D.T. Overview CONSTRUCTION

		FOUNDATION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
UNIT		Chairs	Moving card	Cart	Egyptian tool	Scarecrows	Moving Toy	Bridges
Design	**User** **Purpose** **Functionality** **Authenticity**	A new chair for Baby Bear to sit on safely (*story character*) - stability	A greetings card for a family member (*community*) – moving parts	A wheeled cart for the Great Fire of London *(historical community)* – moving wheels with axles and strong structure to carry possessions	A crane-like farming tool used by Ancient Egyptians to lift water *(Ancient society)* – weight bearing with movement	A scarecrow to scare birds for growers in FS *(school community)* – stability and use of electrical component	A toy to entertain a young child (*school community)* – cams mechanism using levers to move/rotate toy object	A bridge crossing the River Test from Marchwood to Southampton Docks to allow cargo ships to pass (Victorian *industry)* – movement and weight bearing
	Design decisions	Oral descriptions and playdough models of different styles of chairs/stool/seating	Explore different themes of moving cards: birthday, thank you cards Identify design criteria and evaluate drawn plans against it Paper template for size and shape	Strong structure on wooden frame with axles and wheels Drawn plans Draw plans on Paintz on ipads (IT)	Annotate drawn plans Type of mechanism Historical research Using modern techniques and tools to construct a replica model	Automated Sketchbook on ipads (IT) Annotate with reasons for design choices Use of electrical circuit Using recycled materials Fit for purpose	Tinkercad on ipads (Computer Aided Design CAD) Design based on discussions with Foundation Stage child Animal/character/shape choice Cross sectional diagram Cams movement	Prototype bridge Automated Sketchbook on ipads (IT) with hand-written edits Tinkercad (Computer Aided Design CAD) Exploded diagram Fit for purpose Follow traditional structure using local context or…
	Innovation	Shape, number of legs and shape	Choice of product type with design on card shape, levers and pivots Choice of theme for chosen user	Shape of body of cart	Structure shape, design and materials	Electrical components	Using shafts, pivots, levers or followers to create different movements Design own cams	design modern structure Use of hinge, lever and pulley and how to ensure electrical current is maintained
Make	**Materials**	choice of paper/card/plastic construction kits/cardboard tubes/recycled materials	reusable – cereal boxes for card, wrapping paper, lever arm cards with holes, embellishments	axles and wheels cardboard doweling (1cm) square section wood	levers and axles (1cm) square section wood string	(1+cm x 4cm) softwood electrical circuits	cams mechanism doweling (1cm) square section wood toy object	(1cm) square section wood pulley systems electrical circuits
	Joining	gluing (glue stick/PVA with fingers, spreaders) taping (paper masking tape/Sellotape) tying and threading (string/ribbons/treasury tags/split pins/elastic bands/paper clips) splay (flange) joint	split pins	L-brace, slot joint, flaps and tabs (cardboard) gluing wood with card triangles/axle holders	doweling lever materials to join lever to structure	nailing (nails, wood, glue) wires/battery/cell light/buzzer	gluing wood (glue gun)	nailing (butt joint) inter-locking materials (to create hinge) multiple butt joints
	Separating	tearing, cutting (sprung easy grip and basic scissors), making holes (hole punchers, pencils)		sawing square section wood (no measuring) using sawn pieces from Y6 activity	sawing doweling/square section wood from own measurement	sawing doweling and softwood	sawing doweling and square section wood	
	Shaping	folding, rolling and moulding	template	cutting out card for prototype (safety scissors) sanding	sanding		using round or eccentric cams (creating cam wheels)	sawing and cutting

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	Measuring	Comparison and estimation		To the nearest cm (ruler)		Conversion cm to mm (ruler)	To the nearest mm (ruler)	
	Finishing	colour and decoration	Lettering for card greeting	assembling components	sanding wood for smooth joins	using recycled materials electrical components	presentation of cams structure	electrical elements adding light and/or sound
	Safety	Use and storage of sharp items - scissors	Use and storage of sharp items - split pins	Use and storage of sharp items – saw	Use and storage of saw, drill and wood glue	Use and storage of hammer and nails	Use and storage of glue gun	
Evaluate	**Existing products**	safety and stability of models and 'real-life' items	movement of existing occasion cards, pictures and moving books	unique design and finishing of existing carts prototype Key individuals – Diary of Samuel Pepys explaining the need to move possessions in a cart away from the Great Fire of London	drawings of original artefacts modern joining unique design	sustainability of materials	Look at existing cams to innovate Existing shapes and designs and use of colour Key individuals/groups – Leonardo Da Vinci (plans for mechanical products such as cam hammer but mainly Japanese in origin) Cabaret Mechanical Theatre - moving toys	Evaluate against historical and modern bridges Key events – factories, development of docks and trade (Victorians) Brunel – engineer Architects of first major cast bridge – Ironbridge Local link to help context
	Own product	Orally - likes/dislikes, Fit for purpose what would be changed next time (orally)	Against design criteria - checklist	Stop and assess (orally) Do we need to make improvements and changes? What would be changed next time? (written evaluation)	Stop and assess (written formative assesment) Adjustments made Peer feedback	FS feedback – observations to identify improvements	User feedback Use verbal feedback to make improvements	Evaluate against own design criteria Test product Peer feedback
Vocabulary		plan/design/mould/model/test plastic/fabric/felt/cotton join/separate/fix/attach thread/hole punch/PVA glue/masking tape/treasury tag/split pin decoration stable/wide base/collapse review	lever lever arm pivot fixed pivot moving pivot	materials mock up wheels axles axle holders dowel square section wood card triangles chassis frame handle corrugated L-brace and slot joint flaps and tab	pulley weight counter weight fulcrum lynx jointer right angles research	nailing sanding electrical elements battery wires bulb and bulb holder buzzer motor switch deterrent	Cams mechanism – crank, shaft, follower, cam Types of cams – round, eccentric cross section drawing (IT) glue gun user finish	hinge pulley inter-lock industry drawbridge struts exploded diagram (IT)
Joining								
Separating (scissors)								
Measuring								
Sawing								
Sanding								
Drilling								
Nailing								
Electrical components								
Mechanical components								
		FS	Y1	Y2	Y3	Y4	Y5	Y6