create and follow detailed step-by-step plan
- explain how product will appeal to an audience
- mainly accurately measure, mark out, cut and shape materials/components
- mainly accurately assemble, join and combine materials/components
- mainly accurately apply a range of finishing techniques
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Evaluate

- refer to design criteria while designing and making
- use criteria to evaluate product
- begin to explain how I could improve original design
- evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- discuss by whom, when and where products were designed
- research whether products can be recycled or reused
- know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products

- evaluate quality of design while designing and making
- evaluate ideas and finished product against specification, considering purpose and appearance.
- test and evaluate final product
- evaluate and discuss existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose
- begin to evaluate how much products cost to make and how innovative they are
- research how sustainable materials are
- talk about some key inventors/designers/ engineers/ chefs/manufacturers of groundbreaking products

## Key Knowledge

- To know that not all fruits and vegetables can be grown in the UK.
- To know that climate affects food growth.
- To know that vegetables and fruit grow in certain seasons.
- To know that cooking instructions are known as a 'recipe'.
- To know that imported food is food which has been brought into the country.
- To know that exported food is food which has been sent to another country.
- To understand that imported foods travel from far away and this can negatively impact the environment.
- To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre.
- To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health.
- To know safety rules for using, storing and cleaning a knife safely.
- To know that similar coloured fruits and vegetables often have similar nutritional benefits.

<b>Y6</b>	<b>Autumn</b>		<b>Spring</b>		<b>Summer</b>	
	<b>Textiles</b>		<b>Electrical Systems</b>		<b>Structures</b>	
<b>YEAR C</b>	Kapow- Waistcoats		Kapow – Steady hand game		Kapow - Playgrounds	
<b>Onyx</b>	Kapow- Waistcoats		Kapow – Steady hand game		Kapow - Playgrounds	
<b>Key Skills</b>	<b>Design</b>	<ul style="list-style-type: none"> <li>draw on market research to inform design</li> <li>use research of user's individual needs, wants, requirements for design</li> <li>identify features of design that will appeal to the intended user</li> <li>create own design criteria and specification</li> <li>come up with innovative design ideas</li> <li>follow and refine a logical plan.</li> <li>use annotated sketches, crosssectional planning and exploded diagrams</li> <li>make design decisions, considering, resources and cost</li> <li>clearly explain how parts of design will work, and how they are fit for purpose</li> <li>independently model and refine design ideas by making prototypes and using pattern pieces</li> <li>use computer-aided designs</li> </ul>	<ul style="list-style-type: none"> <li>draw on market research to inform design</li> <li>use research of user's individual needs, wants, requirements for design</li> <li>identify features of design that will appeal to the intended user</li> <li>create own design criteria and specification</li> <li>come up with innovative design ideas</li> <li>follow and refine a logical plan.</li> <li>use annotated sketches, crosssectional planning and exploded diagrams</li> <li>make design decisions, considering, resources and cost</li> <li>clearly explain how parts of design will work, and how they are fit for purpose</li> <li>independently model and refine design ideas by making prototypes and using pattern pieces</li> <li>use computer-aided designs</li> </ul>	<ul style="list-style-type: none"> <li>draw on market research to inform design</li> <li>use research of user's individual needs, wants, requirements for design</li> <li>identify features of design that will appeal to the intended user</li> <li>create own design criteria and specification</li> <li>come up with innovative design ideas</li> <li>follow and refine a logical plan.</li> <li>use annotated sketches, crosssectional planning and exploded diagrams</li> <li>make design decisions, considering, resources and cost</li> <li>clearly explain how parts of design will work, and how they are fit for purpose</li> <li>independently model and refine design ideas by making prototypes and using pattern pieces</li> <li>use computer-aided designs</li> </ul>		
	<b>Make</b>	<ul style="list-style-type: none"> <li>use selected tools and equipment precisely</li> <li>produce suitable lists of tools, equipment, materials needed, considering constraints</li> <li>select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics</li> <li>create, follow, and adapt detailed step-by-step plans</li> <li>explain how product will appeal to audience; make changes to improve quality</li> <li>accurately measure, mark out, cut and shape materials/components</li> <li>accurately assemble, join and combine materials/components</li> </ul>	<ul style="list-style-type: none"> <li>use selected tools and equipment precisely</li> <li>produce suitable lists of tools, equipment, materials needed, considering constraints</li> <li>select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics</li> <li>create, follow, and adapt detailed step-by-step plans</li> <li>explain how product will appeal to audience; make changes to improve quality</li> <li>accurately measure, mark out, cut and shape materials/components</li> <li>accurately assemble, join and combine materials/components</li> </ul>	<ul style="list-style-type: none"> <li>use selected tools and equipment precisely</li> <li>produce suitable lists of tools, equipment, materials needed, considering constraints</li> <li>select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics</li> <li>create, follow, and adapt detailed step-by-step plans</li> <li>explain how product will appeal to audience; make changes to improve quality</li> <li>accurately measure, mark out, cut and shape materials/components</li> <li>accurately assemble, join and combine materials/components</li> <li>accurately apply a range of finishing techniques</li> </ul>		

		<ul style="list-style-type: none"> <li>accurately apply a range of finishing techniques</li> <li>use techniques that involve a number of steps</li> <li>be resourceful with practical problems</li> </ul>	<ul style="list-style-type: none"> <li>accurately apply a range of finishing techniques</li> <li>use techniques that involve a number of steps</li> <li>be resourceful with practical problems</li> </ul>	<ul style="list-style-type: none"> <li>use techniques that involve a number of steps</li> <li>be resourceful with practical problems</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>evaluate quality of design while designing and making; is it fit for purpose?</li> <li>keep checking design is best it can be.</li> <li>evaluate ideas and finished product against specification, stating if it's fit for purpose</li> <li>test and evaluate final product; explain what would improve it and the effect different resources may have had</li> <li>do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose</li> <li>evaluate how much products cost to make and how innovative they are</li> <li>research and discuss how sustainable materials are</li> <li>consider the impact of products beyond their intended purpose</li> <li>discuss some key inventors/designers/engineers/ chefs/manufacturers of groundbreaking products</li> </ul>	<ul style="list-style-type: none"> <li>evaluate quality of design while designing and making; is it fit for purpose?</li> <li>keep checking design is best it can be.</li> <li>evaluate ideas and finished product against specification, stating if it's fit for purpose</li> <li>test and evaluate final product; explain what would improve it and the effect different resources may have had</li> <li>do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose</li> <li>evaluate how much products cost to make and how innovative they are</li> <li>research and discuss how sustainable materials are</li> <li>consider the impact of products beyond their intended purpose</li> <li>discuss some key inventors/designers/engineers/ chefs/manufacturers of groundbreaking products</li> </ul>	<ul style="list-style-type: none"> <li>evaluate quality of design while designing and making; is it fit for purpose?</li> <li>keep checking design is best it can be.</li> <li>evaluate ideas and finished product against specification, stating if it's fit for purpose</li> <li>test and evaluate final product; explain what would improve it and the effect different resources may have had</li> <li>do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose</li> <li>evaluate how much products cost to make and how innovative they are</li> <li>research and discuss how sustainable materials are</li> <li>consider the impact of products beyond their intended purpose</li> <li>discuss some key inventors/designers/engineers/ chefs/manufacturers of groundbreaking products</li> </ul>
	Key Knowledge	<ul style="list-style-type: none"> <li>To understand that it is important to design clothing with the client/ target customer in mind.</li> <li>To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric.</li> <li>To understand the importance of consistently sized stitches</li> </ul>	<ul style="list-style-type: none"> <li>To know that batteries contain acid, which can be dangerous if they leak.</li> <li>To know the names of the components in a basic series circuit, including a buzzer.</li> </ul>	<ul style="list-style-type: none"> <li>To know that structures can be strengthened by manipulating materials and shapes.</li> </ul>