YEAR 5

MECHANICAL SYSTEMS – POP-UP BOOKS

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
DESIGNING	**The three Prime ELGS of Communication and Language, PSED and Physical Development provide the foundations of which all other learning is built upon.** **Specific:** **Creating with Materials ELG** 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. **People Culture and Communities ELG** Describe their immediate environment using knowledge from observation, discussion, stories,	Use own ideas to design something Describe how their own idea works Design a product which moves Explain to someone else how they want to make their product Make a simple plan before making	Think of an idea and plan what to do next Explain why they have chosen specific criteria	Prove that a design meets a set criteria Design a product and make sure that it looks attractive Choose a material for both its suitability and its appearance	Use ideas from other people when designing Produce a plan and explain it Persevere and adapt when original ideas do not work Communicate ideas in a range of ways, including by sketches and drawings which are annotated	Come up with a range of ideas after collecting information from different sources Produce a detailed step-by-step plan Explain how a product will appeal to a specific audience Design a product that requires pulleys or gears	Use market research to inform plans and ideas Follow and refine original plans Justify planning in a convincing way Show that culture and society is considered in plans and designs

	non-fiction texts, and maps.						
MAKING	**The three Prime ELGS of Communication and Language, PSED and Physical Development provide the foundations of which all other learning is built upon.** **Specific:** **Creating with Materials ELG** 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.	Use own ideas to make something Make a product which moves Choose appropriate resources and tools	Choose tools and materials and explain why they have chosen them Join materials and components in different ways Measure materials to use in a model or structure	Follow a step-by-step plan, choosing the right equipment and materials Select the most appropriate tools and techniques for a given task Make a product which uses both electrical and mechanical components Work accurately to measure, make cuts and make holes	Know which tools to use for a particular task and show knowledge of handling the tool Know which material is likely to give the best outcome Measure accurately	Use a range of tools and equipment competently Make a prototype before making a final version Make a product that relies on pulleys or gears	Know which tool to use for a specific practical task Know how to use any tool correctly and safely Know what each tool is used for Explain why a specific tool is best for specific action
EVALUATING	**The three Prime ELGS of Communication and Language, PSED and Physical Development provide the foundations of which all other**	Describe how something works Explain what works well and not so well in the model they have made	Explain what went well with their work	Explain how to improve a finished model Know why a model has or has not been successful	Evaluate and suggest improvements for designs Evaluate products for both their purpose and appearance	Suggest alternative plans; outlining the positive features and draw backs Evaluate appearance and function against original criteria	Know how to test and evaluate designed products Explain how products should be stored and give reasons

	learning is built upon. **Specific:** **Creating with Materials ELG** 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.				Explain how the design has been improved Use IT where appropriate to add to the quality of the product		Evaluate product against clear criteria
TECHNICAL KNOWLEDGE		Make their own model stronger Make a model stronger and more stable Use wheels and axles, when appropriate to do so		Know how to strengthen a product by stiffening a given part or reinforce a part of the structure Use a simple IT program within the design Know how to be hygienic and safe when using food Bring a creative element to the food product being designed		Link scientific knowledge to design by using pulleys or gears Use more complex IT program to help enhance the quality of the product produced Use electrical systems correctly and accurately to enhance a given product Know which IT product would enhance a specific product Use knowledge to improve a made product by strengthening, stiffening or reinforcing	
FOOD TECHNOLOGY		Cut food safely Weigh ingredients to use in a recipe Describe the ingredients used when making a dish or cake		Describe how food ingredients come together Weigh out ingredients and follow a given recipe to create a dish Talk about which food is healthy and which food is not Know when food is ready for harvesting Describe how food ingredients come together		Be both hygienic and safe in the kitchen Know how to prepare a meal by collecting the ingredients in the first place Know which season various foods are available for harvesting Explain how food ingredients should be stored and give reasons Work within a budget to create a meal	

			Weigh out ingredients and follow a given recipe to create a dish Talk about which food is healthy and which food is not Know when food is ready for harvesting	Understand the difference between a savoury dish and sweet dish.

COMPOSITES

MECHANICAL SYSTEMS – POP-UP BOOKS

Design, make and evaluate a pop-up book with movable parts

COMPONENTS

	1	2	3	4	5	End Point
	Can I research and explore how mechanisms work - levers and linkages?	**How can I communicate my ideas?** **Can I practise fixing materials together to make a variety of strong mechanisms?** **How can I evaluate the tools and materials I use?**	**Can I use my understanding of mechanisms to further develop my product?** **What are the benefits of the mechanical systems in my product?**	**Can I choose materials and tools to make my book aesthetically pleasing (meet the design criteria)?** **How can I evaluate my product?**	**Use lesson tome if necessary to share books with Year 1 children**	**Children will know how to apply a variety of known mechanics from previous learning.** **Children will be able to choose appropriate materials and create a simple labelled diagram and clear instructions for making a pop-up book** **Children will be able to explore how to use levers and linkages alongside additional moving parts.** **Children use knowledge of a loose pivot and a fixed pivot to make parallel motion levers and simple levers.** **Children will evaluate their design, suggest how they overcome**

						challenges and consider improvements they can make.
CONCEPTS **Link to concept map**	Design	Design				Children will have used their understanding and knowledge of mechanical systems, including levers and linkages, to design a working toy.
	Purpose			Purpose		Children will design their books for use by children aged 5 and 6, making them strong and aesthetically pleasing.
		Systems	Systems	Systems		Children will understand the systems that are needed to make parts of their book move.
		Technique	Technique	Technique		Children will have made a pop-up book using a variety of key features (sliders, concertina folds, lifting flaps, paper springs, simple levers, parallel motion levers and bridges).
		Critical Thinking	Critical Thinking	Critical Thinking		Children will evaluate their design and reflect on peer feedback.
SKILLS	Come up with a range of ideas after collecting information from different sources Produce a detailed step-by-step plan Explain how a product will appeal to a specific audience	Use a range of tools and equipment competently Make a prototype before making a final version Suggest alternative plans; outlining the positive features and draw backs Evaluate appearance and function against original criteria	Explain how a product will appeal to a specific audience Use a range of tools and equipment competently Make a prototype before making a final version Suggest alternative plans; outlining the positive features and draw backs Use knowledge to improve a made product by	Explain how a product will appeal to a specific audience Use a range of tools and equipment competently gears Suggest alternative plans; outlining the positive features and draw backs Evaluate appearance and function against original criteria		Children will know how mechanical systems in books work and where they might be applied. Children will be able to use knowledge of mechanics, including levers and linkages, within their designs. Children will create a working pop-up book and reflect on their design.

			strengthening, stiffening or reinforcing Evaluate appearance and function against original criteria			
KNOWLEDGE **Z:\Hubs\Science and DT\DT\2023-2024\KAPOW\YEAR 5\MECHANICAL SYSTEMS - Pop Up Books\Knowledge Organiser.pdf**	Draw on their previous knowledge and research skills to help generate ideas of how to make a pop-up book. Investigate different ways to make a pop-up book (including sliders, concertina folds, lift the flaps, paper springs, simple levers and parallel motion levers).	Begin to develop their ideas through talk, drawing and practising to join materials. Explore using tools to strengthen their mechanisms	Discuss and explore a variety of materials and tools and their uses. Explore using tools to strengthen their mechanisms Consider how to make my book aesthetically pleasing. Evaluate my product	Use tools and materials appropriately to improve the appearance and use of my product. Evaluate product by discussion and ensure product is fit for purpose. Evaluate my design, identifying strengths and possible changes that could be made. Discuss evaluation critical thinking peers.		Children will follow a design, create and evaluate process to make a working moving toy which incorporates a variety of mechanisms including levers and linkages.
LESSON LINK	KAPOW – MECHANICAL SYSTEMS – POP-UP BOOKS	KAPOW – MECHANICAL SYSTEMS – POP-UP BOOKS	KAPOW – MECHANICAL SYSTEMS – POP-UP BOOKS	KAPOW – MECHANICAL SYSTEMS – POP-UP BOOKS		

PROGRESSIVE VOCABULARY	design input motion mechanism criteria research reinforce model	design input motion mechanism criteria research reinforce model	design input motion mechanism criteria research reinforce model	design input motion mechanism criteria research reinforce model		Articulate and recognise subject specific vocabulary
CURRICULUM EXPERIENCES		Children to explore creating and strengthening mechanisms	Children to explore creating and strengthening mechanisms	Share books with Year 1 children		
END POINT	Children will know what levers and linkages are. Children will design a pop-up book.	Children will have explored a variety of techniques and how they can be applied within the brief.	Children will apply knowledge in designing their own pop-up book and think about the aesthetics and purpose of the product.	Children will have made a working pop-up book using a variety of mechanical techniques and shared with an age-appropriate child.		