# Design & Technology — Year 5 - Autumn Term — Design & Create a Light Up Toy

#### Mechanical/Electronic

## Key Vocabulary:

Pulley, gear, rotation, driver, ratio, transmit, axle, motor, circuit, switch, circuit diagram, annotated drawings, exploded diagrams, mechanical system, electrical system, input, process, output, battery, bulb, audience, user, intent, purpose.

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 and computer-aided design	I know why it's important to generate ideas, considering the purposes for which I am designing.	I know that Ruth Handler is the inventor of Barbie Dolls.  I know that the design of Barbie dolls has developed over the years to represent the cultural developments and reflect diversity within society.  I know that a specification is needed for a successful design, linked with Science, Maths.	Ruth Handler — Created Barbie Doll  Show children the first barbie doll/action figure created. Created by Ruth Handler. Ask children how are toys now, similar or different? What has changed or developed? What has stayed the same? What element of ruth Handler's design has been re-used in other designs? How has it paved the way for toys today?  Discuss with children that they have been selected to design and provide a prototype to a toy brand

Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately					panel for a new and upcoming toy that moves and has an electronic system included.  Explain to children that they are going to be
Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic					creating their own moving/electronic toy, using all the knowledge that they have learnt over the last few years.
<mark>qualities</mark> <u>Evaluate</u> Investigate and analyse a range of					Discuss with children the intended user and purpose of the game.
existing products  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work					Discuss and agree on a design criteria. Remind children of the importance of a design criteria and that it must be measurable. Think about the important components that the toy company requires from the
Understand how key events and individuals in design and technology have helped shape the world Technical knowledge					toy they are putting forward to panel.
Apply their understanding of how to strengthen, stiffen and reinforce more complex structures  Understand and use mechanical	2-3	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for	I know why it is important to evaluate products and identify criteria that can be used for my own design.	I know that a variety of light up toys are appealing to different audiences — including age, gender, cost and function.	Look at different dolls/toys  Research Different toys/dolls – What functions do they have?
systems in their products [for example, gears, pulleys, cams, levers and linkages]		purpose, aimed at particular individuals or groups			How could we incorporate different functions?

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  Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques		Generate, develop, model and communicate their ideas through discussion, annotated sketches, crosssectional 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 a variety of toys will have a movable, light up, or sound element that attract particular groups of people to buy these products.  I know that my product will need to follow a design criteria, which incorporates the precise goals that a project must achieve in order to be successful. e.g. a circuit to light up, a switch to safely control the input and output.	Show children various different existing toys — all with different elements and components. Showcasing different mechanical systems.  Allow children to mind map and discuss with one another, how each toy works, what elements they like and what elements they would change or tweak.  Circle the room and encourage children to identify the electronic system/mechanical system
Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.					used
	4	Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]	I know why it is important to evaluate products and identify criteria that can be used for their own designs.	I know that mechanical and electrical systems have an input, process and an output.	Set up three different stations — one focusing on mechanical system, one focusing on electronic system and one focusing on reinforcing and
	7	Apply their understanding of how to strengthen stiffen and reinforce more complex		I know that electrical circuits can be controlled by a simple on/off switch, or by a variable resistor that can adjust the size of the current in the circuit.	strengthening materials.  Discuss and collect ideas on all the electronic systems and mechanical systems that they have learnt and

				developed throughout the years. Remind children how some of them work and how they are put together.
				Discuss the importance of reinforcing and strengthen materials when creating their product. Discuss different techniques that can be used.
				Give children the opportunity to explore different systems. Circle the room and support where needed.
	Use research and develop design criteria to inform the design of innovative,	I know how to make labelled drawings from different views showing specific features.	I know that a variety of symbols are associated with	Remind children of the intended user, purpose and design criteria.
	functional, appealing products that are fit for purpose, aimed at particular individuals or groups	I know why it's important to develop a clear idea of	my functioning circuit and I can label my design, e.g. battery, bulb, wire, switch.	Discuss the difference between aesthetical and functional. Model identifying which tools or
5-6	Generate, develop, model and communicate their	what has to be done, planning how to use materials, equipment and	I know that there are essential characteristics of a series circuit and I can	materials are aesthetical or functional.
	ideas through discussion, annotated sketches, cross- sectional and exploded	processes, and suggesting alternative methods.	create battery-powered, functional, electrical product.	Explain to children that they are going to be using a cross sectional design
	diagrams, prototypes, pattern pieces and computer-aided design	I know why a wider range of materials and	I know that an exploded- view drawing is a diagram,	process to design their toy to ensure that they can

components should be picture, schematic or cover all elements. Example technical drawing of an Understand and use carefully chosen, including below: object, that shows the electrical systems in their construction materials, relationship or order of products [for example, textiles, according to their assembly of various parts. series circuits incorporating functional properties and switches, bulbs, buzzers and aesthetic qualities. motors] Remind children that they must identify the materials, the tools, the techniques, the electronic system, mechanical system and whether they are functional or aesthetical on their design. **SECOND PART** Explain to children that now they have designed their product, they are going to use their understanding of programming to showcase how their product will move, light up or make sound to support them when showcasing their toy to the panel.

				Model to children using Scratch and programming how their toy would move etc.  Allow children to support and discuss with one another as they programme their toy, encouraging them to look or identify any issues that they believe might occur during the making process.
7-9	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  Understand and use mechanical systems in their products [for example,	I know why it is important to select appropriate tools and techniques for making my product.  I know how to join and combine materials and components accurately in temporary and permanent way.	I know that I will need to use scissors to cut materials, glue to join and use a ruler to effectively measure and combine materials.  I know that I will need to include a functioning circuit in order for my toy to light up and hide it within the materials I have selected.	Remind children of the design criteria, intended purpose and user.  Discuss the importance of time management and continuous reflection and evaluation of their producthow can it support the development of their product?  Remind children of what is meant by the term 'finishing techniques'. Discuss the finishing techniques that they might apply to their product.

Products against their ideas and products against their ideas and the reason of the views of others are improve their work  I know who to evaluate my product carrying out appropriate tests.  I know how to evaluate my product carrying out appropriate tests.  I know how to evaluate my product carrying out appropriate tests.  I know how to evaluate my product carrying out appropriate tests.  I know how to evaluate my product carrying out appropriate tests.  I know how to evaluate my product carrying out appropriate tests.  I know that I am able to independently evaluate their product against the design criteria and its intended purpose. Can they identify strengths in their skills and improvements that they would have liked to have made?  Children to collect customer feedback before taking their product to 'panel'. Children to ask various people within the school about their product. Model creating appropriate questions to ask. E.G. Do the colours used appeal to you? Do you like the functionality of the product? Encourage children to also think of one question where they can collect a lengthy answer.  Children to take their product to 'panel' with their		gears, pulleys, cams, levers and linkages			Allow children to create their moving, functional toy. Support where needed.
collect customer feedback,		products against their own design criteria and consider the views of others to	to evaluate my work both during and at the end of the assignment and I can use the data collected to collate within bar charts.  I know how to evaluate my product carrying out	use questionnaires to collect	independently evaluate their product against the design criteria and its intended purpose. Can they identify strengths in their skills and improvements that they would have liked to have made?  Children to collect customer feedback before taking their product to 'panel'. Children to ask various people within the school about their product. Model creating appropriate questions to ask. E.G. Do the colours used appeal to you? Do you like the functionality of the product? Encourage children to also think of one question where they can collect a lengthy answer.  Children to take their product to 'panel' with their

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		their programming showcase and their prototype product.

### Design & Technology — Year 5 — Spring Term —Design & Create their Own Pull Cord Bag

#### <u>Sewing</u>

# Key Vocabulary:

Seam, seam allowance, wadding, reinforce, hem, template, pattern pieces, name of textiles and fastenings used, pins, needles, thread, fastenings, annotate, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype.

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 is important to generate ideas, considering the purposes for which they are 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 through history bags have developed and the earliest bags were made from animal skin.  I know that bags can be bought in a variety of shapes, sizes and types for different purposes.	Show children various different bags, with different elements. Encourage children to explore the products. How have they been made? What stitches have been used? What finishing techniques have been applied? What do they like?  Explain to children that they are going to create a bag prototype for a local designer looking at supplying a new range of bags.

Make 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  Evaluate  Investigate and analyse a range of existing products  Evaluate their ideas and products		Investigate and analyse a range of existing products		I know that cotton is a thread that is spun from fibres from the cotton plant. It is used widely due to its good durability and soft handle.  I know that Dick Kelty developed the backpack design to make it more comfortable.	Discuss with children the intended user, purpose and design criteria.  Give children the opportunity to research and collect a mood board of materials, finishing techniques, sewing stitches, colours etc — this can be done on the computer or through cutting and sticking of images. E.g.
against their own design criteria and consider the views of others to improve their work  Understand how key events and	2-3	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at	I know why it is important to develop knowledge of different stitches to support the creation of my bag.	I know that I will need to push my thread through the eye of the needle.	Remind children of the stitches that they already know and have developed skills in – basting, invisible, running and backstitch.
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		particular individuals or groups  Generate, develop, model and communicate their ideas through discussion,	I know how to develop key sewing skills using a needle, thread and materials to combine materials securely.	I know that a button is a type of fastening that holds two pieces of fabric together.	Give children the opportunity to re-practise those skills on a piece of material. This can be kept in books to showcase their protype development.
Understand and use mechanical systems in their products [for		annotated sketches, cross- sectional and exploded diagrams, prototypes,		I know that the thread will need to pass through two	Discuss different bag elements e.g. button, pull cord or zip. Discuss different ways that these

example, gears, pulleys, cams, levers and linkages]		pattern pieces and computer-aided design		pieces of fabric to successfully join together.	can be attached and secured so that they are functional.
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				I know that I will need to tie a knot at the end of the thread to secure my stitch using a simple overhand knot.	Model each one and give children the opportunity to practise the key skills needed to apply these.
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				I know that overcast stitch is more effective than running stitch to create a secure and permanent bind.	
Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.				I know that running stitch can quickly join two fabrics together along a line.	
	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	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	I know that fabrics can be strengthened, stiffened and reinforced where appropriate using glue, stitches or another form of fabric.	Remind children of the intended user, purpose and design criteria.  Model designing a product, labelling the materials, finishing techniques, tools and stitches. Also identify whether they are to support

Generate, develop, model and communicate their ideas through discussion, annotated sketches, crosssectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	processes, and suggesting alternative methods of making, if the first attempts fail.  I know why appropriate materials, tools and techniques should be chosen for the product. E.g. cutting, shaping, joining and finishing, accurately.	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.	the functional element of their product or purely for aesthetic.  Give children the opportunity to design their product, labelling key components. Encourage children to add samples of their materials to their design page to show the materials used.
Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately	I know how to join and combine materials and components accurately in temporary and permanent ways.	I know that I must mark our pieces of material using measuring tape and cut using scissors.	Discuss the importance of accuracy within their products- accuracy within measuring materials, cutting materials etc.
Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their	I know how to sew using a range of different stitches, weave and knit.  I know how to use a variety	I know that to add an applique design I must use a template to draw, use pins to attach to fabric and secure before sewing.	Explain various finishing techniques.  Allow children to complete their bag prototype, support where needed.
functional properties and aesthetic qualities	of stitches to assemble my chosen material – running, basting and overlay stitch.	I know that cutting and joining accurately ensures a good-quality finish to the product.	Remind children of the importance of reflecting and analysing their product during the making process. How could they change

				their process if something isn't working etc.
9	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	I know why it is important to evaluate my work both during and at the end of the assignment to check the effectiveness of my bag — I the stitching secure? Does my bag have handles or straps? Will my bag keep my items secure inside?	I know that to evaluate my product I will need to evaluate it against the design criteria I have generated individually, as a means to improve my work.	Remind children of the design criteria, intended user and purpose.  Ask children to reflect and discus their final product with one of their peers.  Identifying skills they've secured, strengths within their product and improvements that they would like to make.  Let children independently evaluate their product using question scaffold support that they need to answer and justify

				Give children the opportunity to take their product to the 'shop' and persuade them to choose their product. Discussing the strengths in the design, what makes the bag good and how it is functional.
10	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	I know why it is important to evaluate my work both during and at the end of the assignment and I can use the data collected to collate within bar charts.	I know that I am able to use questionnaires to collect data.	Peer Evaluation  Questionnaire Feedback  and Analysis

# Design & Technology — Year 5 — Summer Term — Design & Create Food for Theme Parks

### Cooking

### Key Vocabulary:

Ingredients, spice, herbs, fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble, design specification, innovative, research, evaluate, 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	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 is 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 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	I know that the seasonality is the time of year when the harvest or flavour of a type of food is at its best.  I know that buying seasonal food is beneficial for many reasons: the food tastes better; it is fresher because it hasn't been transported thousands of miles; the nutritional value is higher; the carbon footprint is lower, due to reduced transport; it	Show children various different theme park foods. What do they all have in common? What do they like about them? How are they appealing to their customers who consume them?  Discuss the understanding that some food is processed from ingredients that can be eaten or used in cooking.  Look at pizza — how is this effective and functional for a theme park? e.g., simple design, less messy, easily accessible.

Make 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			making, if the first attempts fail.  I know how to safely store food and ingredients by chilling in the fridge to avoid harmful bacteria growing.	supports local growers and is usually cheaper.  I know that theme parks sell a variety of fast foods including: pizza, burgers, hotdogs, fries and desserts which are all sold in variety of packaging.	Explain to children that they are going to create a pizza. What are healthy extras that we could add? What would taste better? What type of flavouring do they want to go for?  Discuss the intended user, purpose and design criteria for their theme park healthy alternative pizza.
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  Understand and use mechanical systems in their products [for	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, cross- sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	I know why it is important to generate ideas, considering the purposes for which they are designing.  I know why it is important to have clear and accurate food labelling and knowledge of ingredients, with particular reference to food allergies.  I know why it is important to have a healthy, nutritious diet and knowledge of appropriate food alternatives.	I know that a recipe is a set of instructions followed to prepare a particular dish.  I know that an explodedview 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 food hygiene is important to minimise cross contamination, the spread of germs and bacteria, and preventing illnesses/accidents.	Discuss and explain to children the extra ingredients and herbs and spices that they will be able to choose from to add to their pizza.  Model designing a theme park pizza — an exploded diagram. Labelling key ingredients, processes e.g measuring, tools used and finishing techniques.  Allow children to design their product on an exploded diagram. Labelling key measurements, tools used and techniques applied.

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			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.		
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	I know how to select appropriate tools and techniques for making their product.  I know how to use utensils and equipment including heat sources to prepare and cook food.  I know why it is important to understand food hygiene methods.	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.  I know that a peeler can be used to peel the outer layer of skin from vegetables and fruits.	Teacher to Model Key Cutting/Cooking Skills  Explain to children that as they are using different ingredients, there are some important processes that they must follow. Does anyone know these already? Why are they important? What would happen if we did not follow them?  Explain key food safety when using cooked/uncooked meat in the kitchen e.g. using

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 that a chopping board can be used to prepare and chop ingredients safely.  I know that herbs and spices can be added to my product to give seasoning and improve the overall taste.	different equipment when it has been used with raw meat, washing hands after touching raw meat etc.  Remind children of the key cutting techniques and how to knead the dough.  Allow children to chop, grate etc the ingredients that they intend to add to their pizza. Ask children to wash their hands thoroughly and remove and wash up any tools that have been touched with the raw meat.
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 can use questionnaires to collect data from participants in relation to the taste of my product.  I know that to test the effectiveness of my product I can evaluate the taste, texture, appearance, odour using my senses.	To give children the opportunity to self-evaluate their product against the criteria. Provide question scaffold support that encourage children to reflect on the strengths, weaknesses, skills developments, and improvements of their product.  Children to carry out an aroma, taste and appearance evaluation on each other's products.

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