EYFS

	Autumn Cooking and Nutrition: Soup	Spring Textiles: Bookmarks	Summer Structures: Junk Modelling
Lead Enquiry Question (Composite Outcome)	**What are the differences between fruit and vegetables (senses)?**	How can we use threading and weaving using different materials and objects?	How can different materials and structures be joined together?
Component Questions (components to be explored throughout the unit)	CQ1: How are fruits and vegetables different in texture, taste and appearance? CQ2: What do pumpkins look like, feel like, smell like and taste like? CQ3: What vegetables could go into a soup? CQ4: How can we slice and chop vegetables safely? CQ5: What words can we use to describe our soup?	CQ1: Can I weave materials and objects through different frames? CQ2: How can paper be woven with paper, through a base? CQ3: Can I thread wool through hessian fabric with a sewing needle and thread? CQ4: Can I say what I like and dislike about a design and product?	CQ1: What are the names of different craft tools that can used for junk modelling? CQ2: How can a range of scissors be used safely to cut different shapes and sizes? CQ3: How can we work together to generate ideas? CQ4: How can different materials and tools be used? CQ5: How can we use joins like glue, paper clips, tape etc?
EYFS Outcomes	**Communication and language:** Learn new vocabulary and use new vocabulary throughout the day. **ELG: Speaking:** Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary. **Personal, social and emotional development** Know and talk about the different factors that support their overall health and wellbeing: healthy eating. **ELG: Managing self:** Manage their own basic hygiene and personal needs, including...understanding the importance of healthy food choices. Understanding the world and explore the natural world around them. **ELG: The Natural World:** Explore the natural world around them, making observations and drawing pictures of animals and plants. **Characteristics of effective learning** > Playing and exploring	**Physical development** Develop their small motor skills so that they can use a range of tools competently, safely and confidently. **ELG: Fine Motor Skills:** Use a range of small tools, including scissors, paint brushes and cutlery. Expressive arts and design **ELG: Creating with materials:** Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. **Characteristics of effective learning** > Playing and exploring > Active learning	**Physical development** Develop small motor skills so that they can use a range of tools competently, safely and confidently. **ELG: Fine Motor Skills:** Use a range of small tools, including scissors, paint brushes and cutlery. **Expressive arts and design** Explore, use and refine a variety of artistic effects to express ideas and feelings. **ELG: Creating with Materials:** Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. **Characteristics of effective learning** >Playing and exploring. >Active learning.

Year One

	Autumn 1 Mechanisms: Making a Moving Story Book	Autumn 2 Textiles: Puppets	Spring 1 Structures: Constructing a Windmill
Lead Enquiry Question (Composite Outcome)	How do sliders work?	How can fabrics be joined together?	How do windmills work?
Component Questions (components to be explored throughout the unit)	CQ1: Can I explain mechanisms work and how can we make them? CQ2: How can a slider be used within a storybook? CQ3: How are moving pictures made? CQ4: How successful was my product and how could I improve it?	CQ1: What can be used to join two fabrics together? CQ2: How can I use a template to create my design? CQ3: How can I join two fabrics together effectively? CQ4: How can I embellish my design using joining methods?	CQ1: How can I create a stable structure? CQ2: Can tools and equipment be used accurately to make part of a structure? CQ3: How can I attach sails to a structure? CQ4: Can I evaluate a structure?
Vocabulary	sliders mechanism adapt design criteria design input model template assemble test	decorate design fabric glue model hand puppet safety pin staple stencil template	axle base centre equal evaluate middle rotate rotor rotor blades sails same stable strong structure
Assessment Checkpoint	Children who are **secure** will be able to: ✓ Identify whether a mechanism is a side-to-side slider or an up-and-down slider and determine	Children who are **secure** will be able to: ✓ Join fabrics together using pins, staples or glue.	Children who are **secure** will be able to: ✓ Follow design criteria to meet the needs of a user. ✓ Make a stable structure.

	what movement the mechanism will make. ✓ Clearly label drawings to show which parts of their design will move and in which direction. ✓ Make a picture, which meets the design criteria, with parts that move purposefully as planned. ✓ Evaluate the main strengths and weaknesses of their design and suggest alterations	✓ Design a puppet and use a template. ✓ Join their two puppets' faces together as one. ✓ Decorate a puppet to match their design	✓ Make functioning sails/blades that attach to the supporting structure. ✓ Improve their windmill.
	Spring 2 **Mechanisms: Wheels and Axles**	**Summer 1** **Cooking and Nutrition: Smoothies**	**Summer 2**
Lead Enquiry Question (Composite Outcome)	How do wheels and axles work on vehicles?	What are the differences between fruits and vegetables and how can we identify them?	
Component Questions (components to be explored throughout the unit)	CQ1: Can I explain how wheels move? CQ2: Can I identify what stops wheels from turning? CQ3: Can I design and build moving vehicle?	CQ1: How can we identify fruits? CQ2: Where do fruits and vegetables grow? CQ3: How can fruit be cut and juiced? CQ4: Can I select ingredients for a recipe, by testing flavours? CQ5: Can I prepare a smoothie, following a recipe? CQ6: Can a recipe be improved against my design brief?	
Vocabulary	axle axle holder chassis diagram dowel equipment mechanism wheel	blend blender chopping board compare cut design evaluate flavour fork	

		fruit healthy ingredients juice juicer	
Assessment Checkpoint	Children who are **secure** will be able to: ✓ Explain that wheels move because they are attached to an axle. ✓ Recognise that wheels and axles are used in everyday life, not just in cars. ✓ Identify and explain vehicle design flaws using the correct vocabulary. ✓ Design a vehicle that includes functioning wheels, axles and axle holders. ✓ Make a moving vehicle with working wheels and axles. ✓ Explain what must be changed if there are any operational issues.	Children who are **secure** will be able to: ✓ Describe fruits and vegetables and explain how to identify fruits. ✓ Name a range of places that fruits and vegetables grow. ✓ Describe basic characteristics of fruit and vegetables. ✓ Prepare fruits and vegetables to make a smoothie.	Children who are **secure** will be able to:

Year Two

	Autumn 1 Mechanisms: Fairground Wheel	Autumn 2 Structures: Baby Bear's Chair	Spring 1
Lead Enquiry Question (Composite Outcome)	How do components fit together so wheels can rotate and structures can stand freely?	How can structures be strengthened to improve stability?	
Component Questions (components to be explored throughout the unit)	CQ1: What are wheel mechanisms and how do they work? CQ2: Can I design a Ferris wheel and select appropriate materials to make it with? CQ3: How can I build and test a moving wheel? CQ4: Can I evaluate my structure and the quality of the rotating wheel?	CQ1: What are the features of different structures? CQ2: How can the shape of a structure affect its strength? CQ3: Can I make a structure according to a design criteria? CQ4: Can I produce a finish structure and evaluate its strength, stiffness and stability?	
Vocabulary	design design criteria wheel Ferris wheel pods axle axle holder frame mechanism	design criteria man-made natural properties structure stable shape model test	
Assessment Checkpoint	Children who are **secure** will be able to: ✓ Design and label a wheel. ✓ Consider the designs of others and make comments about their practicality or appeal. ✓ Consider the materials, shape, construction and mechanisms of their wheel. ✓ Label their designs. ✓ Build a stable structure with a rotating wheel. ✓ Test and adapt their designs as necessary.	Children who are **secure** will be able to: ✓ Identify man-made and natural structures. ✓ Identify stable and unstable structural shapes. ✓ Contribute to discussions. ✓ Identify features that make a chair stable. ✓ Work independently to make a stable structure, following a demonstration.	

	✓ Follow a design plan to make a completed model of the wheel. ✓	✓ Explain how their ideas would be suitable for Baby Bear. ✓ Produce a model that supports a teddy, using the appropriate materials and construction techniques. ✓ Explain how they made their model strong, stiff and stable ✓	
	Spring 2 **Cooking and Nutrition: Balanced Diet**	**Summer 1** **Mechanisms: Making a Moving Animal**	**Summer 2** **Textiles: Pouches**
Lead Enquiry Question (Composite Outcome)	What is a balanced diet? Can we create a tasty, healthy wrap?	How can levers, linkages and pivots be used to assemble a moving animal?	How can a running stitch be used to design, make and decorate a pouch?
Component Questions (components to be explored throughout the unit)	CQ1: Can I recognise food and name their food groups? CQ2: Can I identify the balance of food groups in a meal? CQ3: Can I choose the most appropriate equipment to prepare food? CQ3: Can I select balanced combinations of ingredients? CQ5: Can I design a recipe, based on a set of criteria? CQ6: Can I evaluate a dish based on design criteria?	CQ1: Can I look at objects and explain how they move using pivots, levers and linkages? CQ2: Can I make a linkage and explain how it helps a product to move? CQ3: Can I design and make a product and include different ways of making it move?	CQ1: Can I sew a running stitch? CQ2: Can I use a template? CQ3: How can we join two fabrics together using a running stitch? CQ4: Can I decorate a pouch using fabric glue or stitching?
Vocabulary	appearance balanced carbohydrates chopping board combination cut dairy design design brief diet evaluate	axle design criteria input linkage mechanical output pivot wheel	decorate fabric fabric glue knot needle needle threader running stitch sew template thread

	feel fruit grate		
Assessment Checkpoint	Children who are **secure** will be able to: ✓ Name the main food groups and identify foods that belong to each group. ✓ Describe the taste, feel and smell of a given food. ✓ Think of three different wrap ideas, considering flavour combinations. ✓ Construct a wrap that meets the design brief and their plan.	Children who are **secure** will be able to: ✓ Identify the correct terms for levers, linkages and pivots. ✓ Analyse popular toys with the correct terminology. ✓ Create functional linkages that produce the desired input and output motions. ✓ Design monsters suitable for children, which satisfy most of the design criteria. ✓ Evaluate their two designs against the design criteria, using this information and the feedback of their peers to choose their best design. ✓ Select and assemble materials to create their planned monster features. ✓ Assemble the monster to their linkages without affecting their functionality.	Children who are **secure** will be able to: ✓ Sew a running stitch with regular-sized stitches and understand that both ends must be knotted. ✓ Prepare and cut fabric to make a pouch from a template. ✓ Use a running stitch to join the two pieces of fabric together. ✓ Decorate their pouch using the materials provided.

Year Three

	Autumn 1 Structures: Constructing a Castle	Autumn 2 Mechanical Systems: Pneumatic Toys	Spring 1 Digital World: Wearable Technology
Lead Enquiry Question (Composite Outcome)	What are the key features of a castle and can I design and make castle, using recycled materials?	What is a pneumatic system?	What is a micro:bit and how are they programmed?
Component Questions (components to be explored throughout the unit)	CQ1: How are 2d and 3d shapes combined to form a strong and stable structure? CQ2: Can I design a castle using the key features? CQ3: How are constructions made using a 3d net? CQ4: How can a product be evaluated and improved?	CQ1: How do pneumatic systems work? CQ2: Can I design and create a toy with a pneumatic system? CQ3: Can I test and finalise ideas against a design criteria?	CQ1: What wearable technology exists and how effective is it? CQ2: Can I develop a design criteria for a light up wearable? CQ3: Can I use a code to program and control a product? CQ4: How can a product concept develop and communicate ideas? CQ5: How can computer-aided design be used in a display? CQ6: How can feedback be used to improve a design?
Vocabulary	2D 3D castle design key features net scoring shape stable stiff strong structure tab	mechanism lever pivot linkage system pneumatic system input output component thumbnail sketch research adapt properties reinforce motion	analogue analyse annotate badge computer-aided design (CAD) control design criteria develop digital digital revolution digital world display electronic electronic products fastening feature feedback form function

			initiate layers monitor net opinion point of sale product product design program sense simulator smart technology test user
Assessment Checkpoint	Children who are secure will be able to: ✓ 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. ✓ Use glue to securely assemble geometric shapes. ✓ Utilise skills to build a complex structure from simple geometric shapes. ✓ Evaluate their work by answering simple questions	Children who are secure will be able to: ✓ Draw accurate diagrams with correct labels, arrows and explanations. ✓ Correctly identify definitions for key terms. ✓ Identify five appropriate design criteria. ✓ Communicate two ideas using thumbnail sketches. ✓ Communicate and develop one idea using an exploded diagram. ✓ Select appropriate equipment and materials to build a working pneumatic system. ✓ Assemble their pneumatic system within the housing to create the desired motion. ✓ Create a finished pneumatic toy that fulfills the design brief.	Children who are secure will be able to: ✓ Give a brief explanation of the digital revolution and/or remember key examples. ✓ Suggest a feature from the virtual micro:bit that is suitable for the product. ✓ Write a program that initiates a flashing LED panel, or another pattern, on the virtual micro:bit when a button is pressed. ✓ Identify errors, if testing is unsuccessful, by comparing their code to a correct example. ✓ Explain the basic functionality of their finished program. ✓ Suggest key features for a way to attach the product to the user, with some consideration for the overall theme and the user. ✓ Create annotated diagrams to help illustrate how their product is worn. ✓ Describe what is meant by 'point of sale display' with an example. ✓ Follow basic design requirements using computer-aided design, drawing at least one shape with a

			text box and bright colours, following a demonstration. ✓ Evaluate their design using a focus group.
	Spring 2 **Textiles: Cross Stitch and Applique (Egyptian Collars)**	**Summer 1** **Cooking and Nutrition: Eating Seasonally**	**Summer 2** **Electrical Systems: Electric Poster**
Lead Enquiry Question (Composite Outcome)	How can a cross-stitch and applique design be used to design and assemble an Egyptian Collar?	What are season fruits and vegetables? How do they positively affect the environment?	How can a simple circuit be used on an electrical poster?
Component Questions (components to be explored throughout the unit)	CQ1: Can I sew cross-stitch and use applique? CQ2: Can I use a template to design an Egyptian Collar? CQ3: How can fabric parts be assembled into a fabric product? CQ4: How can applique and cross-stitch be used to improve a product?	CQ1: Where does food come from around the world? CQ2: What are the benefits of eating seasonal food? CQ3: How can we prepare food using cutting and peeling? CQ4: Can I evaluate seasonal ingredients?	CQ1: What is the purpose of information design? CQ2: How can we use research to develop a range of initial ideas? CQ3: How can initial ideas develop into a final design? CQ4: How can I assemble a final product and incorporate a simple circuit?
Vocabulary	appliqué cross-stitch fabric running stitch patch thread embellish template cotton silk polyester wrinkle tear water-resistant breathable matt shiny biodegrade pinking	appearance arid climate complementary country cut design evaluate export fruit grate import ingredients Mediterranean mock-up mountain peel polar seasonal seasons snip	information design design public design criteria research initial ideas sketch bulb self assessment peer assessment feedback develop final design electrical system electric product circuit circuit component bulb battery crocodile wires

		taste temperate texture tropical vegetable weather	
Assessment Checkpoint	Children who are secure will be able to: ✓ Demonstrate their ability to use cross-stitch as a decorative feature or to join two pieces of fabric together. ✓ Develop appliqué designs based on design criteria. ✓ Design, cut and shape their template for an usekh/wesekh collar, with increasing accuracy. ✓ Decorate their Egyptian collar using a variety of techniques such as appliqué, cross-stitch, beads, buttons and pinking. ✓ Measure and attach a ribbon with a running stitch. ✓ Recognise different types and qualities of fabrics. ✓ Explain the aesthetic and/or functional properties of some of their material choices.	Children who are secure will be able to: ✓ Explain that fruits and vegetables grow in different countries based on their climates. ✓ Understand that seasonal fruits and vegetables grow in a given season. ✓ Understand that eating seasonal fruit and vegetables positively affects the environment. ✓ Design a tart recipe using seasonal ingredients.	Children who are secure will be able to: ✓ Explain what 'information design' is and understand its impact, considering what could happen if we had no signage, posters, or written communication in public places of interest. ✓ Research and choose a specific Ancient Roman topic on which to base their initial poster ideas. ✓ Complete design criteria based on a client's request. ✓ Roughly sketch four initial poster ideas, indicating where a bulb will be located for each. ✓ Review their initial ideas against the design criteria and peer feedback, developing a final design. ✓ Assemble an electric poster, including a functional simple circuit with a bulb, following a demonstration. ✓ Acknowledge, with a brief explanation, the need to mount the poster using corrugated card. ✓ Test that the simple circuit works by adding a battery. ✓ Evaluate their electric posters in a letter to a client.

Year Four

	Autumn 1 Mechanical Systems: Making a Slingshot Car (Roman Weapon)	Autumn 2 Textiles: Fastenings (European Culture)	Spring 1 Cooking and Nutrition: Adapting a Recipe
Lead Enquiry Question (Composite Outcome)	What is a slingshot mechanism and how could they be used to make a car?	How can fastenings be used?	How can a recipe be adapted to suit a target audience?
Component Questions (components to be explored throughout the unit)	CQ1: Can I build a chassis and launch mechanism? CQ2: How does the shape of a car body reduce air resistance? CQ3: Can I make a model based on a chosen design? CQ4: Can I assemble and test a completed product?	CQ1: What are the advantages and disadvantages of different fastenings? CQ2: Can I design a book sleeve to meet a design criteria? CQ3: How can a test paper template be used to help prepare the product? CQ4: Can I assembly a book jacket	CQ1: How can we evaluate existing products? CQ2: Can I prepare and cook a dish to help me create my own recipe? CQ3: Can I select ingredients and follow a budget? CQ4: How can I use existing products to inspire a recipe? CQ5: How can market research be used to test a prototype biscuit? CQ6: How can we evaluate a final product?
Vocabulary	chassis energy kinetic mechanism air resistance design structure graphics research model template	Criteria Fabric Fastening Fix Mock-up Stitch Template	adapt addition appearance budget buttery combine comment compare construct crunchy hygiene market research modify multiplication opinion pounds sieve sift

			target audience taste texture
Assessment Checkpoint	Children who are secure will be able to: ✓ Work independently to produce an accurate, functioning car chassis. ✓ Design a shape that is suitable for the project. ✓ Attempt to reduce air resistance through the design of the shape. ✓ Produce panels that will fit the chassis and can be assembled effectively using the tabs they have designed. ✓ Construct car bodies effectively. ✓ Conduct a trial accurately and draw conclusions and improvements from the results.	Children who are secure will be able to: ✓ Identify the features, benefits and disadvantages of a range of fastening types. ✓ Write design criteria and design a sleeve that satisfies the criteria. ✓ Make a template for their book sleeve. ✓ Assemble their case using any stitch they are comfortable with.	Children who are secure will be able to: ✓ Describe features of biscuits using taste, texture and appearance. ✓ Follow a recipe with support. ✓ Use a budget to plan a recipe. ✓ Adapt a recipe using additional ingredients
	Spring 2 **Digital World: Mindful Moments Timer**	**Summer 1** **Structures: Pavilions** **(Tintagel Castle Layout)**	**Summer 2** **Electrical Systems: Torches**
Lead Enquiry Question (Composite Outcome)	How can micro:bits be used to make a timer?	How can a model frame structure be used to improve stability?	What is the difference between electrical and electronic products?
Component Questions (components to be explored throughout the unit)	CQ1: What existing timer products are already out there? CQ2: Can I develop a design criteria for a user? CQ3: Can I create programme a product to control it? CQ4: Can I create a prototype to develop and communicate ideas?	CQ1: How can structures differ in shape? CQ2: Can I use my knowledge of structures to design a pavilion? CQ3: How can cladding be added to a frame structure, to create a Pavilion?	CQ1: How do electrical items work? CQ2: Can I analyse and evaluate electrical products? CQ3: How can product be designed to fit a set of specific user needs? CQ4: Can I make and evaluate a torch?

	CQ5: How are ideas developed through computer-aided design? CQ6: How can we consider and evaluate feedback?		
Vocabulary	advantage annotate assemble aesthetic block brand brand identity bug computer-aided design (CAD) clipart coding criteria debug design develop disadvantage ergonomic exhibition function logo mindfulness program prototype research script timer variable	3D shapes Cladding Design criteria Innovative Natural Reinforce Structure	battery bulb buzzer conductor circuit circuit diagram electricity insulator series circuit switch component design design criteria diagram evaluation LED target audience input recyclable theme aesthetics assemble equipment ingredients packaging properties
Assessment Checkpoint	Children who are secure will be able to: ✓ State and/or describe the advantages and disadvantages of existing products (timers). ✓ Understand how virtual micro:bit features could be used as part of a design idea. ✓ Use research to inform design criteria. ✓ Write a program that displays a timer on the virtual micro:bit	Children who are secure will be able to: ✓ Produce a range of free-standing frame structures of different shapes and sizes. ✓ Design a pavilion that is strong, stable and aesthetically pleasing. ✓ Select appropriate materials and construction techniques to create a stable, free-standing frame structure.	Children who are secure will be able to: ✓ Identify electrical products and explain why they are useful. ✓ Help to make a working switch. ✓ Identify the features of a torch and how it works. ✓ Describe what makes a torch successful. ✓ Create suitable designs that fit the success criteria and their own design criteria.

	based on their chosen seconds/minutes. ✓ Suggest where the errors are, if testing is unsuccessful, by comparing the correct code to their own. ✓ State key functions in the program editor (e.g. loops). ✓ Evaluate the immediate appeal of the virtual micro:bit timer and how it might function. ✓ Express which stages of the project they enjoyed or found more challenging. ✓ Explain the need for a company to stand out against competition and/or state the importance of logos in business. ✓ Recall and describe the name and use of key tools used in Sketchpad (CAD) software. ✓ Fulfil the design requirements of the logo. ✓ Evaluate the product using feedback from the user.	✓ Select appropriate materials and techniques to add cladding to their pavilion.	✓ Create a functioning torch with a switch according to their design criteria.

Year Five

	Autumn 1 Cooking and Nutrition: Developing a Recipe (Linked to rainforests and food sourced there/ Fair Trade)	Autumn 2 Electrical Systems: Doodlers	Spring 1 Textiles: Stuffed Toys
Lead Enquiry Question (Composite Outcome)	How can a recipe be adapted to improve nutritional content?	How can motors be used within a circuit?	How can materials, decorations, attachments and a blanket stitch be used to create a stuffed toy?
Component Questions (components to be explored throughout the unit)	CQ1: How are ingredients reared and processed? CQ2: How can recipes be adapted? CQ3: What does the label on a product tell us about nutritional content? CQ4:How can food be prepared safely by following the colour system? CQ5: What can we use to design a product label?	CQ1: How are motors used in electrical products? CQ2: Why is evaluating important to help us understand the factors that affect the product's form and function? CQ3: How do we apply the findings from research to develop a unique product? CQ4: How are DIY kits used to help people assemble a product?	CQ1: How are toys designed using main component shapes? CQ2: How can a blanket stitch be used to join two pieces of fabric together? CQ3: How can appendages be used to add decorations to a fabric?
Vocabulary	beef brand cross-contamination enhance equipment grate hygiene ingredients label measure nutrient nutrition nutritional value preference press process recipe theme	circuit component configuration current develop DIY investigate motor motorised problem solve product analysis series circuit stable target user	accurate annotate appendage blanket-stitch design criteria detail evaluation fabric sew shape stuffed toy stuffing template

Assessment Checkpoint	Children who are secure will be able to: ✓ Describe the process of beef production. ✓ Research a traditional recipe and make changes to it. ✓ Add nutritional value to a recipe by selecting ingredients. ✓ Prepare and cook a version of bolognese sauce.	Children who are secure will be able to: ✓ Identify simple circuit components (battery, bulb and switch) with a basic explanation of their function. ✓ Explain that a series circuit is assembled in a loop to allow the electricity to flow along one path. ✓ Describe a motor as a circuit component that changes electrical energy into movement. ✓ Provide examples of motorised products that use movement to rotate or spin different parts. ✓ Remove and replace different parts of a Doodler, as part of a team. ✓ Suggest ways to switch the configuration to amend the form or function of the Doodler. ✓ Explain, in an investigation report, each of the changes they made and the effect this had on the Doodler's ability to draw scribbles (function) and appearance (form). ✓ Develop design criteria with consideration for the target user, the purpose of their Doodler, a key function and the Doodler's form and final appearance (e.g. fun, bright, soft). ✓ Explain simply why their Doodler has a certain configuration based on the findings of their investigation (e.g. I used four pens because the Doodler would fall over with two). ✓ Create a functional Doodler that creates scribbles on paper with or without a switch. ✓ Identify and list each of the required materials, tools and	Children who are secure will be able to: ✓ Design a stuffed toy, considering the main component shapes of their toy. ✓ Create an appropriate template for their stuffed toy. ✓ Join two pieces of fabric using a blanket stitch. ✓ Neatly cut out their fabric. ✓ Use appliqué or decorative stitching to decorate the front of their stuffed toy. ✓ Use blanket stitch to assemble their stuffed toy, repairing when needed. ✓ Identify what worked well and areas for improvement.

		circuit components required to build a Doodler. ✓ Explain simply the steps to assemble a Doodler as part of a set of instructions (or storyboard). ✓ Write instructions to build a functional circuit, explaining how to identify if it is functional or not. ✓ Provide suggestions to improve a peer's set of instructions after testing how effective they are at guiding someone.	
	Spring 2 **Digital World: Monitoring Devices**	**Summer 1** **Structures: Bridges**	**Summer 2** **Mechanical Systems: Making a Pop-Up Book**
Lead Enquiry Question (Composite Outcome)	What is Tinkercad interface and how can the be used?	What makes a bridge effective in terms of strength and stability?	How can paper-based mechanisms be used to design a storybook?
Component Questions (components to be explored throughout the unit)	CQ1: What is a monitoring device and how are they used? CQ2: How can we write a program to monitor the ambient temperature, including an alert? CQ3: Can I generate a creative and unique micro:bit case, stand or housing device? CQ4: Which skills are needed to create a 3D CAD?	CQ1: How can a beam be used within a structure to improve its strength? CQ2: What is a spaghetti truss bridge and how are they built? CQ3: Can I use my spaghetti design to build a wooden truss bridge? CQ4: How can a truss bridge be reinforced and evaluated?	CQ1: How can a design brief be used to make a pop up book? CQ2: How can layers and spacers be used to cover the working of mechanisms? CQ3: Can I create a high-quality product suitable for a target user?
Vocabulary	electronic sensor thermoscope thermometer research design brief design criteria development inventor	beam bridge arch bridge truss bridge strength technique corrugation lamination stiffness rigid	design input motion mechanism criteria research reinforce model

	vivarium programming loop programming comment alert ambient boolean duplicate value variable sustainability decompose plastic pollution man-made synthetic molecules reformed moulded transparent opaque versatile lightweight durable consumables CAD Tinkercad workplane	factors stability visual appeal aesthetics joints mark out hardwood softwood wood file/rasp sandpaper/glasspaper bench hook/vice tenon saw/coping saw assemble material properties reinforce wood sourcing evaluate quality of finish accuracy	
Assessment Checkpoint	Children who are secure will be able to: ✓ Describe what is meant by monitoring devices and provide an example. ✓ Explain briefly the development of thermometers from thermoscopes to digital thermometers. ✓ Research a chosen animal's key information to develop a list of design criteria for an animal monitoring device. ✓ Write a program that monitors the ambient temperature and alerts someone when the temperature moves from a specified range.	Children who are secure will be able to: ✓ Identify stronger and weaker shapes. ✓ Recognise that supporting shapes can help increase the strength of a bridge, allowing it to hold more weight. ✓ Identify beam, arch and truss bridges and describe their differences. ✓ Use triangles to create simple truss bridges that support a load (weight). ✓ Cut beams to the correct size, using a cutting mat. ✓ Smooth down any rough-cut edges with sandpaper.	Children who are secure will be able to: ✓ Produce a suitable plan for each page of their book. ✓ Produce the structure of the book. ✓ Assemble the components necessary for all their structures/mechanisms. ✓ Hide the mechanical elements with more layers using spacers where needed. ✓ Use a range of mechanisms and structures to illustrate their story and make it interactive for the users. ✓ Use appropriate materials and captions to illustrate the story

	✓ Identify errors (bugs) in the code and ways to fix (debug) them. ✓ State one or two facts about the history and development of plastic, including how it is now affecting planet Earth. ✓ Build a variety of brick models to invent Micro:bit case, housing and stand ideas, evaluating the success of their favourite model. ✓ Explain key pros and cons of virtual modelling vs physical modelling. ✓ Recall and describe the name and use of key tools used in Tinkercad (CAD) software.	✓ Follow each stage of the truss bridge creation as instructed by their teacher. ✓ Complete a bridge, with varying ranges of accuracy and finish, supported by the teacher. ✓ Identify some areas for improvement, reinforcing their bridges as necessary.	

Year Six

	Autumn 1 Mechanical Systems: Automata Toys	Autumn 2 Electrical Systems: Steady Hand Game	Spring 1 Structures: Playgrounds
Lead Enquiry Question (Composite Outcome)	What are cams, followers and axle mechanisms? How can they be used to mimic different movements?	What is a 'fit for purpose' design? How can a series circuit, housing and backboard be used to design a game?	How can research be used to used to help design a product and to meet a list of specified design criteria?
Component Questions (components to be explored throughout the unit)	CQ1: How can wood be prepared for assembly, by measuring, marking and cutting? CQ2: How can an exploded diagram be used to assemble an automata frame? CQ3: What is the relationship between cam profiles and follower movement? CQ4: How can housing and finishing touches be applied to an automata frame?	CQ1: How can research be used to inform designs? CQ2: What makes a 'stable base'? CQ3: How can electronics be assembled to produce an electronic game?	CQ1: What structures can be used to design a playground? CQ2: How can these structures be created? CQ3: How can they be improved?
Vocabulary	accurate assembly-diagram automata bench hook cam clamp component dowel drill bits exploded-diagram follower frame function hand drill jelutong linkage mark out measure	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	apparatus design criteria equipment playground landscape features cladding

	mechanism model research right-angle set square tenon saw	function gross motor skills insulator LED user	
Assessment Checkpoint	Children who are secure will be able to: ✓ Mark, saw and cut out the components and supports of their toy with a varying degree of accuracy to the intended measurements. ✓ Follow health and safety rules, taking care with the equipment. ✓ Attempt a partial assembly of their toys using an exploded-diagram, following a teacher's demonstration. ✓ Develop a design idea with some descriptive notes. ✓ Explore different cam profiles and choose three for their follower toppers with an explanation of their choices. ✓ Create neat, decorated follower toppers with some accuracy. ✓ Measure and cut panels that fit with some inaccuracies to conceal the inner workings of the automata. ✓ Decorate and finish the automata to meet the design criteria and brief. ✓ Evaluate their finished product, making descriptive and reflective points on function and form.	Children who are secure will be able to: ✓ Explain simply what is meant by 'form' (the shape of a product) and 'function' (how a product works). ✓ State what they like or dislike about an existing children's toy and why. ✓ Learn about skills developed through play and apply this knowledge in a survey of one or more children's toys. ✓ Identify the components of a steady hand game. ✓ Design a steady hand game of their own according to their design criteria, using four different perspective drawings. ✓ Create a secure base for their game, with neat edges, that relates to their design. ✓ Make and test a functioning circuit and assemble it within a case.	Children who are secure will be able to: ✓ Create five apparatus designs, applying the design criteria to their work. ✓ Make suitable changes to their work after peer evaluation. ✓ Make roughly three different structures from their plans using the materials available. ✓ Complete their structures, improving the quality of their rough versions and applying some cladding to a few areas. ✓ Secure their apparatus to a base. ✓ Make a range of landscape features using a variety of materials which will enhance their apparatus.

	Spring 2 Textiles: Waistcoats	Summer 1 Digital World: Navigating the World	Summer 2 Cooking and Nutrition: Come Dine with Me
Lead Enquiry Question (Composite Outcome)	How can a combination of textiles skills be used to decorate a waistcoat for a chosen purpose?	How can a navigation tool be produced using CAD 3D modelling software?	What are the basic tastes and complementary flavours?
Component Questions (components to be explored throughout the unit)	CQ1: How is fabric prepared? CQ2: How is fabric assembled? CQ3: How can a product be embellished using fastenings, applique and decorative stitches?	CQ1: What is a design brief and how can it be created based on a client request? CQ2: What must a program include to have multiple functions, as part of a navigation device? CQ3: How can a sustainable product concept be designed? CQ4: How can 3D CAD skills be used to produce a virtual model? CQ5: What is a product pitch?	CQ1: Can I research, design and prepare a 3 course meal using my culinary skills and knowledge?
Vocabulary	annotate decorate design criteria fabric target customer waistcoat waterproof	pedometer GPS tracker design brief design criteria client function program duplicate replica loop variable value if statement boolean corrode mouldable lightweight sustainable design environmentally friendly biodegradable recyclable product lifecycle product lifespan	balance bitter bridge method complement cookbook cross-contamination enhance equipment farm to fork flavours ingredients method research pairing recipe preparation salty sour storyboard sweet umami

Assessment Checkpoint	Children who are secure will be able to: ✓ Consider a range of factors in their design criteria and use this to create a waistcoat design. ✓ Use a template to mark and cut out a design. ✓ Use a running stitch to join fabric to make a functional waistcoat. ✓ Attach a secure fastening, as well as decorative objects. ✓ Evaluate their final product.	Children who are secure will be able to: ✓ Incorporate key information from a client's design request such as 'multifunctional' and 'compact' in their design brief. ✓ Write a program that displays an arrow to indicate cardinal compass directions with an 'On start' loading screen. ✓ Identify errors (bugs) in the code and suggest ways to fix (debug) them. ✓ Self and peer evaluate a product concept against a list of design criteria with basic statements. ✓ Identify key industries that use 3D CAD modelling and why. ✓ Recall and describe the name and use of key tools used in Tinkercad (CAD) software. ✓ Combine more than one object to develop a finished 3D CAD model in Tinkercad. ✓ Complete a product pitch plan that includes key information.	Children who are secure will be able to: ✓ Find a suitable recipe for their course. ✓ Record the relevant ingredients and equipment needed. ✓ Follow a recipe, including using the correct quantities of each ingredient. ✓ Write a recipe, explaining the process taken. ✓ Explain where certain key foods come from before they appear on the supermarket shelf.