Year 4 Medium Term Planning for the Learning Challenge Curriculum

Term: Spring DT Project: Paddle Boats (twirling 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.	Use of elastic to create a twirling mechanism. Use of hot glue as an adhesive.	To create a paddle boat that is self-propelled using a twirling mechanism.	Consider which parts of our boat could be recycled and which parts would need to go in general waste? Mind map on PowerPoint.	How have boats/ships changed over time: https://www.youtube.com/watch?v=kupNhIXwGSc	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, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose • Use research for design ideas	**To investigate the properties of materials and how this effects how they float.** Explore toy boats made from different materials (foam, plastic, wood). Will they float? Why? Objects to be passed around & tested as a class using a tub of water. Record reasons in a table (PowerPoint slide).
Plan	**1**	• Show how a design meets a range of requirements and is fit for purpose • Begin to create their own design criteria, with support • Have at least one idea about how to create product and suggest improvements for its design. • Include an annotated sketch as part of the design process	**Create a design criteria and plan, considering available & suitable materials.** Examine a completed "paddle boat" (use photographs from last year) and discuss & list what our paddle boat needs to have to be a success (design criteria). How could we improve the design? Use Seesaw template to select materials to create: • Twirling Mechanism • Captain's Cabin

		• Make and explain design decisions considering availability of resources • Explain how product will work • Use a range of media to show the design including ICT software.	• Boat body Discuss & list available materials and select appropriate materials from the list. Label key features and the materials used. Describe how the “twirling mechanism will work”.
Make	**2 & 3**	• Select suitable tools and equipment, explain choices in relation to required techniques and use accurately & select appropriate materials, fit for purpose; explain choices • Work through a plan in order. • Realise if the product is going to be good quality and adjust accordingly • Measure, mark out, cut and shape materials and components with some accuracy • Assemble, join and combine materials and components with some accuracy • Apply a range of finishing techniques with some accuracy • Measure accurately and carefully to avoid mistakes • Strengthen and reinforce products using **joining**, hammering, overlapping, **layering**. • Use finishing techniques • Refer to design criteria while designing and making	**To shape and join plastic to create a self-propelled boat that floats.** Watch how to make a Paddle Boat – Let’s Go Live with Maddie and Greg. **https://www.youtube.com/watch?v=PGWpJ5DFevc** How to make a Paddle Boat & Density Column | Mini Makers | #27 LET'S GO LIVE with Maddie & Greg - YouTube Distribute how to guides downloaded from The Centre for Life https://letsgolivescience.com/activity/how-to-make-a-paddle-boat/ Discuss how we could adapt the project – what could we change (altering the body of the boat and “rods” used for the mechanism. Use a variety of tools & adhesives (scissors, glue gun, craft knife) to join materials to create a boat with cabin and “twirling mechanism”. Consider how to reinforce the joins (while maintaining water resistance) and finishing techniques to produce a tidy model.
Evaluate	**4**	• Use criteria to evaluate product • Begin to explain how I could improve original design • Research (consider) whether products can be recycled or reused	**To consider if the boat meets the design criteria, how it can be improved and if it can be recycled.** Use water tray (EYFS) or sink to test if the boats float and are self-propelled Consider how the mechanism works and what it is called (Let’s Go Live Handout Notes). Revisit the design criteria and mark of which sections have been met using ticks (Seesaw template). List improvements that could be made (Seesaw template). Now we have finished, which parts of our boat could be recycled and which parts would need to go in general waste? Mind map on PowerPoint. How else could we create a self-propelled vehicle? Explore use of the wind up mechanism to create a moving car (example model to investigate to be passed round) and balloons to power (a bottle car and CD hovercraft). Images shared via PPT. Next steps – Introduce the reapplication of the mechanism to create twirling butterflies in Y6 (see photos from Completed Work).

			How have boats/ships changed over time: https://www.youtube.com/watch?v=kupNhIXwGSc Explore why an orange floats with the skin and sinks when peeled due to air pockets. Discuss how dense material can float providing it is the correct shape and contains air.