Design & Technology — Year 4 - Autumn Term — Design & Create their Own Buzzer box with linkage element.

Mechanical/Electronic

Key Vocabulary:

Series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, light emitting diode (LED), bulb, bulb holder, wire, insulator, conductor, crocodile clip control, program, system, input device, output device, process user, purpose, function, prototype, alert, safety, circuit, design criteria, innovative, appealing, design brief.

National Curriculum	Week	NC - Coverage	Skills Taught	Knowledge	Activity Outline
			Disciplinary (Why)	Factual	
			Procedural (How)		
Key stage 2 Pupils should be taught to: Design Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design Make	1	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces	I know why it's important to generate ideas, considering the purposes for which I am designing. I know how inventors have created products that have paved the path to develop into the products we have today.	I know that ideas are generated through discussion of the intended user, purpose and design criteria. I know that an alarm system emit sounds to give warnings or alerts. I know that alarm systems can be used by companies or cars to detect intrusion and people each morning to wake up.	Show children the Senet Board Game created by the Egyptians. Ask children what they think it is? What elements make them think that it is what they've said? Explain to children that it is one of the very first board games made from around 3500 BC by the Egyptians. What elements are similar now on-board games? How have they developed? Show children the Operation Game originally made by Milton Bradley in 1965. Ask children how this buzzer game has shaped the path for other games with sound? Can they think of different board games with

Select from and use a wider range		and computer-aided	I know why it is important		element of sounds? How does
of tools and equipment to perform		design	that my product will need		including sound appeal to the
practical tasks [for example, cutting,			to follow a design criteria,		user?
shaping, joining and finishing],			which incorporates the		COURTON A
accurately			precise goals that a project		
			must achieve in order to		T. C. C.
Select from and use a wider range			be successful. e.g. a circuit		
of materials and components,			to power the buzzer and		
including construction materials,			light, a switch to safely		
textiles and ingredients, according			control the input and output.		Explain to children that they are
to their functional properties and			ομιραί.		going to be creating their own
aesthetic qualities					board game with a buzzer and a
Evaluate					linkage system included, similar to
Investigate and analyse a range of					the one below:
existing products					
Charling products					
Evaluate their ideas and products					
against their own design criteria					Buzzer Wite Glance
and consider the views of others to					Discuss with children the intended
improve their work					user and purpose of the game.
					(children can have different user
Understand how key events and					and purpose)
individuals in design and technology					' '
have helped shape the world					Discuss and agree on a design
<u>Technical knowledge</u>					criterion. Remind children of the
Apply their understanding of how to					importance of a design criterion and that it must be measurable/
strengthen, stiffen and reinforce					and that it must be measurable
more complex structures		Use research and develop	I know why it is important	I know that the key	Show children various different
		design criteria to inform	to evaluate products and	components of an alarm	noise component board games.
Understand and use mechanical	2-3	the design of innovative,	identify criteria that can	system are electrical	Can they identify what might be
systems in their products [for		functional, appealing	be used for my own	circuits, buzzers, switches,	happening? How is the product
example, gears, pulleys, cams, levers		products that are fit for	designs.	batteries and light	making the noise when something
and linkages]		purpose, aimed at		systems.	is touched?

Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]

Apply their understanding of computing to program, monitor and control their products

<u>Cooking</u>

Understand and apply the principles of a healthy and varied diet

Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques

Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

particular individuals or groups

Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]

I know that mechanical and electrical systems have an input, process and an output.

I know that there are dangers associated with mains electricity and ensuring I assemble parts of my circuit safely — e.g. ensuring there is no water around electricity, not touching damaged wires or making a short circuit that could overheat.

I know that pressure switches are widely used for a large range of applications throughout industry and manufacturing. Their function is to provide systems with electrical feedback in response to measuring a rise or fall in pressure.

Allow children to research various different games in order identify a theme that they want to include within their buzzer game. Remind them that what theme they chose must be suitable for their intended user.

Explain to children what an electrical system is and that it must have an input and output. Model creating a simple circuit.

What are the key components needed to create an electrical system? What is an insulator of electricity? How can we use this understanding so that when the handle touches the metal/copper it creates a noise? What is happening to the circuit when the handle is not touching?

Allow children to investigate creating their own electrical systems and what happens when the circuit is broken and re connected.

	Understand o	3	I know that there are	Explain to children that they will
	electrical system products [for e	example, identify criteria that can	symbols associated with functioning circuits.	also be adding a mechanical component to their buzzer game.
	series circ incorporating bulbs, buzze motors	switches, designs. ers and	I know that a prototype is an early sample, model, or release of a product built to test a concept or	Can children remember what a mechanical system is? What mechanical systems do they already know and how have they used them before?
		symbols for each component of my circuit e.g. battery, LED's, bulb,	process.	Show children different linkage systems. What is this similar to? How do they work?
		wire, buzzer.	I know that switches can be used as 'push-to-make' to detect intrusion and 'push-to-break' to detect somebody lifting	FIVOI FIVED PIVOI POINT
	4		something.	Explain to children that they are going to include a linkage element so that the game can be put into 'on' mode and people know that the game is 'live'. Example below:
				T DISTRE
				Teacher Note: Linkage – Two rectangular pieces of cardboard of similar size joined together at the ends with a split pin that is allowed to move freely and

				therefore does not go through the cardboard base. The second split pin goes through the middle of the arm and through the cardboard box loosely to allow pivot movement. To operate linkage push or pull the lever from the point labelled green X. Allow children to mark out, measure and cut the material they need to create their linkage component ready for their product.
5-6	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces	I know how to make labelled drawings from different views showing specific features. I know how to assemble key parts of my circuit to create a functioning alarm system of my choice. I know why it is important to develop a clear idea of what has to be done, planning how to use materials, equipment and	I know that an exploded- view drawing is a diagram, picture, schematic or technical drawing of an object, that shows the relationship or order of assembly of various parts. I know that switches can be turned on and off.	Model creating an exploded diagram design. Explain to children that this design allows you to see each component of the design as some of them will be hidden underneath the base. Explain to children that they need to label the materials, equipment and processes that they intend to use. Discuss the importance of having a 'back up' plan. Do the creating of our products always go to plan? Explain to children that it is

Und electric produ s incorp	computer-aided design erstand and use al systems in their acts [for example, eries circuits corating switches, pos, buzzers and motors]	processes, and suggesting alternative methods. I know how to use computer technology to design my alarm system, identifying key parts.		important to identify alternative methods of making if the first attempts fail. Remind children that when materials and components are joined this can be done in permanent or non-permanent ways. Discuss the different ways and what makes them different.
7-9 7-9 The including their function and a color of the	t from and use a range of tools and ment to perform ctical tasks [for ample, cutting, ing, joining and ning], accurately t from and use a range of materials d components, ding construction rials, textiles and tents, according to nctional properties testhetic qualities erstand and use al systems in their acts [for example,	I know why I need to select appropriate tools and develop techniques for making my product. I know how to join and combine materials and components accurately in temporary and permanent way.	I know that copper tape is used to provide the current from one part of the circuit to another. I know that I can use a paper clip to complete my circuit, and this will act as a switch. I know that I can cut and join a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue to create my	Explain to children that they already have their linkage system and they understand how to create their electrical system, so they must first focus on their base and ensure that it is stable enough to house all elements of the product. How can we ensure that we reinforce the 3D framework? Explain to children that cardboard triangles can be used

series circuits incorporating		alarm system and hide wiring.	within the corners to reinforce the edges. Model creating this. Allow children to create their product. Reminding them to continuously evaluate their product, is it going the way they planned? What have they changed? Stop the children and ask them what finishing elements are. Why are they important and how do they support the development of the product? Have a discussion about appropriate finishing elements for their product.
Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work	I know why it is important to evaluate my work both during and at the end of the assignment, and that I can use the data collected to collate within bar and pie charts to analyse. I know how to evaluate my product by carrying out appropriate tests.	I know that I am able to use questionnaires to collect data from participants about my product.	Give children the opportunity to reflect back to their intended user, purpose and design criteria. Have they achieved these? Encourage discussion with peers to identify reasons as to why and why not. Allow children to evaluate their own product independent and then collect some feedback from others in the room. This can be

		done using Post It Notes stuck inside books.
		Discuss the different of aesthetical and function? We know that aesthetical is all based on personal preference and that's why it is important to aim to product at the appropriate intended user. However, the functional element of our product can be evaluated through testing.
		How could we test this product to see whether the functionality works correctly?
		Give children the chance to test out different peers' games. Can they identify strengths and weaknesses within each one?

Design & Technology — Year 4 — Spring Term — Design & Create their own Treasure Bag

Sewing

Key Vocabulary:

Fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance, back stitch, running stitch, blanket stitch, thread, user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces.

National Curriculum	Week	NC - Coverage	Skills Taught	Knowledge	Activity Outline
			Disciplinary (Why)	Factual	
			Procedural (How)		
Key stage 2 Pupils should be taught to: Design Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups Generate, develop, model and communicate their ideas through discussion, annotated sketches,	1	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross- sectional and exploded	I know why it is important to generate ideas, considering the purposes for which I am designing.	I know that a bag is a flexible container with an open top used for carrying things, made from various materials. I know that bags can be bought in a variety of shapes, sizes and types for different purposes. I know that bags can be made from cotton, which is	Explain to children that they are going to create their own treasure bag. Discuss an intended user and purpose. With this in mind, collect ideas as a class about the type of bag that they might create to suit their user and purpose. Discuss the importance of a design criteria. Allow children
cross-sectional and exploded		diagrams, prototypes,		a thread that is spun from	to create their own design criteria.

diagrams, prototypes, pattern pieces and computer-aided design Make Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing],		pattern pieces and computer-aided design		fibres from the cotton plant. I know that treasure bags are used to keep valuable items safe.	Give children the chance to evaluate and discuss existing products to support them in designing their own treasure bag.
Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities Evaluate Investigate and analyse a range of existing products Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work Understand how key events and individuals in design and technology have helped shape the world Technical knowledge Apply their understanding of how to strengthen, stiffen and reinforce more complex structures	2-3	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups Generate, develop, model and communicate their ideas through discussion, annotated sketches, crosssectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	I know how to develop key sewing skills to combine and secure materials. I know why it is important to develop knowledge of different stitches and key sewing skills to support the creation of my product.	I know that different types of stitches can be used for the purpose of functionality and aesthetics. I know that I will need to push my thread through the eye of the needle. I know that a button is a type of fastening that holds two pieces of fabric together. I know that an overlay stitch is a sewing technique used to hold the thread without creating an obvious mark at the beginning or end of the stitching.	Ask children what stitches they already know? (basting, running and invisible) How are they similar? What is the movement in each? Model each stitch again and allow children to re-practise these stitches on their own prototype piece of material. Explain to children that they will now learn a new stitch—a backstitch. Model the stitch. Give children the opportunity to practise this stitch on their prototype piece of material. Remind children of the importance of finishing

Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] Understand and use electrical systems in their products [for					techniques e.g adding buttons and additional pieces of materials. How do we sew these on effectively? Model sewing additional materials on.
example, series circuits incorporating switches, bulbs, buzzers and motors. Apply their understanding of computing to program, monitor and control their products. Cooking Understand and apply the principles of a healthy and varied diet Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.	4-5	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	I know how to make labelled drawings from different views showing specific features. I know why it is important to develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making, if the first attempts fail.	I know that fabrics can be strengthened, stiffened and reinforced where appropriate using glue, stitches or another form of fabric. I know that an exploded-view drawing is a diagram, picture, schematic or technical drawing of an object, that shows the relationship or order of assembly of various parts.	Remind children of the difference between aesthetical and functional. Model deciding what materials and tools are either used for aesthetic reasons or to support functionality of the product. Explain to children that as the bag will have multiple different elements, front back and sides, a diagram that has different drawing from multiple angles will be most appropriate when designing. Model this and labelling the techniques, materials and processes e.g sewing techniques, pinning etc. Allow children to design their product. Ask them to reflect on what they will do if the technique/processes they have

6-8	Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities	I know why it is important to select appropriate tools and techniques for making their product. I know how to measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques. I know how to join and combine materials and components accurately in temporary and permanent ways. I know how to sew using a range of different stitches, weave and knit to assemble my chosen materials — running, basting and overlay stitch.	I know that threading a needle requires a steady hand and patience, as the thread will need to pass through the eye of the needle. I know that I must mark our pieces of material using measuring tape and cut using scissors.	suggested do not work. Remind them of the importance of having a 'back up' plan. Discuss the importance of measuring and pinning the product together before sewing. How does this improve our product? Model measuring out the materials accurately. Explain to children that it is important to continuously evaluate their product during the creating process. Why do they think that is? How does this support the development of their product? Allow children to create their product, circling the room to support where needed.
9	Investigate and analyse a range of existing products Evaluate their ideas and products against their own	I know why it is important to evaluate my work both during and at the end of the assignment.	I know that to evaluate the effectiveness of my product, I can use the data	Allow children to reflect back to the design criteria, intended user and purpose.

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Investigate and analyse a range of existing products	I know how to evaluate my product and identify criteria that can be used	I know that I am able to use questionnaires to collect data from mu peers.	not. Did they come across any challenges? What would they do next time to improve their product? How was their time management when creating the product? Can they test their products functionality? Does it hold something secure? Peer Evaluation Questionnaire Feedback and
range of existing products Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work		use questionnaires to collect data from my peers.	Questionnaire Feedback and Analysis

Design & Technology — Year 4 — Summer Term — Design & Create America Cuisine Food

Cooking

Key Vocabulary:

Name of products, names of equipment, utensils, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet, nutrition, cutting, mix.

National Curriculum	Week	NC - Coverage	Skills Taught	Knowledge	Activity Outline
			Disciplinary (Why)	Factual	
			Procedural (How)		
Key stage 2 Pupils should be taught to: Design Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	1	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross- sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	I know why it's important to generate ideas, considering the purposes for which they are designing. I know how to make labelled drawings from different views showing specific features. I know why it's important to have a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of	I know that particular dishes such as burgers, hot dogs, wings and fried chicken and potato salad are associated with the American culture. I know that a healthy dish can involve more than one food group, or one food group if it is part of a healthy balanced diet. I know that within American cuisine and culture, there are a range of	Explain to children that they are going to making an American inspired dish — A Potato Salad. Discuss the intended user, purpose and design criteria. What is meant by seasonality? Why is it important to look at seasonality of ingredients? What is the seasonality for apples? Seasonality. Apple harvest time runs from August until November when the fruit is at its peak flavour and texture. Because the

<u>Make</u>			making, if the first attempts	fresh and processed	fruit keeps well in cold
Select from and use a wider range of			fail.	ingredients appropriate for	storage, locally grown
tools and equipment to perform				my product, and some	apples are often available
practical tasks [for example, cutting,				ingredients and produce are	through the spring.
shaping, joining and finishing],				grown, reared or caught.	Give children the
accurately					opportunity to research
					different American dishes
Select from and use a wider range of					and collect feedback around
materials and components, including					the classroom based on the
construction materials, textiles and					flavour that most people
ingredients, according to their					enjoy e.g sweet, sour,
functional properties and aesthetic					bitter.
qualities					
<u>Evaluate</u>					Pupils could try a variety of
Investigate and analyse a range of					foods and complete a taste
existing products					test.
Evaluate their ideas and products					
against their own design criteria and					Ingredients — Potatoes,
consider the views of others to					soured cream, mayonnaise,
					spring onions, cucumber,
improve their work					seasoning.
Understand how key events and individuals in design and technology		Use research and develop	I know why it is important	I know that washing hands	Remind children of the
have helped shape the world		design criteria to inform the	to generate ideas,	and ingredients, where	various techniques that they
Technical knowledge		design of innovative,	considering the purposes for	appropriate, reduces	already know e.g cutting,
Apply their understanding of how to		functional, appealing	which I am designing.	microorganisms and	bridge technique, grating,
strengthen, stiffen and reinforce more	2-3	products that are fit for	3	cooking instructions are	peeling
complex structures		purpose, aimed at	I know how to make	important for this purpose	
complex structures		particular individuals or	labelled drawings from	too.	Remind them of the safety
Understand and use mechanical		groups	different views showing		when using the oven and
systems in their products [for		y. 5 4 p 5	specific features.		tools within the kitchen.
systems in their products for					

example, gears, pulleys, cams, levers and linkages] Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] Apply their understanding of computing to program, monitor and control their products Cooking Understand and apply the principles of a healthy and varied diet		Generate, develop, model and communicate their ideas through discussion, annotated sketches, crosssectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	I know why it is important to develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making, if the first attempts fail.	I know that a recipe is a set of instructions followed to prepare a particular dish. I know that an exploded-view drawing is a diagram, picture, schematic or technical drawing of an object, that shows the relationship or order of assembly of various parts.	Children to create an exploded diagram of their design, labelling techniques and ingredients used. Children to create a step process, identifying key techniques and the correct order they will follow when assembling their product.
Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.	4-6	Understand and apply the principles of a healthy and varied diet Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. Select from and use a wider range of tools and equipment to perform practical tasks [for example,	I know how to select appropriate tools and techniques for making my product and how to safely use utensils and equipment including heat sources to prepare and cook food. I know how to prepare ingredients safely and hygienically, with knowledge of the 'Eatwell plate'. I know why it is important to understand food hygiene methods when creating my product.	I know that ingredients, flavours and textures can be changed through boiling, grilling, baking and frying. I know that vegetables can be sliced using a knife within a bridge hold technique, to cut ingredients into smaller, more manageable pieces. I know that ingredients need to be measured and weighed accurately.	Re-model key techniques e.g grating, cutting, peeling and bridge technique and remind them how to use them safely. Model using the oven safely. Children to create their Potato recipe. If children have brought spices or different ingredients in allow them to use those as well. Circle the room and support where needed.

cutting, shaping, joining and finishing], accurately Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities		I know that a peeler can be used to peel the outer layer of skin from vegetables and fruits. I know that a chopping board can be used to prepare and chop ingredients safely.	
Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work	I know why it is important to evaluate my work both during and at the end of the assignment. I know how to evaluate my product carrying out appropriate tests and using the data collected from participants to collate into pie charts.	I know that I can use questionnaires to collect data from participants in relation to the taste of my product.	Remind children of the design criteria, purpose and intended user. Children to evaluate against those expectations, identifying and justifying reasons as to why they did not meet them if that was the case. Children to identify strengths within their overall product and improvements. What skill did they believe they were strong in and what would they like to improve. Remind children of the importance of carrying out tests on their product.

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		Children to carry out taste	
		evaluation test.	