Year : 5	Term : 2	Topic : Educational Toy/Game	
Learning Objectives (What will the children learn?)	**Class Activities** (What will the children do?)	**Resources** (What will I need?)	**Assessment**
Investigative, Disassembly and Evaluative Activities (IDEAs)			
Children will learn: • to challenge and evaluate the attributes and features of existing games and toys (**Progression in Design Skills R5, E3);** • to assess how adaptable specific games are for including circuits; • to produce a questionnaire independently to discover preferences of users, analysing and presenting results graphically (**Progression in Design Skills R2);** • formulate more complex questions for experts/visiting speakers (**Progression in Design Skills R5);** • use skimming and scanning techniques (**Progression in Design Skills R1);**	• Bring in toys and games from home. • Discuss and assess which toys could be adapted to include circuits. • Carry out a more detailed analysis of one or two specific products. • Look for toys through a variety of catalogues • Write a questionnaire for key stage 1 children. It should include a tally chart to record preferences of games. • Formulate questions for a visiting key stage 1 teacher to find out about the children's learning needs that could be addressed with a toy.	• Catalogues (with a toy section) • Games and toys (from home etc…)	Can the children: • challenge and evaluate the attributes and features of existing games and toys; • assess how adaptable specific games are for including circuits; • produce a questionnaire for users, analyse and presenting results graphically; • formulate more complex questions**;** • use skimming and scanning techniques?
Focused Practical Tasks (FPTs)			

Children will learn:
• How circuits can be controlled by a variety of different switches;
 	
• That different circuits can be powered by the same battery
	• Make a pressure switch ***or*** tilt switch.
	  • Pressure switch: Use two layers of foil separated by a layer of card with holes to allow contact to be made.
	  • Tilt switch: Use a ball-bearing in a tube (such as a film canister) with contacts at one end.
	• Make a variety of series circuits, using different switches – pressure, tilt, basic contact, and reed; and different types of connector – foil, wire, thin copper strips.
	• Make a parallel circuit to demonstrate how one bulb, motor or buzzer can be switched on and the other switched off. (NB: some buzzers only work when connected up in one particular way)
		• A range of switches (bought and/or made) – pressure, tilt, reed et…
		• For made switches – foil, card, paper clips,
		• Magnets
		• Wire
		• Batteries
		• Light bulbs (ensure that battery and bulb voltages match)
		• Buzzers
		• Motors
		• Plastic connector strips
		• Adhesive backed copper tape
			Can the children:
			• control a circuit by using a variety of different switches;
			• power different circuits from the same battery (parallel circuits)?

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Learning Objectives (What will the children learn?)	**Class Activities** (What will the children do?)	**Resources** (What will I need?)	**Assessment**
Design and Make Assignment (DMA)			
Children will learn: • to try out aspects of designs, e.g. computer modelling, simulations, e.g. Crocodile Clips, Science Explorer **(Progression in Design Skills M2)** • generate a range of initial ideas (**Progression in Design Skills GI/3);** • how to plan the processes, materials and tools necessary to make their product before construction • how to produce a more complex sequence of drawings with text (**Progression in Design Skills DR3);** • to apply mathematical skills to cost their product; • to use the computer to produce graphic design (**Progression in Design Skills DR4);** • canvas the views of users of the product and interpret and present results in the appropriate form (**Progression in Design Skills E2).**	Give children the following basic design brief: *design and make a toy* ➢ *suitable for a key stage 1 child;* ➢ *with an educational purpose (matching, classifying, sorting, motor skills etc…);* ➢ *that might include a switch e.g. tilt, reed, pressure etc., a series or parallel circuit;* ➢ *a bulb, buzzer or motor;* ➢ *that is attractive, reliable and safe for young children.* • Carry out a group brainstorm of the factors that will need to be considered in designing their product e.g. materials, mechanisms. • Ask children to add some of their own further details to the design brief to create a fuller specification. • Draw 2/3 possible design solutions to the brief. • Select the best design and produce detailed annotated drawings with dimensions and exploded views. • Write a step by step plan for how the toy will be made and list the resources and tools needed. • Produce costing for their solution given the price of materials and components. • Make the toys to the specification. • Evaluate how well their product matches the specification and design brief.	In addition to those provided for the focussed practical task: • ball-bearings • card for 2D and/or nets • Jinks framework materials: wood, triangular corners etc… • Hard card (2250 microns) • Coat hanger wire (for a possible buzz game) • Computer software such as: Crocodile Clips, Science Explorer	Can the children: • generate a range of initial ideas**;** • plan the processes, materials and tools necessary to make their product before construction; • produce a more complex sequence of drawings with text**;** • use the computer to produce graphic design; • canvas the views of users of the product and interpret and present results in the appropriate form?