YEAR 4

MECHANICAL SYSTEMS – MAKING A SLINGSHOT CAR

	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, non-fiction texts, and maps.	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 criterion 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

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 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.	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 Explain how the design has been improved Use IT where appropriate to add to the quality of the product	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 Evaluate product against clear criteria

	Share their creations, explaining the process they have used.						
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 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		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 Understand the difference between a savoury dish and sweet dish.	

COMPOSITES MECHANICAL SYSTEMS SLING SHOT CAR Design, make and evaluate a working slingshot car						
COMPONENTS						
	1	**2**	**3**	**4**	**5**	**End Point**
	What is a chassis? **What is kinetic energy?**	**Can I design a suitable car body shape to cover my chassis?** **Can I design a shape that applies air resistance?** **What is kinetic energy?**	**Can I make a net?** **How can I measure and cut accurately?**	**Can I assemble and test my completed product?** **How do shapes effect air resistance?** **Can I evaluate the speed of my design?** **How can I evaluate and assess my product against the design criteria?**	**Carried over from lesson 4 if needed EVALULATION**	**Children will know what a chassis is.** **Children will know what a chassis is used for on a car.** **Children will have experimented in making a shape that is air resistant.** **Children will apply this air resistance knowledge in designing their sling shot car** **Children will have explored making a model base on their chosen design** **Children will have experienced making nets with tabs that work; measuring, marking, cutting and assembling materials.** **Children will have made their model based on their design, including considering aesthetics.** **Children will have evaluated their design**

						and their execution in making a working model of a sling shot car. **Children will evaluate the speed of their sling shot car based on effectiveness of shape and accuracy of workmanship.** **Children will be able to consider positive feedback offered by peers.**
CONCEPTS **Link to concept map**		Design	Design			Children will have used their understanding and knowledge of mechanical systems in their product
	Purpose	Purpose	Purpose	Purpose		Children will design a car body that reduces air resistance. Children will consider that the car uses kinetic energy and will need to move effectively
	Systems	Systems	Systems	Systems		Children will understand the systems needed to make an effective car body
	Techniques	Techniques	Techniques	Technique		Children will have made an effective working Sling Shot car
		Critical Thinking	Critical Thinking	Critical Thinking		Children will evaluate their mechanical system design and reflect on peer feedback
SKILLS	Use ideas from other people when designing Communicate ideas in a range of ways, including by sketches	Use ideas from other people when designing Produce a plan and explain it	Know which tools to use for a particular task and show knowledge of handling the tool	Know which tools to use for a particular task and show knowledge of handling the tool		Children will follow a design, create and evaluate the processes used to make a sling shot car which incorporates air resistance techniques

	and drawings which are annotated Evaluate products for both their purpose and appearance Explain how the design has been improved	Persevere and adapt when original ideas do not work Communicate ideas in a range of ways, including by sketches and drawings which are annotated Know which material is likely to give the best outcome	Know which material is likely to give the best outcome Measure accurately	Know which material is likely to give the best outcome Measure accurately Evaluate and suggest improvements for designs Evaluate products for both their purpose and appearance Explain how the design has been improved Use IT where appropriate to add to the quality of the product		
KNOWLEDGE **Z:\Hubs\Science and DT\DT\2023-2024\KAPOW\YEAR 4\MECHANICAL SYSTEMS - Making a Slingshot Car\Knolwledge Organiser.pdf**	I will be able to make a chassis and a sling shot mechanism I will apply my understanding of how to strengthen, stiffen and reinforce more complex structures. I will understand and use mechanical systems in my products	I will be able to plan my design and make a suitable body shape of a car to cover its chassis I will be able to apply my knowledge of air resistance in my sling shot car design I understand the term kinetic energy	I can plan and design my sling shop car using my knowledge of 2d and 3d shapes I can make a net and tabs I can use a range of tools safely and accurately to measure, mark, cut and assemble my design	I can make my sling shot car product I can evaluate my sling shot car design and say how I would improve it		Children will know what air resistance is. Children will be able to use knowledge of 2d and 3d shape to make a structure. Children will be able to design and make a sling shot car. Children will be able to evaluate their product.

LESSON LINK www.kapowprimary.com/subjects/design-technology/lower-key-stage-2/year-4/mechanical-systems-making-a-slingshot-car/	KAPOW - MECHANICAL SYSTEMS – MAKING A SLINGSHOT CAR	KAPOW - MECHANICAL SYSTEMS – MAKING A SLINGSHOT CAR	KAPOW - MECHANICAL SYSTEMS – MAKING A SLINGSHOT CAR	KAPOW - MECHANICAL SYSTEMS – MAKING A SLINGSHOT CAR		
PROGRESSIVE VOCABULARY	chassis energy kinetic mechanism	air resistance chassis design graphics model research structure template	air resistance chassis design graphics model research structure template	chassis energy design graphics model research structure template		Articulate and recognise subject specific vocabulary
CURRICULUM EXPERIENCES	Pupils to look at a variety of images of real vehicles, including racing cars.		Pupils create their own sling shot cars	Pupils create and test their own slingshot cards		Pupils to look at a variety of images of real vehicles, including racing cars. Pupils create their own sling shot cars Pupil's test and evaluate their own slingshot cards
END POINT	Children will know what a chassis is Children will know what a chassis is used for on a car	Children will have experimented in making a shape that is air resistant Children will apply this knowledge in designing their sling shot car	Children will have explored making a model base on their chosen design Children will have experienced making nets with tabs that work; measuring, marking, cutting	Children will have made their model based on their design, including considering aesthetics. Children will have considered their design and begun to think about evaluating its success	Children will have evaluated their design and their execution in making a working model of a sling shot car. Children will evaluate the speed of their sling shot car based on effectiveness of	Pupils to look at a variety of images of real vehicles, including racing cars. Pupils create their own sling shot cars Pupil's test and evaluate their own slingshot cards

			and assembling materials.		shape and accuracy of workmanship. Children will be able to consider positive feedback offered by peers.	