Design and Technology

Unit of Work: Mechanical Systems

		Design Process				Technical Knowledge	Focused Tasks	Key Vocabulary	Meaningful Links
		Prior Learning	**Designing**	**Making**	**Evaluating**				
YR	**Focus:** Sliders **Product:** Information poster with pop up **User:** Class **Purpose:** To give educational information	•	• Generate simple ideas through talking and using own experiences.	• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function;	• Share their creations, explaining the process they have used;	• Working with paper and card. • How to make simple flaps. • Names of tools and techniques. • Understand how to make and use sliders.	• Cut paper and card. • Use scissors correctly. • Join materials securely.	Slider Cut Join Template Mechanism	Space
Y1	**Focus:** Wheels and axles **Product:** Carnival Float vehicle **User:** Local community **Purpose:** Advertising the Woodborough magic to the local community	• Assembled vehicles with moving wheels using construction kits. • Explored moving vehicles through play. • Gained some experience of designing, making and evaluating products for a specified user and purpose. • Developed some cutting, joining and finishing skills with card.	• Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through drawings and mock-ups.	• Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing. • Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.	• Explore and evaluate a range of products with wheels and axles. • Evaluate their ideas throughout and their products against original criteria.	• Explore and use wheels, axles and axle holders. • Distinguish between fixed and freely moving axles. • Know and use technical vocabulary relevant to the project.	• Assemble examples of different wheels and axles combinations. • Mark out, hold, cut and join materials and components correctly. • Choose appropriate adhesive. • Make a product that moves. • Make sure the axles run freely within the holders.	Axle Wheel Axle holder Chassis Friction Dowel Mechanism	Maths Devizes/ Pewsey Carnival
Y2	**Focus:** Sliders and levers **Product:** Storyboard **User:** Family **Purpose:** To retell a story	• Early experiences of working with paper and card to make simple flaps and hinges. • Experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape.	• Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through drawings and mock-ups with card and paper.	• Plan by suggesting what to do next. • Select and use tools, explaining their choices, to cut, shape and join paper and card. • Use simple finishing techniques suitable for the product they are creating.	• Explore a range of existing books and everyday products that use simple sliders and levers. • Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.	• Explore and use sliders and levers. • Understand that different mechanisms produce different types of movement. • Know and use technical vocabulary relevant to the project.	• Use different cutting techniques. • Make sliders that move up and down and side to side. • Make levers that can be used with or without a slot. • Use different finishing techniques.	Mechanism Lever Slider Slot Guide or Bridge	RE - Easter
Y3	**Focus:** Pneumatic mechanisms **Product:** Moving Monster character **User:** Readers of the book **Purpose:** To use as inspiration for character in own writing	• Explored simple mechanisms, such as sliders and levers, and simple structures. • Learnt how materials can be joined to allow movement. • Joined and combined materials using simple tools and techniques.	• Generate realistic and appropriate ideas and their own design criteria through discussion, focusing on the needs of the user. • Use annotated sketches and prototypes to develop, model and communicate ideas.	• Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons. • Select from and use finishing techniques suitable for the product they are creating.	• Investigate and analyse books, videos and products with pneumatic mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make.	• Understand and use pneumatic mechanisms. • Know and use technical vocabulary relevant to the project.	• Use syringes to create a pneumatic system. • Assemble system. • Measure accurately. • Use different joining techniques.	Compressed Input Output Pivot Lever Pneumatic Hydraulic Pressure Inflate Deflate Syringe System	English - class book 'The Iron Man'.
Y6	**Focus:** Cams and followers **Product:** Moving toy **User:** Children age 3 - 5 **Purpose:** Play/entertainment	• Experience of axles, axle holders and wheels that are fixed or free moving. • Basic understanding of different types of movement. • Experience of cutting and joining techniques with a range of materials including card, plastic and wood. • An understanding of how to strengthen and stiffen structures.	• Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide their thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.	• Produce detailed lists of tools, equipment and materials. • Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost.	• Compare the final product to the original design specification. • Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. • Investigate famous manufacturing and engineering companies relevant to the project.	• Understand that mechanical systems have an input, process and an output. • Understand how cams can be used to produce different types of movement and change the direction of movement. • Know and use technical vocabulary relevant to the project.	• Use a hand drill safely to make an off-centre cam and position it accurately in a housing. • Develop measuring, marking, cutting, shaping and joining skills using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to make cam mechanisms and construct wooden frames or card housings, as appropriate.	Rotary motion Oscillating motion Reciprocating motion Cam Follower Lever Slider Guide Spacer	English - class novel 'Cogheart'