Kingsley Community Primary & Nursery School

Curriculum Overview Subject: Design & Technology

Intent

By the end of Key Stage 2, pupils should have the knowledge, understanding and skills to be able to design and make products that solve real and relevant problems. When doing so, pupils should learn how to take risks, resulting in them becoming resourceful, creative, innovative and enterprising citizens, enriching our future society. With regards to cooking and nutrition, by the end of Key Stage 2 pupils should be able to prepare and cook a variety of dishes using a range of cooking techniques. In addition, they should have a secure understanding of a healthy and varied diet, and know where and how their ingredients are grown, reared, caught and processed. Teachers will also endeavour to instil a love of cooking, which will in turn enable pupils to passionately develop a crucial life skill.

Implementation

At Kingsley, each Design and Technology topic (excluding cooking and nutrition) will be broken into 3 parts:

- **DESIGN** (approximately 1 lesson)
- **MAKE** (approximately 2-3 lessons)
- **EVALUATE** (approximately 1 lesson)

TECHNICAL KNOWLEDGE will be intertwined into each lesson.

During the design process, teachers will ensure that ***design criteria*** is made clear to pupils (e.g. 1. Must have at least one moving part 2. Must be waterproof) to direct pupils' focus and to ensure that purposeful, functional and appealing products are designed. Additionally, although time to evaluate their design will be allocated to the end of their project, teachers will also be aware of the ***iterative*** nature of designing and making (as stated in the National Curriculum) so will encourage pupils to continuously evaluate and consequently amend their design throughout the making process (if necessary).

COOKING AND NUTRITION should be allocated approximately 2 - 3 lessons per topic.

To accommodate the above, design and technology will be taught in the following way:

AUTUMN 2	Moving mechanism unit	4 – 5 lessons following 3 step process
SPRING 2	Cooking and nutrition Textiles (KS2 only)	2 – 3 lessons 2 lessons
SUMMER 2	Whole school D&T project	4 – 5 lessons following 3 step process

Impact

At Kingsley, our Design and Technology curriculum is taught through a 3 step process, design, make and evaluate, which will be recorded within individual scrapbooks. Consequently, when carrying out 'book-looks' of the children's scrapbooks, teachers will be able to see if progress has been made not only in their ability to create a purposeful final piece, but also in the design and evaluation process. In addition, formative assessment techniques such as appropriate questioning and discussions with the children will be carried out by both the class teacher and the Design and Technology lead.

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	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

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Curriculum Objectives /Knowledge	*Manipulates materials to achieve a planned effect. • Construct with a purpose in mind, using a variety of resources. • Uses simple tools and techniques competently and appropriately. • Select appropriate resources and adapts work where necessary. • Select tools and techniques needed to shape, assemble and join materials they are using.	Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment]. When designing and making, pupils should be taught to: **Design** *design purposeful, functional, appealing products for themselves and other users based on design criteria. *generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. **Make** *select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]. *select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. **Evaluate** *explore and evaluate a range of existing products.	Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment]. When designing and making, pupils should be taught to: **Design** *use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups. *generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. **Make** *select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately. *select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. **Evaluate** *investigate and analyse a range of existing products. *evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. *understand how key events and individuals in design and technology have helped shape the world. **Technical knowledge** *apply their understanding of how to strengthen, stiffen and reinforce more complex structures. *understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]. *understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].

		*evaluate their ideas and products against design criteria. **Technical knowledge** *build structures, exploring how they can be made stronger, stiffer and more stable. *explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. **Cooking and Nutrition** Pupils should be taught to: *use the basic principles of a healthy and varied diet to prepare dishes. *understand where food comes from.	*apply their understanding of computing to program, monitor and control their products. **Cooking and Nutrition** *understand and apply the principles of a healthy and varied diet *prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. *understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

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Subject Skills: **DESIGN**	**Designing and communicating ideas:** *begin to use the language of designing and making, e.g. join, build and shape. *learn about planning and adapting initial ideas to make them better.	**Understanding contexts, users and purposes:** *work within different contexts, such as imaginary, story-based, home, school, gardens, playgrounds and the local community. *state what products they are designing and making. *describe what their products are for. *say how their products will work. *use basic design criteria to help develop their ideas.	**Understanding contexts, users and purposes:** *work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment. *state what products they are designing and making. *say whether their products are for themselves or other users. *describe what their products are for. *say how their products will work. *say how they will make their products suitable for their intended users.	**Understanding contexts, users and purposes:** *work within a range of contexts, such as the home, school, and the wider environment. *describe the purpose of their products. *indicate the design features of their products. *explain how parts of their products work. *gather information about the needs and wants of others. *develop their own design criteria.	**Understanding contexts, users and purposes:** *work within a range of contexts, such as the home, school, and the wider environment. *describe the purpose of their products. *indicate the design features of their products. *explain how parts of their products work. *gather information about the needs and wants of particular individuals and groups. *develop their own design criteria and use these to inform their ideas.	**Understanding contexts, users and purposes:** *work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment. *describe the purpose of their products. *indicate the design features of their products that will appeal to intended users. *explain how particular parts of their products work. *identify the needs, wants, preferences and values of particular individuals and groups.	**Understanding contexts, users and purposes:** *work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment. *describe the purpose of their products. *indicate the design features of their products that will appeal to intended users. *explain how particular parts of their products work. *carry out research, using surveys, interviews, questionnaires and web-based resources.

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		Generating, developing, modelling and communicating ideas: *use knowledge of existing products to help come up with ideas. *develop and communicate ideas by talking. *model ideas by exploring materials, components and construction kits. *use information and communication technology, where appropriate, to develop their ideas.	*use simple design criteria to help develop their ideas. **Generating, developing, modelling and communicating ideas:** *generate ideas by drawing on their own experiences. *use knowledge of existing products to help come up with ideas. *develop and communicate ideas by talking and drawing. *model ideas by exploring materials, components and construction kits and by making templates and mock- ups. *use information and communication technology, where appropriate, to develop and communicate their ideas.	**Generating, developing, modelling and communicating ideas:** *share and clarify ideas through discussion. *model their ideas using prototypes. *use annotated sketches to communicate their ideas. *generate realistic ideas, focusing on the needs of the user.	**Generating, developing, modelling and communicating ideas:** *share and clarify ideas through discussion. *model their ideas using prototypes. *use annotated sketches to develop and communicate their ideas. *make design decisions that take account of the availability of resources.	**Generating, developing, modelling and communicating ideas:** *model their ideas using prototypes and pattern pieces. *use annotated sketches and cross-sectional drawings to develop and communicate their ideas. *use computer-aided design to develop and communicate their ideas. *generate innovative ideas, drawing on research. *make design decisions, taking account of constraints such as time and resources.	**Generating, developing, modelling and communicating ideas:** *model their ideas using prototypes and pattern pieces. *use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas. *use computer-aided design to develop and communicate their ideas. *generate innovative ideas, drawing on research. *make design decisions, taking account of constraints such as time, resources and cost.

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Subject Skills: **MAKE**	**Making:** *follow procedures for safety and hygiene. *learn to construct with a purpose in mind. *select tools and techniques needed to shape, assemble and join materials.	**Planning:** *plan by suggesting what to do next. *select from some tools and equipment. *select from some materials and components according to their characteristics.	**Planning:** *plan by suggesting what to do next. *select from a range of tools and equipment, explaining their choices. *select from a range of materials and components according to their characteristics.	**Planning:** *select tools and equipment suitable for the task. *explain their choice of tools and equipment. *select materials and components. *order the main stages of making.	**Planning:** *select tools and equipment suitable for the task. *explain their choice of tools and equipment. *select materials and components. *order the main stages of making.	**Planning:** *select tools and equipment suitable for the task. *explain their choice of tools and equipment in relation to the skills and techniques they will be using. *select materials and components suitable for the task. *explain their choice of materials and components according to functional properties.. *produce appropriate lists of tools, equipment and materials that they need.	**Planning:** *select tools and equipment suitable for the task. *explain their choice of tools and equipment in relation to the skills and techniques they will be using. *select materials and components suitable for the task. *explain their choice of materials and components according to functional properties and aesthetic qualities. *formulate step-by-step plans as a guide to making.

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		Practical skills and techniques: *follow procedures for safety and hygiene. *use a range of materials and components, including construction materials and kits, food ingredients and mechanical components. * mark out, cut and shape materials and components. *assemble, join and combine materials and components. *use simple finishing techniques, including those from art and design.	**Practical skills and techniques:** *follow procedures for safety and hygiene. *use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components. *measure, mark out, cut and shape materials and components. *assemble, join and combine materials and components. *use finishing techniques, including those from art and design.	**Practical skills and techniques:** *follow procedures for safety and hygiene. *use a wider range of materials and components, including construction materials and kits, food ingredients and mechanical components. *measure, mark out, cut and shape materials and components with some accuracy. *assemble, join and combine materials and components with some accuracy. *apply a range of finishing techniques, including those from art and design, with some accuracy.	**Practical skills and techniques:** *follow procedures for safety and hygiene. *use a wider range of materials and components, including construction materials and kits, food ingredients and mechanical components. *measure, mark out, cut and shape materials and components with some accuracy. *assemble, join and combine materials and components with some accuracy. *apply a range of finishing techniques, including those from art and design, with some accuracy.	**Practical skills and techniques:** *follow procedures for safety and hygiene. *use a wider range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components. *accurately measure, mark out, cut and shape materials and components. *accurately assemble, join and combine materials and components. *accurately apply a range of finishing techniques, including those from art and design.	**Practical skills and techniques:** *follow procedures for safety and hygiene. *use a wider range of materials and components, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components. *accurately measure, mark out, cut and shape materials and components. *accurately assemble, join and combine materials and components. *accurately apply a range of finishing techniques, including those from art and design. *use multi-step techniques.

							*demonstrate resourcefulness when tackling practical problems.

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Subject Skills: EVALUATE	**Own ideas and products:** *talk about their design ideas and what they are making. *begin to talk about changes made during the making process, e.g. making a decision to use a different joining method.	**Own ideas and products:** *talk about their design ideas and what they are making. *talk about changes made during the making process, e.g. making a decision to use a different joining method.	**Own ideas and products:** *talk about their design ideas and what they are making. *make simple judgements about their products and ideas against design criteria.	**Own ideas and products:** *identify the strengths and areas for development in their ideas and products. *refer to their design criteria as they design and make. *use their design criteria to evaluate their completed products. **Key events and individuals:** Pupils should know: • about inventors, designers and manufacturers who have developed ground-breaking products.	**Own ideas and products:** *identify the strengths and areas for development in their ideas and products. *refer to their design criteria as they design and make. *use their design criteria to evaluate their completed products. **Key events and individuals:** Pupils should know: • about inventors, designers and manufacturers who have developed ground-breaking products.	**Own ideas and products:** *identify the strengths and areas for development in their ideas and products. *consider the views of others, including intended users, to improve their work. *evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make. *evaluate the ideas and products against their original design specification. **Key events and individuals:** Pupils should know: • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products	**Own ideas and products:** *identify the strengths and areas for development in their ideas and products. *consider the views of others, including intended users, to improve their work. *critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make. *evaluate the ideas and products against their original design specification. **Key events and individuals:** Pupils should know: • about inventors, designers, engineers, chefs and manufacturers who have developed

		Existing products: Pupils should explore: • what products are • who products are for • what products are for • how products work • how products are used • what materials products are made from • what they like and dislike about products.	**Existing products:** Pupils should explore: • what products are • who products are for • what products are for • how products work • how products are used • where products might be used • what materials products are made from • what they like and dislike about products.	**Existing products:** Pupils should investigate and analyse: • how well products have been designed • how well products have been made • why materials have been chosen • how well products work. • who designed and made the products • where products were designed and made • when products were designed and made.	**Existing products:** Pupils should investigate and analyse: • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work. • who designed and made the products • where products were designed and made • when products were designed and made • whether products can be recycled or reused	**Existing products:** Pupils should investigate and analyse: • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes. • how innovative products are • how sustainable the materials in products are. .	ground- breaking products. **Existing products:** Pupils should investigate and analyse: • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants. • how much products cost to make • how innovative products are • how sustainable the materials in products are • what impact products have beyond their intended purpose.

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Subject Skills: TECHNICAL KNOWLEDGE	**Making products work:** Pupils should know: *about the movement of simple mechanisms such as **pop-ups**. *how to use a range of tools, e.g. scissors, hole punch, stapler, rolling pins and pastry cutters. *how everyday objects work by dismantling things.	**Making products work:** Pupils should know: *about the movement of simple mechanisms such as **levers** and **sliders**. *about the simple working characteristics of materials and components *how freestanding structures can be made stronger, stiffer and more stable. *that food ingredients should be combined according to their sensory characteristics. *the correct technical vocabulary for the projects they are undertaking.	**Making products work:** Pupils should know: *about the movement of simple mechanisms such as **wheels** and **axles**. *about the simple working characteristics of materials and components *how freestanding structures can be made stronger, stiffer and more stable. *that food ingredients should be combined according to their sensory characteristics. *the correct technical vocabulary for the projects they are undertaking.	**Making products work:** Pupils should know: *how mechanical systems such as **cams** and **linkages**. *how to use learning from science to help design and make products that work. *how to use learning from mathematics to help design and make products that work *that materials have both functional properties. *the correct technical vocabulary for the projects they are undertaking. *how to make strong, stiff shell structures. *that a 3-D textiles product can be assembled from two identical fabric shapes.	**Making products work:** Pupils should know: *how mechanical systems such as **pulleys** to create movement. *how to use learning from science to help design and make products that work. *how to use learning from mathematics to help design and make products that work *that materials have both functional properties. *the correct technical vocabulary for the projects they are undertaking. *how simple electrical circuits and components can be used to create functional products.	**Making products work:** Pupils should know: *how mechanical systems such as **pneumatics** to create movement. *how to use learning from science to help design and make products that work. *how to use learning from mathematics to help design and make products that work *that materials have both functional properties and aesthetic qualities. *that materials can be combined and mixed to create more useful characteristics. *that mechanical and electrical systems have an input, process and output. *the correct technical vocabulary for the	**Making products work:** Pupils should know: *how mechanical systems such as **gears** to create movement. *how to use learning from science to help design and make products that work. *how to use learning from mathematics to help design and make products that work *that materials have both functional properties and aesthetic qualities. *that materials can be combined and mixed to create more useful characteristics. *that mechanical and electrical systems have an input, process and output. *the correct technical vocabulary for the

				*that food ingredients can be fresh, pre-cooked and processed.	*how to program a computer to control their products. *how to make strong, stiff shell structures. *that a single fabric shape can be used to make a 3D textiles product. *that food ingredients can be fresh, pre-cooked and processed.	projects they are undertaking. *how electrical circuits and components can be used to create functional products. *how to program a computer to monitor changes in the environment and control their products. *how to reinforce and strengthen a 3D framework. *that a 3D textiles product can be made from a combination of fabric shapes *that a recipe can be adapted by adding one or more ingredients.	projects they are undertaking. *how more complex electrical circuits and components can be used to create functional products. *how to program a computer to monitor changes in the environment and control their products. *how to reinforce and strengthen a 3D framework. *that a 3D textiles product can be made from a combination of fabric shapes *that a recipe can be adapted by adding or substituting one or more ingredients.

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Subject Skills: **COOKING & NUTRITION**	Pupils should: *begin to understand some of the tools, techniques and processes involved in food preparation. *have basic hygiene awareness. *understand that food comes from plants or animals.	**Where food comes from:** Pupils should know: *that food comes from plants or animals. *that food has to be farmed, grown elsewhere or caught.	**Where food comes from:** Pupils should know: *that all food comes from plants or animals. *that food has to be farmed, grown elsewhere or caught.	**Where food comes from:** Pupils should know: *that a recipe can be adapted a by adding ingredients. *that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world.	**Where food comes from:** *that a recipe can be adapted a by adding ingredients. *that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world.	**Where food comes from:** *that a recipe can be adapted a by adding or substituting one or more ingredients *that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world. *that seasons may affect the food available.	**Where food comes from:** *that a recipe can be adapted a by adding or substituting one or more ingredients. *that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world. *that seasons may affect the food available. *how food is processed into ingredients that can be eaten or used in cooking.

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		Food preparation, cooking and nutrition: Pupils should know: *how to name and sort foods. *that everyone should eat at least five portions of fruit and vegetables every day. *how to prepare simple dishes safely and hygienically, without using a heat source. *how to use techniques such as cutting.	**Food preparation, cooking and nutrition:** Pupils should know: *how to name and sort foods into the five groups in the Eatwell Guide. *that everyone should eat at least five portions of fruit and vegetables every day. *how to prepare simple dishes safely and hygienically, without using a heat source. *how to use techniques such as cutting, peeling and grating.	**Food preparation, cooking and nutrition:** Pupils should know: *how to prepare and cook predominantly savoury dishes safely and hygienically. *how to use a range of techniques such as peeling, chopping, grating, mixing, kneading and baking. *that a healthy diet is made up from a variety and balance of different food and drink, as depicted in the Eatwell Guide. *that to be active and healthy, food and drink are needed to provide energy for the body.	**Food preparation, cooking and nutrition:** Pupils should know: *how to prepare and cook predominantly savoury dishes safely and hygienically. *how to use a range of techniques such as peeling, chopping, grating, mixing, kneading and baking. *that a healthy diet is made up from a variety and balance of different food and drink, as depicted in the Eatwell Guide. *that to be active and healthy, food and drink are needed to provide energy for the body.	**Food preparation, cooking and nutrition:** Pupils should know: *how to prepare and cook predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source. *how to use a range of techniques such as peeling, chopping, grating, mixing, spreading, kneading and baking. *that recipes can be adapted to change the appearance, taste and texture. *that different food and drink contain different substances – nutrients, water and fibre – that are needed for health.	**Food preparation, cooking and nutrition:** Pupils should know: *how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source. *how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking. *that recipes can be adapted to change the appearance, taste, texture and aroma. *that different food and drink contain different substances – nutrients, water and fibre – that are needed for health.

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Vocabulary: DESIGN & TECHNOLOGY	• designing • making • hygiene • tools • joining • material • pop-ups	• designing • making • materials • equipment • hygiene • tools • construction • joining • levers • sliders	• designing • making • materials • equipment • hygiene • tools • construction • joining • wheels • axles	• designing • making • materials • equipment • hygiene • tools • construction • joining • design criteria • prototypes • components • assemble • accuracy • structures • cams and linkages	• designing • making • materials • equipment • hygiene • tools • construction • joining • design criteria • prototypes • components • assemble • accuracy • structures • pulleys	• designing • making • materials • equipment • hygiene • tools • construction • joining • design criteria • prototypes • components • assemble • accuracy • structures • annotations • sketches • innovative • constraints • electrical systems • pneumatics	• designing • making • materials • equipment • hygiene • tools • construction • joining • design criteria • prototypes • components • assemble • accuracy • structures • annotations • sketches • innovative • constraints • electrical systems • gears

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<u>Vocabulary:</u> **COOKING & NUTRITION**	• cutting • farmed • grown	• cutting • farmed • grown	• food groups • portions • cutting • peeling • grating	• active • grown • reared • caught • diet • balanced • peeling • chopping • grating • mixing • kneading • baking	• active • grown • reared • caught • diet • balanced • peeling • chopping • grating • mixing • kneading • baking	• substituting • seasonal • active • grown • reared • caught • diet • balanced • peeling • chopping • grating • mixing • kneading • baking	• processed • fibre • aroma • nutrients • substituting • seasonal • active • grown • reared • caught • diet • balanced • peeling • chopping • grating • mixing • kneading • baking

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Activities / Enhancements	Whole school art project. **Pop-ups** Pop-up cards or stories using 1-3 different pop-up methods (e.g. opening mouths, double cut technique leading to continuous double cut technique for HA, folding strips technique).	Whole school art project. **Levers** Rhymes, stories or poems that have a character (animal or human) which move their legs or other body part using a split-pin lever design. **Sliders** Lollipop stick sliders (e.g. of animals, rockets, aliens, people etc).	Whole school art project. **Wheels and axels** Moving vehicles using wheels and axles (e.g. cars, buses, land yachts). These could be decorated using various art and design techniques and later be raced to incorporate maths skills.	Whole school art project. **Cams** Character that moves up and down using the following cam method: • eccentric cam • pear cam • snail cam • oval cam **Linkages** Dragon or animal that opens and closes its mouth using a split-pin linkage design.	Whole school art project. **Pulley systems** Travelling object or character using a bobbin and string pulley system. This can be a horizontal technique using 2 pulleys (e.g. a picnic basket moving from a house to a lighthouse to represent the 'Lighthouse Keeper's Lunch') or a vertical pulley (e.g. a mother bird lowering down to feed her chicks in the nest).	Whole school art project. **Pneumatics** Using 2 syringes and tubing, a design can open and close (e.g. a house door, an animal or monster's mouth, a treasure chest etc.). To extend this, a syringe can be connected to an alternative object (e.g. balloon, party horn etc.).	Whole school art project. **Gears and controls** Gear and controls can be made using a battery motor, coils and a paperclip and split-pin switch. These can be used to power a variety of made designs, such as miniature fairground rides. To extend this, an electrical circuit could be created to provide light or noise.

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