Year 4 Medium Term Planning for the Learning Challenge Curriculum

Term: Spring DT Project: Pull Back Cars (spinning mechanism)

Previous Learning	New Knowledge /Consolidation	End of Project Outcome	Environmental Links	Key Inventors/People	Project Vocabulary
Pupils have previously created a moving vehicle that was not self-propelled using an axle and a sail (raisin box racers in Y2).	Use of elastic to create a twirling mechanism. Use of hot glue as an adhesive.	To create a pull-back car that is self-propelled using a spinning mechanism. **Alternative project – Butter Tub Paddle Boat (use of kinetic energy to create movement)**	Consider which parts of our car could be recycled and which parts would need to go in general waste? Mind map on PowerPoint.	How have pull back toys changed over time – class investigation using MagicSchoolAI	Investigate & Compare CAD (Computer Aided Design) Select & Decide Criteria Assemble & Components Properties Scale Finish Reinforce Functional Mechanism Review & Evaluate Reusable & Recycle

Section	Lesson	Key Skills	Learning Objective & Activity
Explore	**1**	• Evaluate existing products based on design, materials, and function. • Appreciate how products have changed over time & some reasons for this.	**To investigate the properties of materials and how this effects how they float.** How has the pull back car developed over time? Use MagicSchool AI to investigate key stages of how pull back cars have developed. *Planning absent from this project due to the step by step nature of the make (planning objectives are met as part of key skills).
Make	**3**	• Select and combine materials to meet design needs. • Measure, mark, cut, and shape materials accurately. • Create a simple wind-up mechanism from plastic.	Use Step by Step guide displayed on teacher PPT Pupils to use a ruler effectively to measure accurately to create a base and axel that fit together (measuring half way point as point of reference for shaping base). Class discussion: How do our models differ from those in the example- e.g. use of corrugated cardboard packaging so the axel could be fed through without the need for straws.

			Discuss how we could strengthen using the following techniques: • *Adding more card or folding the card (cladding and rendering)* • *Using straws to scaffold.* • *Adding lolly sticks to scaffold.* • *Using extra layers of tape.* • *Covering it in layers of glue.*
Evaluate	**4**	• Test & refine products to see if they work as intended. • Identify strengths and weaknesses in a product. • Explain what went well and what could be improved. • Understand how mechanisms can be used to store & release energy.	Test the axels to make sure they moved freely then test the mechanism to ensure it moved the wheels. Explore adding extra weight to increase and decrease friction until the right balance is found to move their car. *Highlight how the mechanism uses stored energy to function. Watch the effects of Friction video: https://www.bbc.co.uk/bitesize/articles/zcmwkty#zq2ccmn Need to add evaluation notes

Substantive Knowledge	Disciplinary Knowledge