We speak the language of

Design and Technology

By the time they leave pupils will:
⌖ Understand the impact of design and technology on daily life and the wider world (past and present) ⌖ Use research and develop design criteria to inform the designing and making of products that are fit for purpose, aimed at particular individuals or groups ⌖ Use a range of techniques and equipment confidently, making informed choices based on the suitability and effectiveness of different processes ⌖ Test, evaluate and refine ideas and products against a specification ⌖ Use and combine a variety of approaches to generate creative ideas ⌖ Look closely and methodically when analysing a product, considering why it was made, what it is made from, how well it is made and finished, and how well it meets the needs of the consumer ⌖ Understand the principles of a healthy and varied diet ⌖ Know how to create simple dishes, applying the principles of nutrition and healthy eating
EYFS links
Expressive Arts and Design Return to and build on their previous learning, refining ideas and developing their ability to represent them Create collaboratively sharing ideas, resources and skills **Physical Development** Develop their small motor skills so that they can use a range of tools competently, safely and confidently **Creating with Materials** Safely use and explore a variety of materials, tools and techniques Share their creations, explaining the process they have used; make use of props and materials when role playing characters in narratives and stories **Fine Motor Skills** Use a range of small tools, including scissors, paint brushes and cutlery

Work safely
Responsible designers and makers
Knowledge of tools
Show innovation
Knowledge of brief

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Curriculum End Points – DT

EYFS – Little Wrens

Milestone I

- I can find my peg and put my own coat on – ask for help if I need it
- I where the toilet is

Milestone II

- I can put my belongings in the right place
- I can take my coat off
- I can take my shoes off
- I can attempt to put my coat and wellies back on
- I can use the toilet, wash my hands with some support

Milestone III

- I can put my own coat on
- I can change my footwear with support
- I can use the toilet
- I know why I have to wash my hands

Final Milestone

- I am beginning to fasten my own coat
- I can change my own footwear (for inside and outside)
- I can use the toilet and wash my hands independently
- I know that some foods are healthy

Independence and self care

Milestone I

- To use hand-eye coordination to explore and manipulate tools and resources.
- To make random marks with a range of tools – brushes and pencils.

Milestone II

- Make more controlled movements with mark-making tools such as lines and circles.
- Hold scissors and open and close them.

Milestone III

- Develop pincer grip
- Form some letters from their name with support.
- Use scissors and attempt to cut paper.

Final Milestone

- To hold and use a range of tools with a comfortable grip.
- To write most letters from their name accurately.
- Snip with scissors.

Physical Development
Handling

EYFS – Reception Robins

ELG: Creating with Materials	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; Share their creations, explaining the process they have used. 
ELG: Fine Motor Skills	Use a range of small tools, including scissors, paint brushes and cutlery; Begin to show accuracy and care when drawing. 

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The end points for each year group show how children apply the knowledge, skills and understanding they are taught before moving on with their learning.

Year 1

Design

Fruit & Vegetables	Constructing Windmills	Moving Story book	Wheels and axles	Puppets
Children can name a variety of common fruit and vegetables. Children can explain how to tell the difference between fruit & vegetables. Children can explain where some common fruit or vegetables grow. Children can explain which parts of a plant we eat.	Children can explain what a windmill is. Children can name the parts of a windmill (turbine, axle) Children can explain how the sails (turbines) of a windmill move. Children can explain what qualities a windmill needs, e.g. it is stable.	Children can explain how they can make characters in a storybook move with a mechanism. Children can explain what a mechanism is. Children can use correct vocabulary to explain how a mechanism moves in a book, e.g. up, down, side to side, left and right.	Children can identify an axle, chassis and axle holder. Children can explain how wheels spin. Children can draw a model car, including wheels, axle and axle holder.	Children can explain how to join parts. Children can use a template. Children can explain which joining technique is the most suitable for different products.

Year 2

Design

Fairground Wheel	A balanced Diet	Baby bear's chair	Pouches	Moving Monsters
Children can explain what a mechanism is. Children can explain what a structure is. Children can explain what stable, strong, weak, flexible and stiff mean. Children can label the main parts of a Ferris wheel and explain how it works.	Children can explain how we identify fruit. Children can explain what we mean by diet and what a healthy diet is. Children can explain how we store food safely. Children can explain what nutrients are. Children can explain the main food groups.	Children can explain the difference between a natural and a manmade object. Children can explain the function of a chair. Children can explain why a product needs testing before use. Children can explain what stable, strong, weak, flexible and stiff mean.	Children can explain what we mean by a joining technique and give some examples of how we join fabric. Children can explain what a template is. Children can demonstrate a simple running stitch and why it is important to knot your thread at the end of sewing.	Children can explain what a mechanism is. Children can explain what a design criteria is. Children can use terminology such as lever, pivot and linkage correctly. Children can explain what an input and an output is. Children can describe the movement a mechanism makes.

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Year 3

Design | Make | Evaluate | Technical Knowledge

Cushions	Constructing a castle	Eating seasonally	Electronic charm	Pneumatic toys
Children can explain how to join materials. Children can explain what a template is. Children can describe 'applique' technique. Children can describe a running stitch and a cross-stitch. Children can explain what a seam is.	Children can explain the difference between a natural and a manmade object. Children can explain what a façade is. Children can explain what a feature is. Children can explain what a paper net is and why we use one. Children can design a castle and explain what makes it a good design. Children can list the features of a castle.	Children can explain what a diet is and what makes a healthy diet. Children can explain what a nutrient is. Children can explain what vitamins, minerals and fibre do. Children can explain what seasonal food is. Children can explain how to stay safe in the kitchen. Children can explain how the climate affects what we can grow in our country.	Children can explain what a design criteria is. Children can explain what a product analysis is. Children can explain what a loop in programming is. Children can explain what product function they can create using a loop. Children can explain what CAD stands for. Children can explain an electric device they use and how it is useful.	Children can explain what a mechanism is. Children can explain what a pneumatic system is. Children can explain what an exploded-diagram is. Children can explain what a thumbnail sketch is. Children can explain what motion and function mean in the context of their design. Children can explain what a paper net is and why we use one. Children can explain why drawings and diagrams help a designer.

Year 4

Design | Make | Evaluate | Technical Knowledge

Making a slingshot car	Fastenings	Pavilions	Adapting a recipe	Torches
Children can explain what a mechanism is. Children can explain what an exploded-diagram is. Children can explain what aesthetics are. Children can explain what air resistance is. Children can explain what a template is. Children can explain why is it important to test and evaluate a product.	Children can explain what the term accurate means in a product. Children can explain what we mean by threading a needle. Children can explain what a fastening is. Children can identify a zipper, a toggle and a press stud. Children can explain what a prototype is and why we use one.	Children can explain what a design criteria is. Children can explain what aesthetics are. In a design, children can explain what a theme is. Children can explain what a pavilion is. Children can explain what a products function is. Children can explain how to make a structure stronger.	Children can explain what a recipe is. Children can explain what a food in season is. Children can explain how to stay safe in the kitchen. Children can explain different cooking techniques. Children can explain how to improve a recipe. Children can explain basic hygiene in a kitchen.	Children can explain what electricity is. Children can explain what a circuit diagram is. Children can explain electrical symbols. Children can explain what a conductor and an insulator is. Children can explain what a series circuit is. Children can explain what a portable form of electricity. Children can list some electrical health and safety tips.

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Year 5

Design

What could be healthier?

Children can explain what a balanced diet consists of.
Children can explain what cross-contamination in a kitchen means and how it happens.
Children can explain what welfare means.
Children can explain the 'farm to fork' process.
Children can give an example of a healthy meal and explain why it is healthy.

Monitoring devices

Children know that a 'device' means equipment created for a purpose or job and that monitoring devices observe and record
Children know a sensor is a tool or device to monitor, detect and respond to changes for a purpose.
Children understand conditional statements in programming are a set of rules which are followed if certain conditions are met

Make

Making a pop-up book

Children can explain what a design brief is.
Children can explain what a design criteria is.
Children can explain what a mechanism is.
Children can explain what an input and output is.
Children can explain what a prototype is.
Children can explain what a template is.
Children can explain what an exploded-diagram is.

Evaluate

Doodlers

Children can identify factors that could be changed on existing products.
Children can develop a design criteria that clarifies the target user.
Children can make a functional series circuit with a motor.
Children can break down the construction process into steps for others.
Children can analyse whether changes in configuration positively or negatively affect an existing product.

Technical Knowledge

Bridges

Children can name common tools, e.g. file, screwdriver, chisel and what they are used for.
Children can explain what a try square or a set square are.
Children can name different types of bridges, e.g. truss, beam, arch.
Children can explain how the design of a bridge distributes the weight evenly.
Children can explain the properties of different materials.

Year 6

Design

Playgrounds

Children can explain how to make a structure stronger.
Children can name different tools and their purpose, e.g. clamp, vice, brace, holding device, Tenon saw, jig-saw, hack saw, coping saw.
Children can explain what a prototype is.
Children can explain what Jelutong is.
Children can explain different properties of materials and why they are suitable for a playground.
Children can explain the health and safety rules for woodwork tools.

Automata toys

Children can explain what a design brief is.
Children can explain what an automata is.
Children can explain what mechanical toys from the Victorian era.
Children can explain what tools can be used for different purposes.
Children can explain how to stay safe when using different tools.
Children can explain what a cross-sectional diagram is.
Children can explain what an exploded-diagram is.

Make

Steady hand game

Children can explain what product analysis is.
Children can explain what a series circuit is.
Children can explain what we mean by form over function.
Children can explain what a buzzer is.
Children can explain what a LED circuit is.
Children can explain what happens when a rod touches the wire in a steady hand game.

Evaluate

Navigating the world

Children can explain what we mean by form.
Children can explain what we mean by function.
Children can explain what we mean by multifunctional.
Children can explain who a client is in a design project.
Children can explain what a magnetometer is.
Children can explain what an accelerometer is.
Children can explain what a sensor is and why they are used.
Children can explain what the pros and cons are of 3D CAD modelling.

Technical Knowledge

Come dine with me

Children can explain what cross-contamination in a kitchen is and why it happens.
Children can explain what 'reared' in farming means.
Children can explain what a method is in a recipe.
Children can explain what a national dish is.
Children can explain what processed foods are.
Children can explain how to be hygienic in a kitchen.
Children can explain how to stay safe in a kitchen.

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Progression in DT from EYFS to Year 6

EYFS – Little Wrens

Throughout the year…

Physical Development	Children will have: • Extensive opportunities to develop their gross motor skills through daily access to our outdoor provision, school field and MUGA • Opportunities to explore the climbing frame and trim trail confidently, safely and independently • Opportunities to be taught how to climb trees safely and climb up onto the tyre swing • Daily timetabled outdoor sessions in all weathers providing opportunities to develop large muscle groups – running, hopping, climbing, jumping, skipping, swinging etc • Daily access to our large mud kitchen, outdoor loose parts area, and wooden hollow blocks • A daily mile session around our school grounds • Dough Disco sessions 3 x a week to develop fine motor skills • Squiggle Whilst You Wiggle sessions 2 x a week to develop gross motor and fine motor skills • Weekly yoga and dance sessions • Access to a variety of one-handed tools such as scissors - cutting station available every other half term to support this skill • Access to hand / finger strengthening activities such as threading, weaving, cutting, building, play dough • Support from practitioners to develop independence in dressing / undressing and in meeting their own care needs e.g. using the toilet and washing and drying their hands • Daily opportunities to mark-make on a large and small scale outdoors and indoors *Practitioners will closely monitor whether children are able to hold pens and pencils in a comfortable grip and will support accordingly by identifying whether they need more gross motor or fine motor activities and encouraging them with this, offering a differentiated range of mark-making tools and equipment

Subject	Autumn term 1 – What Makes me 'me'?	Autumn term 2 – Let's Celebrate
Expressive Arts and Design	• Sing action songs with visuals and props (puppets, interactive slides) • Sing seasonal songs • Listen and engage with Seasonal poems from The Poetry Basket • Develop own stories using small world equipment (animal sets, dolls and doll houses, blocks)	• Experiment with a range of materials (paint, dough, sensory rice, shaving foam, gloop, brusho) • Explore colour and mixing • Learn and perform Christmas songs • Listen, engage with and perform Seasonal poems from The Poetry Basket • Experiment with gluing to join materials in our glue table • Explore different materials freely and decide how to use them and what to make (Junk modelling area)

Subject	Spring term 1 – Snow and Ice	Spring term 2 – People who help us
Expressive Arts and Design	• Perform a range of action songs • Sing seasonal songs • Recite and perform known poems from The Poetry Basket • Continue to develop own stories using small world equipment (animal sets, dolls and doll houses, blocks) and construction sets	• Continue to experiment with a range of materials (paint, dough, sensory rice, shaving foam, gloop, brusho) • Use knowledge of colour mixing to create a desire effect • Recite and perform known poems from The Poetry Basket • Combine materials, deciding what to make (Junk modelling area)

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Subject	Summer term 1 – Growth and Change	Summer term 2 – On the Move
Expressive Arts and Design	• Develop own stories and work alongside others using small world equipment (animal sets, dolls and doll houses, blocks) and construction sets • Use a range of materials to make a desired product	• Learn and perform songs for end of year graduation performance • Children will make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings

EYFS – Reception Robins

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Reception Long Term Plan 23-24

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
General Themes	Friendship & Animals	Stars & Space	Environment	Traditional Tales	Growing	The Seaside
Physical Development	Physical activity is **vital** in children's all-round development, enabling them to **pursue happy, healthy and active lives**. Gross and fine motor experiences develop incrementally throughout early childhood, starting with **sensory explorations** and the development of a **child's strength, co-ordination and positional awareness** through tummy time, crawling and play movement with both objects and adults. By creating games and providing opportunities for play both indoors and outdoors, adults can support children to develop their **core strength, stability, balance, spatial awareness**, co-ordination and agility. Gross motor skills provide the foundation for developing healthy bodies and social and emotional well-being. **Fine motor control and precision helps with hand-eye co-ordination**, which is later linked to **early literacy**. Repeated and varied opportunities to explore and play with small world activities, puzzles, arts and crafts and the practice of using small tools, with feedback and support from adults, allow children to develop **proficiency, control and confidence.**					
Fine Motor Continuously check the process of children's handwriting (pencil grip and letter formation, including directionality). Provide extra help and guidance when needed.	Manipulate objects with good fine motor skills - Mini sand station, Cutting station, differentiated mark making tools and scissors Weekly funky finger activity to develop strength Core body strength (have good control of their trunk and be able to reach forward in a controlled way) Postural control (maintain own balance without using their hands) Shoulder girdle (control, strength, stamina and flexibility to grasp and manipulate objects) Joint pivots (coordinating shoulder, elbow, wrist movements to move the hand in different directions) Hand-eye coordination (guide, direct and control hand movements across a page as they marks) Spatial awareness (control of sizing and spacing) Proprioceptor control (body awareness to detect and control force and pressure) Visual-motor integration (master copying pre-writing shapes and patterns)					
Daily opportunities for Fine Motor Activities	Pen Disco pre-writing patterns I – 0 + \ / x (zigzag) Funky Finger Assessment Pen Grip Assessment Cutting Assessment	Pen Disco pre-writing patterns I – 0 + \ / x (zigzag) intro spirals and loops Introduction to letter writing families	Pen Disco Letter families on lined paper Funky Finger Assessment Pen Grip Assessment Cutting Assessment Develop muscle tone to put pencil pressure on paper	Pen Disco Letter families on lined paper Form lower case letter shapes Develop an effective grip Use effective amount of pressure on paper	Lower case letter formation practise Pen Disco on lined paper Funky Finger Assessment Pen Grip Assessment Cutting Assessment Refine shape and size of letters	Lower case letter formation practise Pen Disco on lined paper Form lower case letter shapes correctly Begin to form Upper case letters Use an effective grip Use effective amount of pressure on paper
Gross Motor Funky Finger Activities Pen Disco	From Development Matters 20': Revise and refine the fundamental movement skills they have already acquired: - rolling - crawling - walking - jumping - running - hopping - skipping – climbing Progress towards a more fluent style of moving, with developing control and grace. Develop the overall body strength, co-ordination, balance and agility needed to engage successfully with future physical education sessions and other physical disciplines including dance, gymnastics, sport and swimming. Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Suggested tools: pencils for drawing and writing, paintbrushes, scissors, knives, forks and spoons. Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor. Confidently and safely use a range of large and small apparatus indoors and outside, alone and in a group. Develop overall body-strength, balance, co-ordination and agility. Further develop and refine a range of ball skills including: throwing, catching, kicking, passing, batting, and aiming. Develop confidence, competence, precision and accuracy when engaging in activities that involve a ball					

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Design - Skill					
Structures	• Learning the importance of a clear design criteria • Including individual preferences and requirements in a design	• Generating and communicating ideas using sketching and modelling • Learning about different types of structures, found in the natural world and in everyday objects	• Designing a castle with key features to appeal to a specific person/ purpose • Drawing and labelling a design using 2D shapes, labelling: - the 3D shapes that will create the features - materials need and colours. • Designing and/or decorating a castle tower on CAD software.	• Designing a stable structure that is aesthetically pleasing and selecting materials to create a desired effect • Building frame structures designed to support weight	• Designing a stable structure that is able to support weight • Creating frame structure with focus on triangulation	• Designing a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs
	Make - Skill					
	• Making stable structures from card, tape and glue. • Learning how to turn 2D nets into 3D structures. • Following instructions to cut and assemble the supporting structure of a windmill. • Making functioning turbines and axles which are assembled into a main supporting structure.	• Making a structure according to design criteria • Creating joints and structures from paper/card and tape • Building a strong and stiff structure by folding paper.	• Constructing a range of 3D geometric shapes using nets • Creating special features for individual designs • Making facades from a range of recycled materials	• Creating a range of different shaped frame structures • Making a variety of free standing frame structures of different shapes and sizes • Selecting appropriate materials to build a strong structure and for the cladding • Reinforcing corners to strengthen a structure • Creating a design in accordance with a plan • Learning to create different textural effects with materials	• Making a range of different shaped beam bridges • Using triangles to create truss bridges that span a given distance and supports a load • Building a wooden bridge structure • Independently measuring and marking wood accurately • Selecting appropriate tools and equipment for particular tasks • Using the correct techniques to saws safely • Identifying where a structure needs reinforcement and using	• Building a range structures drawing upon 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

					card corners for support • Explaining why selecting appropriating materials is an important part of the design process. • Understanding basic wood functional properties.	
	Evaluation - Skill					
	• Suggest points for improvements	• Testing the strength of own structures • Identifying the weakest part of a structure • Evaluating the strength, stiffness and stability of own structure	• 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	• Evaluating structures made by the class • Describing what characteristics of a design and construction made it the most effective • Considering effective and ineffective designs	•Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary • Suggesting points for improvements for own bridges and those designed by others	• 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
	Technical knowledge					
	• 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	• 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'	• To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures.	• To understand what a frame structure is. • To know that a 'free-standing' structure is one which can stand on its own	• To understand some different ways to reinforce structures. • To understand how triangles can be used to reinforce bridges. • To know that properties are words that describe the form and function of materials. • To understand why material selection is important based on properties. • To understand the material (functional and aesthetic)	• Knowing that structures can be strengthened by manipulating materials and shapes

	for different purposes. • To know that a structure is something that has been made and put together.	structure or material is one which does not bend easily.			properties of wood.	
Key Assessment Questions	Can I test a finished product, explaining likes and dislikes? Can I describe the purpose of structures? Can I improve the strength of structures? Can I turn a 2D net in to a 3D structure?	**Can I generate and communicate my ideas?** **Do I know about different structures in the natural world and everyday objects?** **Can I evaluate the strength, stiffness and stability of my structure?**	Can I construct a range of 3D geometric shapes? Can I use terminology involved in structures? Can I evaluate an end product?	Can I create a stable structure that is aesthetically pleasing? Can I build on my knowledge of net and frame structures? Can I consider effective and ineffective designs?	Can I reinforce a structure, identifying points of weakness? Can I mark and measure wood accurately? Can I select and use appropriate tools for a task?	What is landscape design and how is it used? How and why are structures reinforced? Why would designers use a prototype? Describe some views of designs we can use. How can we use tools safely?
Mechanisms	**Design – Skills**					
	• Explaining how to adapt mechanisms, using bridges or guides to control the movement • Designing a moving story book for a given audience • Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move • Creating clearly labelled drawings which illustrate movement	• Selecting a suitable linkage system to produce the desired motion. • Designing a wheel. • Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria.	• Designing a toy which uses a pneumatic system • Developing design criteria from a design brief • Generating ideas using thumbnail sketches and exploded diagrams • Learning that different types of drawings are used in design to explain ideas clearly	• Designing a shape that reduces air resistance • Drawing a net to create a structure from • Choosing shapes that increase or decrease speed as a result of air resistance • Personalising a design	• Designing a popup book which uses a mixture of structures and mechanisms • Naming each mechanism, input and output accurately • Storyboarding ideas for a book	• After experimenting with a range of cams, create a design for an automata toy based on a choice of cam to create a desired movement • Understanding how linkages change the direction of a force • Making things move at the same time • Understanding and drawing cross-sectional diagrams to show the inner-workings of my design.
	Make - Skills					
	• Following a design to create moving models that use levers and sliders • Adapting mechanisms when:	• Selecting materials according to their characteristics • Following a design brief Making linkages using card for levers and split pins for pivots	• Creating a pneumatic system to create a desired motion • Building secure housing for a pneumatic system • Using syringes and balloons	• Measuring, marking, cutting and assembling with increasing accuracy • Making a model based on a chosen design	• Following a design brief to make a pop up book, neatly and with focus on accuracy • Making mechanisms and/ or structures using sliders, pivots and folds to produce	• Measuring, marking and checking the accuracy of the jelutong and dowel pieces required. • Measuring, marking and cutting components

	- they do not work as they should - to fit their vehicle design. - to improve how they work after testing their vehicle.	• Experimenting with linkages adjusting the widths, lengths and thicknesses of card used • Cutting and assembling components neatly	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, weaving		movement • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result	accurately using a ruler and scissors. • Assembling components accurately to make a stable frame. • Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles. • Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set.
	Evaluation - Skills					
	• Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed • Reviewing the success of a product by testing it with its intended audience • Testing mechanisms, identifying what stops wheels from turning, knowing • that a wheel needs an axle in order to move	• Evaluating different designs • Testing and adapting a design • Evaluating own designs against design criteria • Using peer feedback to modify a final design	• Using the views of others to improve designs • Testing and modifying the outcome, suggesting improvements • Understanding the purpose of exploded-diagrams through the eyes of a designer and their client.	• Evaluating the speed of a final product based on: the affect of shape on speed and the accuracy of workmanship on performance	• Suggesting points for improvement	• Evaluating the work of others and receiving feedback on own work • Applying points of improvements to their toys • Describing changes they would make/ do if they were to do the project again
	Technical knowledge					
	• To know that a mechanism is the parts of an object that move together. •To know that a slider	• To know that different materials have different properties and are therefore suitable for different uses.	• Understanding how pneumatic systems work • To understand how pneumatic systems work. • To understand that	• To know that air resistance is the level of drag on an object as it is forced through the air. • To understand that the	• To know that mechanisms control movement. • To understand that mechanisms can be used to change one kind of motion	• To understand that the mechanism in an automata uses a system of cams, axles and followers. • To understand that different

Key Assessment Questions	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. • To know that wheels need to be round to rotate and move. • To understand that for a wheel to move it must be attached to a rotating axle. • To know that an axle moves within an axle holder which is fixed to the vehicle or toy. • To know that the frame of a vehicle (chassis) needs to be balanced.	• 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.	pneumatic systems can be used as part of a mechanism. • To know that pneumatic systems operate by drawing in, releasing and compressing air.	shape of a moving object will affect how it moves due to air resistance.	into another. • To understand how to use sliders, pivots and folds to create paper-based mechanisms	shaped cams produce different outputs.
	Can I follow a design to create a moving model which uses sliders and levers? Can I identify whether it is a lever or slider and predict what the movement will be? Can I follow a design to create a moving model which uses wheels and an axel? Can I identify what makes a toy or vehicle roll forwards? Can I suggest improvements to my design and final product?	**Can I select and apply linkages?** **Can I cut and assemble components?** **Can I identify and explore wheel mechanisms?** **Can I test and adapt a design?** **Can I design a moving monster for a specific audience?** **Can I identify mechanisms in everyday objects?** **Can I explain that a level moves on a pivot and how this helps movement?**	Can I select materials according to their functional and aesthetic characteristics? Can I explain how pneumatic systems work? Can I suggest modifications to a design?	Can I explain and understand kinetic energy? Can I evaluate a final product based on shape and speed? Can I draw a net to create a structure?	Can I explain how mechanisms control movement? Can I name mechanisms, input and outputs accurately? Can I suggest points for improvement?	Why do we put components together in a particular order? Why is a bench hook useful? What is automata and how does a cam work? What is a design brief?

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Electrical systems	**Design - Skills**					
				• Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas	• 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	• 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
	Make - Skills					
				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	• 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.	• Constructing a stable base for an electromagnetic 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
	Evaluation - Skills					
				• Evaluating electrical products • Testing and evaluating the success of a final 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	• Testing own and others finished games, identifying what went well and making suggestions for improvement

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					in configuration positively or negatively affect an existing product.	
	Technical knowledge					
				• 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 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.	• To know that batteries contain acid, which can be dangerous if they leak. • To know the names of the components in a basic series circuit, including a buzzer. • To understand the diagram perspectives 'top view', 'side view' and 'back'.
Key Assessment Questions				Can I identify features of a torch, explaining how they work? Can I design a working electrical circuit? Can I evaluate an end product thinking of other ways it could have been achieved?	Can create a design criteria that clarifies the target user? Can I analyse a product by its purpose? Can I analyse a product by its strengths and weaknesses?	What is meant by 'form' over 'function' and why might it be a problem? Why is it better to have 'form follows function'? How can circuits be built and adapted to their purpose?
Cooking and Nutrition	**Design - Skills**					
	• Designing smoothie carton packaging by-hand or on ICT software	• Designing a healthy wrap based on a food combination which work well together	• Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish	• Designing a biscuit within a given budget, drawing upon previous taste testing judgements	• Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients • Writing an amended	• Writing a recipe, explaining the key steps, method and ingredients • Including facts and drawings from research undertaken

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					method for a recipe to incorporate the relevant changes to ingredients • Designing appealing packaging to reflect a recipe	
	Make - Skills					
	• Chopping fruit and vegetables safely to make a smoothie • Identifying if a food is a fruit or a vegetable • Learning where and how fruits and vegetables grow	• Slicing food safely using the bridge or claw grip • Constructing a wrap that meets a design brief	• Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination • Following the instructions within a recipe	• Following a baking recipe • Cooking safely, following basic hygiene rules • Adapting a recipe to improve it or change it to meet new criteria (e.g. from savoury to sweet).	• Cutting and preparing vegetables safely • Using equipment safely, including knives, hot pans and hobs • Knowing how to avoid cross contamination • Following a step by step method carefully to make a recipe	• Following a recipe, including using the correct quantities of each ingredient • Adapting a recipe based on research • Working to a given timescale • Working safely and hygienically with independence
	Evaluation - Skills					
	• Tasting and evaluating different food combinations • Describing appearance, smell and taste • Suggesting information to be included on packaging	• Describing the taste, texture and smell of fruit and vegetables • Taste testing food combinations and final products • Describing the information that should be included on a label • Evaluating which grip was most effective	• Establishing and using design criteria to help test and review dishes • Describing the benefits of seasonal fruits and vegetables and the impact on the environment • Suggesting points for improvement when making a seasonal tart	• Evaluating a recipe, considering: taste, smell, texture and appearance. • Describing the impact of the budget on the selection of ingredients. • Evaluating and comparing a range of food products. • Suggesting modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins).	• Identifying the nutritional differences between different products and recipes. • Identifying and describing healthy benefits of food groups.	• Evaluating a recipe, considering: taste, smell, texture and origin of the food group. • Taste testing and scoring final products. • Suggesting and writing up points of improvements when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process. • Evaluating health and safety in production to minimise cross contamination.
	Technical Knowledge					

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	• 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 'diet' means the food and drink that a person or animal usually eats. • To understand what makes a balanced diet. • To know where to find the nutritional information on packaging. • To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. • To understand that I should eat a range of different foods from each food group, and roughly how much of each food group. • To know that nutrients are substances in food that all living things need to make energy, grow and develop. • To know that 'ingredients' means the items in a mixture or recipe. • To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy. • To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'.	• 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.	• 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.	• 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	• To know that 'flavour' is how a food or drink tastes. • To know that many countries have 'national dishes' which are recipes associated with that country. • To know that 'processed food' means food that has been put through multiple changes in a factory. • To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. • To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork).

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Key Assessment Questions	Can I test and evaluate different food combinations? Can I describe and classify fruit and vegetables by taste and texture? Can I suggest information that should be on packaging?	Can I design a healthy wrap based on food combinations? Can I use equipment safely? Can I meet a design brief? Can I explain what makes a balanced diet?	Can I follow instructions within a recipe? Can I work safely and hygienically? Can I show how food is grown at certain seasons and how we can make better choices for the environment? Can I test the success of a product against the original design?	Can I design a biscuit within a given budget? Can I share information about the growing seasons and nutritional benefits of fruit and vegetables? Can I establish and use design criteria to help test and review dishes?	Can I explain where a variety of foods are from? Can I design appealing packaging to a design brief? Can I adapt a traditional recipe, considering the nutritional value?	What is needed to plan a healthy three course menu? How can we ensure our cooking is hygienic? How do chefs consider 'flavour' when designing dishes? What is a method in cooking?
Textiles	**Design - Skills**					
	• Using a template to create a design for a puppet	• Designing a pouch	• Designing and making a template from an existing cushion and applying individual design criteria	Writing design criteria for a product, articulating decisions made • Designing a personalised Book sleeve		
	Make - Skills					
	• Cutting fabric neatly with scissors • Using joining methods to decorate a puppet • Sequencing steps for construction	• Selecting and cutting fabrics for sewing • Decorating a pouch using fabric glue or running stitch • Threading a needle. • Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. • Neatly pinning and cutting fabric using a template.	• Following design criteria to create a cushion • Selecting and cutting fabrics with ease using fabric scissors • Sewing cross stitch to join fabric • Decorating fabric using appliqué • Completing design ideas with stuffing and sewing the edges	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, working neatly sewing small neat stitches • Incorporating fastening to a design		
	Evaluation - Skills					
	• Reflecting on a finished	• Troubleshooting scenarios	• Evaluating an end product	• Testing and evaluating an		

	product, explaining likes and dislikes	posed by teacher • Evaluating the quality of the stitching on others' work • Discussing as a class, the success of their stitching against the success criteria • Identifying aspects of their peers' work that they particularly like and why	and thinking of other ways in which to create similar items	end product against the original design criteria • Deciding how many of the criteria should be met for the product to be considered successful • Suggesting modifications for improvement • Articulating the advantages and disadvantages of different fastening types.		
	Technical 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 sewing is a method of joining fabric. • To know that different stitches can be used when sewing. • To understand the importance of tying a knot after sewing the final stitch. • To know that a thimble can be used to protect my fingers when sewing.	•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.	• To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro. • 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 Assessment Questions	Can I follow some design criteria? Can I cut neatly and safely? Can I use joining methods,	**Can I select and cut fabric for sewing?** **Can I evaluate the quality of stitching on other's work?**	Can I use different stitches to join fabric? Can I decorate my fabric? Can I design and make a	Can I join fabric using different stitches? Can I design and make a template?		

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Digital World	justifying my choice?	**I can explain what I like and why in my peer's work**	template?	Can I test an evaluate the success of a product taking inspiration from peers?		
	Design - Skills					
			Electronic Charm Problem solving by suggesting potential features on a Micro: bit and justifying my ideas. • Developing design ideas for a technology pouch. • Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge.		**Monitoring devices** • Researching (books, internet) for a particular (user's) animal's needs. • Developing design criteria based on research. • Generating multiple housing ideas using building bricks. • Understanding what a virtual model is and the pros and cons of traditional and CAD modelling. • Placing and manoeuvring 3D objects, using CAD. • Changing the properties of, or combining one or more 3D objects, using CAD.	**Navigating the world** • Writing a design brief from information submitted by a client. • Developing design criteria to fulfil the client's request. • Considering and suggesting additional functions for my navigation tool. • Developing a product idea through annotated sketches. • Placing and manoeuvring 3D objects, using CAD. • Changing the properties of, or combining one or more 3D objects, using CAD.
	Make - Skills					
			• Using a template when cutting and assembling the pouch. • Following a list of design requirements. • Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch.		• Understanding the functional and aesthetic properties of plastics. • Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range.	• Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo). • Explaining material choices and why they were chosen as part of a product concept. • Programming an N,E, S, W cardinal compass.

			• Applying functional features such as using foam to create soft buttons.			
	Evaluation - Skills					
			• Analysing and evaluating an existing product. • Identifying the key features of a pouch.		• Stating an event or fact from the last 100 years of plastic history. • Explaining how plastic is affecting planet Earth and suggesting ways to make more sustainable choices. • Explaining key functions in my program (audible alert, visuals). • Explaining how my product would be useful for an animal carer including programmed features.	• Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool. • Developing an awareness of sustainable design. • Identifying key industries that utilise 3D CAD modelling and explaining why. • Describing how the product concept fits the client's request and how it will benefit the customers. • Explaining the key functions in my program, including any additions. • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool. • Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch. • Demonstrating a functional program as part of a product concept pitch
	Technical knowledge					
			• To understand that, in programming, a 'loop' is code that repeats something again and again until stopped.		• To know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and	• To know that accelerometers can detect movement. • To understand that sensors can be useful in products as

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			• To know that a Micro:bit is a pocket-sized, codeable computer.		record. • To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose. • To understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met.	they mean the product can function without human input.
Key assessment Questions			Can I say what CAD stands for? Can I explain the functionality of my finish product? Can I follow design requirements using computer-aided design? Can I evaluate an end product?		Can I explain what conditional statements are? Can I explain what a sensor is for? Can I explain what a 'device' is? Can I explain the key functions of my device?	What do we mean by 'form'? What does 'multifunctional' mean? How can designers use a 'concept'? How are smart products helping our world?