Year 5 – Autumn 1			
DT: Digital worlds – Monitoring devices Big question: How can we design and program a monitoring device that helps care for an animal?			
Prior learning: • Year 4 – Mindful moment timer **Future learning:** • Year 6 – Navigating the world	**Knowledge:** • A **device** means equipment created for a certain purpose or job and that monitoring devices observe and record. • A sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose. • Conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met.	**Skills:** • Researching (books or internet) for a particular 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 object using CAD. • Understanding the functional and aesthetic properties of plastics.	**Vocabulary:** CAD design brief design criteria device electronic group loop model monitor monitoring device plastic

		• Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature moves out of a specified range. • Stating an event or fact from the last 100 years of plastic history. • Explaining how plastic affects planet Earth and suggesting ways to make more sustainable choices. • Explaining key functions in their program (audible alert or visuals). • Explaining how the product's programmed features would be useful for an animal carer.	plastic pollution programming comment sensor sustainability synthetic thermometer Tinkercad ungroup value variable versatile workplane
Critical Content Statements: • Monitoring devices observe and record data for a specific purpose. • Sensors detect changes and trigger responses.		**Common Misconceptions Pupils May Have:** • Thinking thermometers work the same way as sensors in all cases. • Believing monitoring devices only display data and cannot trigger alerts.	

• Conditional statements allow programs to respond to specific conditions. • CAD software helps create accurate virtual models for design. • Programming a micro:bit can monitor temperature and trigger alerts. • Plastic is versatile but has environmental impacts; sustainable choices are important. • Prototypes and models help test ideas before final production. • Feedback and evaluation improve design and functionality.	• Assuming CAD modelling is always better than physical modelling. • Thinking conditional statements are optional in programming. • Believing plastic is harmless to the environment. • Assuming feedback is not necessary for improving designs.

Year 5 – Spring 1			
DT: Electrical systems – Doodlers Big question: How can we design and build a motorised product that uses a series circuit to create movement?			
Prior learning: • Year 4 - Torches **Future learning:**	**Knowledge:**	**Skills:** • Identifying factors that could be changed on existing products and explaining how	**Vocabulary:** accurate

• Year 6 – Steady Hand Game	• 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 product analysis is critiquing the strengths and weaknesses of a product. • To know that 'configuration' means how the parts of a product are arranged.	these would alter the form and function of the product. • Developing design criteria based on findings from investigating existing products. • Developing design criteria that clarifies the target user. • Altering a product's form and function by tinkering with its configuration. • Making a functional series circuit, incorporating a motor. • Constructing a product with consideration for the design criteria. • Breaking down the construction process into steps so that others can make the product. • Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. • Determining which parts of a product affect its function and which parts affect its form.	annotate appendage blanket-stitch design criteria detail evaluation fabric sew shape stuffed toy stuffing template

		• Analysing whether changes in configuration positively or negatively affect an existing product. • Peer evaluating a set of instructions to build a product.	
Critical Content Statements: • A series circuit allows electricity to flow in one direction only. • A break in a series circuit stops all components from working. • Electric motors convert electrical energy into rotational movement. • Motorised products use motors to create movement. • Configuration affects both the form and function of a product. • Design criteria guide decisions to meet user needs and functionality. • Testing and evaluating ensures the product works as intended. • Product analysis helps identify improvements for future designs.		**Common Misconceptions Pupils May Have:** • Thinking series circuits can run in multiple directions. • Believing a motor will work without a complete circuit. • Assuming adding more wires improves performance. • Thinking decoration affects how well the motor works. • Believing configuration changes do not affect function. • Assuming testing is unnecessary once the product is built.	

Year 5 – Spring 2

DT: Develop a recipe

Big question: How can we develop a recipe that is nutritious, appealing, and meets dietary needs?

Prior learning:	**Knowledge:**	**Skills:**	**Vocabulary:**
• Cooking and Nutrition – Adapt a recipe in Year 4 **Future learning:** • Cooking and Nutrition - Come dine with me in Year 6	• 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.	• Explaining the farm-to-fork process. • Researching existing recipes. • Suggesting alternative ingredients. • Analysing nutritional content. • Writing an alternative recipe. • Understanding cross-contamination. • Using preparation skills. • Designing a jar label.	beef brand cook cross-contamination cut design enhance equipment evaluate farm grate hygiene ingredients label

<table>
<tr><td></td><td></td><td>Making a developed recipe.</td><td>measure
nutrient
nutrition
nutritional value
preference
press
process
recipe
safety
theme</td></tr>
<tr><td colspan="2">Critical Content Statements:
Beef comes from cows reared on farms as part of the farm-to-fork process.
Recipes can be adapted to improve nutritional value and meet dietary needs.
Nutritional information on packaging helps make informed choices.</td><td colspan="2">Common Misconceptions Pupils May Have:
Thinking beef comes from supermarkets rather than farms.
Believing the farm-to-fork process is not important for food safety.
Assuming all recipes are healthy without checking nutritional content.
Thinking cross-contamination rules are optional.</td></tr>
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• Cross-contamination can be prevented by using coloured chopping boards and following hygiene rules. • Adding vegetables and lean proteins can enhance nutritional value. • Cooking techniques such as peeling, cutting, and grating are essential for preparation. • Designing packaging (e.g., jar labels) makes products appealing and informative. • Evaluating recipes ensures they meet health, taste, and design criteria.	• Believing appearance is more important than taste and nutrition. • Assuming adapting a recipe means completely changing it rather than improving it.

Year 5 – Summer 1			
DT: Structures – Bridges Big question: How can we design and build a bridge that is strong, stable, and able to support weight?			
Prior learning:	**Knowledge:**	**Skills:**	**Vocabulary:**

• Year 2 – Baby bears chair • Year 4 - Pavilions **Future learning:** • Year 6 – Playgrounds	• 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 their properties. • To understand the material (functional and aesthetic) properties of wood.	• Designing a stable structure that is able to support weight. • Creating a frame structure with focus on triangulation. • Making a range of different shaped beam bridges. • Using triangles to create truss bridges that span a given distance and support a load. • Building a wooden bridge structure. • Independently measuring and marking wood accurately. • Selecting appropriate tools and equipment for particular tasks.	accuracy aesthetics arch bridge assemble beam bridge bench hook/vice corrugation evaluate factors hardwood joints lamination mark out material properties quality of finish reinforce rigid

		• Using the correct techniques to saw safely. • Identifying where a structure needs reinforcement and using card corners for support. • Explaining why selecting appropriate materials is an important part of the design process. • Understanding basic wood functional properties. • 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.	sandpaper/glasspaper softwood stability stiffness strength technique tenon saw/coping saw truss bridge visual appeal wood file/rasp wood sourcing

Critical Content Statements: • Triangles are strong shapes used to reinforce structures. • Beam, arch, and truss bridges have different designs and strengths. • Material properties affect strength, rigidity, and aesthetics. • Accurate measuring and cutting improve stability and finish. • Reinforcing corners and joints increases strength. • Design criteria guide decisions about function and appearance. • Testing bridges under load helps identify weaknesses. • Evaluating and improving designs ensures safety and durability.		**Common Misconceptions Pupils May Have:** • Thinking adding more glue or tape automatically makes a bridge stronger. • Believing aesthetics are more important than structural strength. • Assuming all shapes provide equal strength. • Thinking material choice does not affect performance. • Believing reinforcement is unnecessary for small structures. • Assuming testing is not needed once the bridge is built.	

Year 5 – Summer 2

DT: Mechanical systems – Pop up book

Big question: How can we design and make a pop-up book that uses mechanisms to bring a story to life?

Prior learning:	**Knowledge:**	**Skills:**	**Vocabulary:**
• Year 1 – Moving story books • Year 1 – Wheels and axles • Year 1 - Windmill • Year 2 – Moving monster • Year 2 – Fairground • Year 3 – Pneumatic systems • Year 4 – Slingshot car **Future learning:** • Year 6 – Automata toys	• To know that mechanisms control movement. • To understand that mechanisms can be used to change one kind of motion into another. • To understand how to use sliders, pivots and folds to create paper-based mechanisms. • To know that a design brief is a description of what I am going to design and make. • To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.	• Designing a pop-up book which uses a mixture of structures and mechanisms. • Naming each mechanism, input and output accurately. • Storyboarding ideas for a book. • 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 movement. • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result. • Evaluating the work of others and receiving feedback on own work. • Suggesting points for improvement.	criteria design input mechanism model motion reinforce research

Critical Content Statements:	Common Misconceptions Pupils May Have:
• Mechanisms control movement and can change one type of motion into another. • Sliders, pivots, and folds create interactive paper-based mechanisms. • A design brief outlines what needs to be designed and made. • Hiding mechanisms improves aesthetics and user experience. • Storyboarding helps plan the sequence of pages and mechanisms. • Accurate cutting and folding ensure mechanisms work smoothly. • Layers and spacers can conceal mechanical parts for a professional finish. • Evaluating and improving designs ensures functionality and appeal.	• Thinking mechanisms are only decorative and not functional. • Believing sliders and pivots work without precise alignment. • Assuming folds alone create movement without additional mechanisms. • Thinking hiding mechanisms is unnecessary for aesthetics. • Believing testing is not needed once the book is assembled. • Assuming any paper type will work for all mechanisms.