Curriculum Knowledge Overview: Design Technology

Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
R	***'Settling in'*** **'All about me'** **Megaboy** **Once there Giants** **Funnybones**	***'Toys'*** **A Chair for Baby Bear** **Nobot Robot** **T'was the Night Before Christmas**	***Traditional Stories*** **A year on Adam's Farm** **The Three Little Pigs** **Three Billy Goats Gruff**	***Contemporary stories*** **The Man on the Moon; a Day in the life of Bob Gruffalo** **Tree: Seasons Come, Seasons Go**	***Mini-beasts*** **The Very Hungry Caterpillar** **The Tiny Seed** **What the Ladybird Heard**	***The World*** **Handa's Surprise** **Atlases** **Bringing the Rain to Kapiti Plain** **Mama Panya's Pancake**
	Beginning to think like designers (SKILLS) • Discuss and think about what they want to construct • Explore and choose materials for a purpose thinking about their properties • Problem solving refining - Discuss problems and how they might be solved as they arise. • Resilience - return to and build on their previous learning, refining ideas and developing their ability to represent them. • Evaluate/Reflect with children on how they have achieved their aims. • Explore and use a variety of joining techniques including adhesive tape, glues and pins and staplers • Explore and use a variety of tools safely. Handle tools, objects, construction and malleable materials safely and with increasing control. Develop scissors skills to cut • Collaboration - create collaboratively, sharing ideas, resources and skills.					
	Enhanced Learning: • **The Workshop –junk modelling & design boards, various construction toys & kits, range of tools for cutting, marking and joining, malleable materials, Outdoor builders yard with large construction, crates, pipes and bricks.** • **Outdoor 'Builder's Yard' – Large scale design and building with a range of tools, crates, bricks, guttering, pipes, planks, sand, rope**					
	EYFS Statutory Framework **Exploring and using media and materials:** **Children sing songs, make music and dance, and experiment with ways of changing them. They safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.** **Being imaginative:** **Children use what they have learnt about media and materials in original ways, thinking about uses and purposes. They represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role-play and stories.**					
	Adult Led Learning: **Food – All About Me** • **To explore and discuss healthy food choices and to know which foods are good for our growing bodies.** • **To learn about good hand hygiene to stay healthy.** • **Explore and use tools to peel and chop.**	**Adult Led Learning:** **Mechanisms – Christmas** • **Explore and discuss the mechanisms involved in toys they play with and think about how they work.** • **To design and make Santa Sliders (levers)** **Structures - create and adapt structures to make ramps for toy cars outside.**	**Adult Led Learning:** **Food – Adam's Farm** • **Learn to follow a recipe using seasonal food.** **Textiles – 3 Billy Goat's Gruff** **Experiment with different materials and joins.** **Investigate the best way to join their material to their egg.**	**Adult Led Learning:** **Structures – A Day in the Life of Bob** **Investigate, design and make boats, thinking about the shape and materials required to float.** **Textiles – Gruffalo** **choosing, cutting and joining materials to create clothes for the characters.**	**Adult Led Learning:** **Structures – Very Hungry Caterpillar creating a minibeast habitat which stands up**	**Adult Led Learning:** **Textiles – choosing materials suitable to make shelters for the different types of weather in the stories.**
	Vocabulary: **fruits, vegetables, healthy, peel, chop, knife, peeler, wash, dry, hygiene, clean, safely**	**Vocabulary:** **mechanism, slider, stick, join, purpose, high, higher, highest, low, lower, lowest, material, smooth, adapt, change, slope, slide, roll**	**Vocabulary:** **recipe, seasonal, instructions, measure, ingredients, utensils, weigh, hygiene, cook, oven, hob, mix, stir** **material(s), join, cut, scrunch, sew, glue, stick, staple, pin, safely**	**Vocabulary:** **investigate, find out, design, waterproof, absorbent, float, sink, sail, heavy, light, plastic, cardboard, sponge, wood, paper, card, playdough etc.** **material(s), join, cut, scrunch, sew, glue, stick, staple, pin, safely**	**Vocabulary:** **purpose, properties of materials e.g. hard, soft, rigid, bendy, join, hammer, nails, pins**	**Vocabulary:** **purpose, properties of materials e.g. reflective, waterproof, stable, structure, suitable & makes of materials used.**

	Term	Autumn 2 - Puppets	Spring 2 – Moving Picture	Summer 2 - Smoothies
Year 1	Intent	In this unit children will explore the joining techniques of gluing, a running stitch and stapling to join materials together to create a 3D puppet.	In this unit, children will explore 2D mechanisms in everyday life such as pop up cards and in books with moving parts. They will then use one of these mechanisms to create a moving picture.	In this unit children will describe fruits and vegetables and explain how to identify fruits using these characteristics. They will learn the names of a range of places that fruits and vegetables grow. Finally, pupils will select and prepare fruits and vegetables to make a smoothie.
	Key Knowledge	• 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 know that a mechanism is the parts of an object that move together. • To know that a slider mechanism moves an object from side to side. • To know that a slider mechanism has a slider, slots, guides and an object. • To know that bridges and guides are bits of card that purposefully restrict the movement of the slider.	• That a blender is a machine which mixes ingredients together into a smooth liquid. • That a fruit has seeds and a vegetable does not. • That fruits grow on trees or vines. • That vegetables can grow either above or below ground. • That vegetables are any edible part of a plant.
	Key Skills	• Using a template to create a design for a puppet. • Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction. • Reflecting on a finished product, explaining likes and dislikes. • Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons	• Explore and use sliders and levers. • Adapt mechanisms, using bridges or guides to control the movement. • Design a moving story book for a given audience using clearly labelled pictures. • Follow a design to create moving models that use levers and sliders. • Test a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed. • Review the success of a product by testing it with its intended audience.	• Design smoothie carton packaging by hand. • Chop soft fruit and vegetables safely to make a smoothie. • Juice fruits to make a smoothie. • Identify if a food is a fruit. • Tasting and evaluating different foods. • Describe appearance, smell and taste.
	Key Vocabulary	Decorate, design, fabric, glue, model, hand puppet, safety pin, staple, stencil, template	Sliders, mechanism, adapt, design criteria, design, input, model, template, assemble, test	Blend, blender, chopping board, compare, cut, design, evaluate, flavour, fork, fruit, healthy, ingredients, juice, juicer, leaf, plant, recipe, root, seed, select, smoothie, stem, table knife, taste, tree, vegetable, vine
	Prior Learning	In EYFS: Textiles – experiment with different materials and joins. Investigate the best way to join their material to their egg. Textiles – choosing, cutting and joining materials to create clothes for the characters.	In EYFS: Mechanisms – Explore and discuss the mechanisms involved in toys they play with and think about how they work.	In EYFS: Food – • To explore and discuss healthy food choices and to know which foods are good for our growing bodies. • To learn about good hand hygiene to stay healthy. • Explore and use tools to peel and chop.
	Future Learning	Y4 – Fastenings Y6 - Waistcoats	Y2 – Ferris Wheel Y3 – Pneumatic Toy Y5 - Automata	Y2 – Balanced Diet Y3 – Eating Seasonally Y5 – Adapting a Recipe
	Suggested sequence of Lessons	• Joining fabrics using staples, glue and pins. • Joining fabrics using running stitch. • Designing a puppet based on a book character. • Creating a template, cutting material to the template shape and joining material to create 3D puppet. • Finish puppet using different techniques; painting, fabric crayons, sequins, buttons etc. • Evaluate finished product.	• Explore lever mechanisms in existing products; cards and storybooks • Design own moving pictures and select appropriate mechanism for movement • Construct a moving picture • Test and evaluate product against success criteria	• Identifying fruits and vegetables • Understand where different fruits and vegetables grow • Practice cutting and juicing skills • Test different fruits in order to select flavours to combine in a smoothie • Make and evaluate smoothies
	Assessment Task/evidence	Children will have a completed puppet, joined using different and appropriate methods.	Children will have a picture book where each page has a mechanism to make an aspect of the picture move.	Children will have a portfolio of work which demonstrates their understanding of fruits and vegetables, shows their design process and evaluation of their completed product.
Year 2	Term	**Autumn 2 – Baby Bear's Chair**	**Spring 2 – A Balanced Diet**	**Summer 2 – Fairground Wheel**
	Intent	In this unit children will identify a variety of man-made and natural structures and explore the effect of different	In this unit children will name the main food groups and identify foods that belong to each group. They will describe the	In this unit children will explore wheel mechanisms to understand the parts required to make a wheel turn. They

		materials and shapes on the stability of a structure. They will use this knowledge to create a stable chair which stands by itself and bears weight.	taste, feel and smell of a given food and use this knowledge to design a wrap, considering flavour combinations. They will then construct a wrap that meets the design brief and their plan.	will then design and create their own fairground wheel before evaluating their product against given criteria.
	Key Knowledge	• 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.	• That 'diet' means the food and drink that a person or animal usually eats. • What makes a balanced diet. • That the five main food groups are: carbohydrates, fruits and vegetables, protein, dairy and oils and spreads. • That I should eat a range of different foods from each food group, and roughly how much of each food group. • That 'ingredients' means the items in a mixture or recipe. • How to cut, grate, snip and spread to prepare foods. • How to review and give a score to evaluate.	• 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 a mechanism requires an input to produce an output. • To know that it is important to test my design as I go along so that I can solve any problems that may occur.
	Key Skills	• Generate and communicate ideas using sketching and modelling. • Make a structure according to design criteria. • Creating joints and structures from paper/card and tape. • Build a strong and stiff structure by folding paper. • Explore the features of structures. • Compare the stability of different shapes. • Test the strength of their own structures. • Identify the weakest part of a structure. • Evaluate the strength, stiffness and stability of their own structure.	• Chopping foods safely to make a wrap. • Grating foods to make a wrap. • Snipping smaller foods instead of cutting. • Spreading soft foods to make a wrap. • Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Use basic principles of a healthy and varied diet to prepare dishes.	• Selecting a suitable linkage system to produce the desired motions. • Designing a wheel. • Selecting appropriate materials based on their properties. • Selecting materials according to their characteristics. • Following a design brief. • Evaluating different designs. • Testing and adapting a design.
	Key Vocabulary	design criteria, man-made, natural, properties, structure, stable, shape, model, test	appearance, balanced, carbohydrates, chopping board, combination, cut, dairy, design, design brief, diet, evaluate, feel, fruit, grate, grater, ingredients, menu, oils, proteins, review, scissors, smell, snip, spread, taste, vegetables	Design, design criteria, wheel, Ferris wheel, pods, axle, axle holder, frame, mechanism
	Prior Learning	Create and adapt structures to make ramps for toy cars outside. (EYFS) Investigate, design and make boats, thinking about the shape and materials required to float. (EYFS) Create a minibeast habitat which stands up. (EYFS)	• Chopping fruit and vegetables safely to make a smoothie. (Y1) • Tasting and evaluating different foods. (Y1) • Describing appearance, smell and taste. (Y1)	• To know that a mechanism is the parts of an object that move together. (Y1)
	Future Learning	Y4 – Castles Y6 - Playgrounds	Y3 – Eating Seasonally Y5 – Adapting a Recipe	Y3 – Pneumatic Toys Y5 – Automata Toys
	Suggested sequence of Lessons	• To explore the concept and features of structures and the stability of different shapes. • To understand that the shape of the structure affects its strength. • To make a structure according to design criteria. • To produce a finished structure and evaluate its strength, stiffness and stability.	• Recognise foods and their food groups • Identify the balance of food groups in a well balanced meal • Select appropriate equipment to prepare different ingredients • Select well balanced combinations of ingredients according to taste • Plan a recipe based on given criteria • Create and evaluate a healthy wrap	• Explore wheel mechanisms • Design a ferris wheel using given criteria • Plan to build their design and select appropriate materials • Build the frame and wheel then test to ensure wheel can move • Add pods and decoration as designed
	Assessment Task/evidence	Children will have produced a chair structure that can stand up and bear weight.	Children will have a portfolio which demonstrates their understanding of a well balanced diet and the five food groups. It will also include their recipe and evaluation of their completed meal.	Children will have a 'portfolio' with designs and a completed ferris wheel.
Year 3	Term	**Autumn 2 – Pneumatic Toy**	**Spring 2 – Electrical Charm**	**Summer 2 – Eating Seasonally**
	Intent	In this unit, children will explore making items move using a	In this unit, children will develop ideas and code to design a	In this unit children will learn that fruits and vegetables

		simple pneumatic system and produce a toy for younger children.	piece of wearable technology which fulfils their design criteria for a given user.	grow in different countries based on their climates and that seasonal fruits and vegetables grow in a given season. They will learn that eating seasonal fruit and vegetables positively affects the environment and design a tart recipe using seasonal ingredients.
	Key Knowledge	• Learning that different types of drawings are used in design to explain ideas clearly. • Understanding the purpose of exploded-diagrams through the eyes of a designer and their client. • To understand how pneumatic systems work. • To understand that pneumatic systems can be used as part of a mechanism. • To know that pneumatic systems operate by drawing in, releasing and compressing air.	• To understand that, in programming, a 'loop' is code that repeats something again and again until stopped. • To know that a micro:bit is a pocket-sized, codeable computer. • To know that a simulator is able to replicate the functions of an existing piece of technology. • To know what the 'Digital revolution' is and features of some of the products that have evolved as a result. • To understand what is meant by 'point of sale display.' • To know that CAD stands for 'Computer-aided design'. • To know what a focus group is by taking part in one.	• That seasonal means foods that grow in a given season in a given country. • Some seasonal foods that grow in the UK and what season they grow in. • That eating seasonal foods can have a positive impact on the environment. • How to describe the flavour and texture of foods. • How to cut and peel safely. • That the appearance of food is as important as taste. • That similar coloured fruits and vegetables often have similar nutritional benefits.
	Key Skills	• Designing a toy that uses a pneumatic system. • Developing design criteria from a design brief. • Generating ideas using thumbnail sketches and exploded diagrams. • Creating a pneumatic system to create a desired motion. • Building secure housing for a pneumatic system. • Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy. • Selecting materials due to their functional and aesthetic characteristics. • Manipulating materials to create different effects by cutting, creasing, folding and weaving. • Using the views of others to improve designs. • Testing and modifying the outcome, suggesting improvements.	• Problem solving by suggesting potential features on a micro:bit and justifying my ideas. • Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge. • Developing design ideas through annotated sketches to create a product concept. • Developing design criteria to respond to a design brief. • Following a list of design requirements. • Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm. • Analysing and evaluating an existing product. • Using feedback from peers to improve a design.	• Describing how climate affects where foods grow. • Identifying seasonal ingredients from the UK. • Tasting seasonal ingredients. • Describing the texture and flavour of ingredients. • Peeling foods by hand or with a peeler. • Cutting ingredients safely. • Choosing ingredients based on a design brief. • Following the instructions within a recipe. • Describing the benefits of seasonal fruits and vegetables and their impact on the environment.
	Key Vocabulary	Mechanism, lever, pivot, linkage system, pneumatic system, input, output, component, thumbnail sketch, research, adapt, properties, reinforce, motion	computer-aided design (CAD), control, design criteria, develop, digital, display, electronic, electronic products, feature, feedback, form, function, initiate, layers, monitor, net, opinion, product, product design, program, sense, simulator, smart, technology	complementary, country, cut, design, evaluate, export, fruit, grate, import, ingredients, Mediterranean, mock-up, mountain, peel, polar, seasonal, seasons, snip, taste, temperate, texture, tropical, vegetable, weather
	Prior Learning	• Selecting a suitable linkage system to produce the desired motions. • Selecting appropriate materials based on their properties. • Selecting materials according to their characteristics. • Following a design brief. • Evaluating different designs. • Testing and adapting a design. • To know that a mechanism requires an input to produce an output.	• Following a design brief. Y2 • Evaluating different designs. Y2 • Testing and adapting a design. Y2	• Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. (Y2) • Understand and use basic principles of a healthy and varied diet to prepare dishes. (Y1 & 2) • And all learning from previous year groups.
	Future Learning	Y5 – Pneumatic Toys	Y5 – Monitoring Devices	Y5 – Adapting a recipe
	Suggested sequence of Lessons	• Explore pneumatics: experiments and looking at existing products • Explore pneumatics: experiment with creating systems to move objects with pneumatic pressure • Design pneumatic toy using exploded diagram and	• Evaluate existing wearable technology • Develop a design criteria • Use code to program and control a product • Develop and communicate ideas using appropriate sketches	• Explain why different food is grown in different places around the world • Understand the benefits of eating seasonally • Develop cutting and peeling skills • Taste and evaluate savoury seasonal ingredients

		thumbnail sketches • Make pneumatic toy	• Develop advertising using CAD software • Improve design using feedback given by others	• Design a savoury tart to appeal visually and using complementary flavours • Make and evaluate seasonal tarts
	Assessment Task/evidence	Children will have a 'portfolio' including a variety of diagrams and planning sequences. They will also have a working pneumatic toy.	Children will have produced a code which allows their wearable technology to meet their design criteria. They will also have product sketches to demonstrate what shell their technology will be part of and a CAD generated image of their design ideas.	Children will have a portfolio including a 'mission statement' explaining why they are using seasonal and local ingredients, a map of world foods, their design with justifications and their evaluation of their completed tart.
Year 4	Term	**Autumn 2 - Castles**	**Spring 2 - Torches**	**Summer 2 – Book Sleeve**
	Intent	In this unit, children will explore castle designs throughout time and use their knowledge of 3D shapes to create their own castle model.	In this unit, children will identify useful electrical products and learn about electrical circuits and conductive materials before designing and creating a torch.	In this unit children will design and create a book sleeve with a fastening. They will work to a design specification to produce a product for an end user.
	Key Knowledge	• Draw and label a simple castle that includes the most common features. • Recognise that a castle is made up of multiple 3D shapes. • Design a castle with key features which satisfy a given purpose. • Score or cut along lines on the net of a 2D shape. • Utilise knowledge of geometric shapes to build a complex structure. • Evaluate their work by answering simple questions. • To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures. • To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse – and their purpose. • To know that a façade is the front of a structure.	• 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 that a switch can be used to complete and break an electrical circuit.	• To know that a fastening is something that holds two pieces of material together. • To know that different fastening types are useful for different purposes. • To know that creating a mock-up (prototype) of their design is useful for checking ideas and proportions.
	Key Skills	• Develop and use knowledge of how to construct strong, stiff shell structures. • Designing a castle with key features to appeal to a specific person/purpose. • Drawing and labelling a castle design using 2D shapes. • Designing and/or decorating a castle tower. • Constructing a range of 3D geometric shapes using nets created by scoring and cutting. • Creating special features for individual designs. • Making facades from a range of recycled materials. • Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. • Suggesting points for modification of the individual designs.	• Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. • Making a torch with a working electrical circuit and switch. • Using appropriate equipment to cut and attach materials. • Assembling a torch according to the design and success criteria. • Evaluating electrical products. • Testing and evaluating the success of a final product.	• Writing design criteria for a product, articulating decisions made. • Designing a personalised book sleeve. • Making and testing a paper template with accuracy and in keeping with the design criteria. • Measuring, marking and cutting fabric using a paper template. • Selecting a stitch style to join fabric. • Sewing neatly using small regular stitches. • Incorporating a fastening to a design. • Testing and evaluating an end product against the original design criteria.
	Key Vocabulary	Cuboid, Edge, Face, Prism, Shell structure, Vertex, 2D, 3D, castle, design, key features, net, scoring, shape, stable, stiff, strong, structure, tab	Battery, bulb, buzzer, conductor, circuit, circuit diagram, electricity, insulator, series circuit, switch, component, design, design criteria, diagram, evaluation, LED, model, shape, target, audience, input, recyclable, theme, aesthetics, assemble, equipment, ingredients, packaging, properties, sketch, test	Criteria, Fabric, Fastening, Fix, Mock-up, Stitch, Template
	Prior Learning	• Making a structure according to design criteria. (Y2) • Creating joints and structures from paper/card and tape. (Y2) • Building a strong and stiff structure by folding paper. (Y2) • Exploring the features of structures. (Y2) • Comparing the stability of different shapes. (Y2)	• Developing design ideas through annotated sketches to create a product concept. • Developing design criteria to respond to a design brief. • Following a list of design requirements. • Analysing and evaluating an existing product. • Using feedback from peers to improve a design.	• Using a template to create a design. (Y1) • Cutting fabric neatly with scissors. (Y1) • Using joining methods. (Y1) • Sequencing steps for construction. (Y1) • Reflecting on a finished product, explaining likes and dislikes. (Y1) • Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and

		• Testing the strength of their own structures. (Y2) • Identifying the weakest part of a structure. (Y2)		ribbons (Y1)
	Future Learning	Y6 - Playgrounds	Y6 – Steady Hand Game	Y6 - Waistcoats
	Suggested sequence of Lessons	• Explore use of a variety of 3D shapes in existing castles • Design a castle using knowledge of 2D and 3D shapes • Create and construct nets for 3D shapes • Assemble 3D shapes to create castle as designed	• Learn about electrical circuits and their required components • Analyse and evaluate existing torches • Design a torch to fit a set of specific user needs • Make and evaluate a torch	• Evaluate a variety of fastenings. • Design a book sleeve to meet given criteria and plan sequence of work. • Create a paper mock up to give a template to work to and ensure accuracy. • Practice running stitch. • Create book sleeve
	Assessment Task/evidence	Children will produce a castle model made up of a range of 3D shapes.	Children will produce a torch which works via a switch and meets the needs of a given user.	Children will have a 'portfolio' with designs and mock up included. They will also have a book sleeve which meets the given criteria.
Year 5	Term	**Autumn 2 – Adapting a recipe**	**Spring 2 - Automata**	**Summer 2 – Doodlers**
	Intent	In this unit children will learn about the process food undergoes to get into our kitchens. They will adapt an existing recipe to improve its nutritional value and make a meal based on their recipe.	In this unit children will experiment with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement.	In this unit, children will explore the factors that affect a products form and function before designing their own product and creating a kit, with instructions, for a user to create their product.
	Key Knowledge	• Understanding where food comes from - learning that beef is from cattle and how beef is reared and processed • Learning to adapt a recipe to suit dietary requirements or make it healthier • Comparing two adapted recipes using a nutritional calculator and then identifying the healthier option • Understanding the combinations of food that will complement one another • Understanding where food comes from, describing the process of 'Farm to Fork' for a given ingredient • Understanding cross-contamination and how it can be prevented.	• To understand that the mechanism in an automata uses a system of cams, axles and followers. • To understand that different shaped cams produce different outputs. • To know that an automata is a hand-powered mechanical toy. • To know that a cross-sectional diagram shows the inner workings of a product. • To understand how linkages change the direction of a force. • To understand that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles.	• To know that, in a series circuit, electricity only flows in one direction. • 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	• Use utensils and equipment including heat sources to prepare and cook food. • Explaining the farm-to-fork process. • Researching existing recipes. • Suggesting alternative ingredients. • Analysing nutritional content. • Writing an alternative recipe. • Making a developed recipe.	• Making things move at the same time. • Draw cross-sectional diagrams to show the inner-workings of their design. • Measuring, marking and checking the accuracy of the jelutong and dowel pieces required. • Measuring, marking and cutting components accurately using a ruler and scissors. • Assembling components accurately to make a stable frame. • Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set. • Evaluating the work of others and receiving feedback on own work. • Applying points of improvement to their toys. • Describing changes they would make/do if they were to do the project again.	• Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product. • Developing design criteria based on findings from investigating existing products. • Developing design criteria that clarifies the target user. • Altering a product's form and function by tinkering with its configuration. • Making a functional series circuit, incorporating a motor. • Constructing a product with consideration for the design criteria. • Breaking down the construction process into steps so that others can make the product. • Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. • Determining which parts of a product affect its function and which parts affect its form. • Analysing whether changes in configuration positively or negatively affect an existing product. • Peer evaluating a set of instructions to build a product.
	Key Vocabulary	beef, brand, cook, cross-contamination, enhance, equipment	accurate, assembly-diagram, automata, axle, bench hook, cam, clamp, component, cutting list, diagram, dowel, exploded-	circuit component, configuration, current, develop, DIY, investigate, motor, motorised, problem solve, product,

		evaluate, grate, hygiene, ingredients, measure, nutrient, nutrition, nutritional value, preference, press, process, recipe, safety	diagram, finish, follower, frame, function, linkage, mark out, measure, mechanism, model, research, right-angle, set square, tenon saw	analysis, series circuit, stable, target user
	Prior Learning	• Describing how climate affects where foods grow. (Y3) • Identifying seasonal ingredients from the UK. (Y3) • Tasting seasonal ingredients. (Y3) • Describing the texture and flavour of ingredients. (Y3) • Peeling foods by hand or with a peeler. (Y3) • Cutting ingredients safely. (Y3) • Choosing ingredients based on a design brief. (Y3) • Following the instructions within a recipe. (Y3) • Describing the benefits of seasonal fruits and vegetables and their impact on the environment. (Y3) • And all learning from prior year groups	• Learning that different types of drawings are used in design to explain ideas clearly. (Y3) • Understanding the purpose of exploded-diagrams through the eyes of a designer and their client. (Y3) • Selecting materials due to their functional and aesthetic characteristics. (Y3) • Manipulating materials to create different effects by cutting, creasing, folding and weaving. (Y3) • Using the views of others to improve designs. (Y3) • Testing and modifying the outcome, suggesting improvements. (Y3) • Selecting a suitable linkage system to produce the desired motions. (Y2)	• To understand that electrical conductors are materials which electricity can pass through. (Y4) • To understand that electrical insulators are materials which electricity cannot pass through. (Y4) • To know that a battery contains stored electricity that can be used to power products. (Y4) • To know that an electrical circuit must be complete for electricity to flow. (Y4) • To know that a switch can be used to complete and break an electrical circuit. (Y4)
	Future Learning	KS3	KS3	Y6 – Steady Hand Game
	Suggested sequence of Lessons	• Understand how ingredients are reared and processed • Make adaptations to an existing recipe • Evaluate nutritional content of existing products • Practice food preparation skills • Follow and make an adapted recipe	Explore automata toys and create design criteria for a product. Create a frame for automata toy using wood and an exploded diagram. Explore the relationship between cam profiles and follower movement to inform a design decision. (Use exploded diagrams to understand how cams fit together.) Turn their frame, cams and axles into a toy by adding decoration.	Understand how motors are used in electrical products. Investigate existing products to evaluate their form and function and factors affecting these. Apply findings from research to develop a new product. Develop a kit which enables an end user to assemble their product.
	Assessment Task/evidence	Children will produce a nutritionally balanced meal for a specific client, working from a recipe which they have adapted.	Children will have a working automata toy which meets the design criteria they produced.	Children will produce an electrical 'doodler' which incorporates a motor.
Year 6	Term	**Autumn 2 – Steady Hand Game**	**Spring 2 - Playgrounds**	**Summer 2 - Waistcoats**
	Intent	In this unit, children will consider how young children develop vital skills through play before designing and creating an electronic game that will develop motor skills.	In this unit, children will consider existing playground structures before designing their own dream playground. They will use their knowledge of stable structures to create a scale model of their design.	In this unit children will consider a range of factors in their design criteria and use this to create a waistcoat design. They will then use a template to mark and cut out a design and use a running stitch to join fabric to make a functional waistcoat. They will attach a secure fastening, as well as decorative objects and, finally, evaluate their final product.
	Key Knowledge	• To know that 'form' means the shape and appearance of an object. • To know that batteries contain acid that is dangerous. • To know the difference between 'form' and 'function'. • To understand that 'fit for purpose' means that a product works how it should and is easy to use. • To know that 'form over purpose' means that a product looks good but does not work very well. • To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind. • To understand the diagram perspectives 'top view', 'side view' and 'back'. • To understand the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'.	• To know that structures can be strengthened by manipulating materials and shapes. • To understand what a 'footprint plan' is. • To understand that in the real world, design can impact users in positive and negative ways. • To know that a prototype is a cheap model to test a design idea.	• To understand that it is important to design clothing with the client/target customer in mind. • To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric. • To understand the importance of consistently sized stitches.
	Key Skills	• Designing a steady hand game, identifying and naming the components required. • Drawing a design from three different perspectives. • Generating ideas through sketching and discussion. • Modelling ideas through prototypes.	• Designing a playground featuring a variety of different structures, giving consideration to how the structures will be used. • Considering effective and ineffective designs. • Building a range of play apparatus structures drawing upon	• Designing a waistcoat in accordance with a specification and design criteria to fit a specific theme. • Annotating designs. • Using a template when pinning panels onto fabric. • Marking and cutting fabric accurately, in accordance

	• Constructing a stable base for a game. • Accurately cutting, folding and assembling a net. • Decorating the base of the game to a high-quality finish. • Making and testing a circuit. • Incorporating a circuit into a base. • Testing their own and others' finished games, identifying what went well and making suggestions for improvement • Analyse a selection of existing children's toys.	new and prior knowledge of structures. • Measuring, marking and cutting wood to create a range of structures. • Using a range of materials to reinforce and add decoration to structures. • Improving a design plan based on peer evaluation. • Testing and adapting a design to improve it as it is developed. • Identifying what makes a successful structure.	with a design. • Sewing a strong running stitch, making small, neat stitches and following the edge. • Tying strong knots. • Decorating a waistcoat – attaching objects using thread and adding a secure fastening. • Using different decorative stitches. • Sewing accurately with even regularity of stitches. • Evaluating work continually as it is created.
Key Vocabulary	assemble, battery, battery pack, benefit, bulb, bulb holder, Buzzer, circuit, circuit symbol, component, conductor, copper, design, design criteria, evaluation, fine motor skills, fit for purpose, form, function, gross motor skills, insulator, LED, user	apparatus, design criteria, equipment, playground, landscape, features, cladding	Mock up, Pattern/template, Seam allowance, Specification, Tacking, Working drawing, CAD, CAM
Prior Learning	• To understand that electrical conductors are materials which electricity can pass through. (Y4) • To understand that electrical insulators are materials which electricity cannot pass through. (Y4) • To know that a battery contains stored electricity that can be used to power products. (Y4) • To know that an electrical circuit must be complete for electricity to flow. (Y4) • To know that a switch can be used to complete and break an electrical circuit. (Y4)	• Develop and use knowledge of how to construct strong, stiff shell structures. (Y4) • To understand that wide and flat based objects are more stable. (Y4) • To understand the importance of strength and stiffness in structures. (Y4) • Creating special features for individual designs. (Y4) • Making facades from a range of recycled materials. (Y4) • Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. (Y4) • Suggesting points for modification of the individual designs. (Y4)	• Making and testing a paper template with accuracy and in keeping with the design criteria. • Measuring, marking and cutting fabric using a paper template. • Selecting a stitch style to join fabric. • Sewing neatly using small regular stitches. • Incorporating a fastening to a design. • Testing and evaluating an end product against the original design criteria.
Future Learning	KS3	KS3	KS3
Suggested sequence of Lessons	• Research and analyse existing children's toys. • Design a game to improve children's motor skills. • Construct a stable base for their games. • To assemble the required components for their game. • Evaluate their game against their design criteria.	• Explore existing playground structures • Design a playground with at least 5 structures, producing appropriate sketches and a floorplan • Build structures • Improve structures using features such as cladding • Add structures to floorplan and introduce landscaping features to improve visual appeal	• Design a waistcoat against given criteria for an end user. • Adapt a template to fit their design. • Mark and cut fabric using a template. • Assemble waistcoat using running stitch. • Add decorative features to waistcoat.
Assessment Task/evidence	Children will produce an electrical game which helps to improve children's motor skills.	Children will produce a scale model of their playground design with structures which are strong and stable.	Children will produce a waistcoat to fit a given model, with design features which conform to the specification given for an end user.