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Forces: Water Resistance

Aim:	Success Criteria:	Resources:
To identify the effects of water resistance by creating and racing streamlined boats. To explore the effects of water resistance.	I can explain the effects of water resistance. I can identify streamlined shapes. I can minimise the effects of water resistance on an object.	**Lesson Pack** Modelling clay Three identical measuring cylinders per group Water Junk modelling materials Large water tray Battery-powered handheld fan Stopwatch
	Key/New Words: Water resistance, streamline, force.	**Preparation:** Differentiated **Boat Race Activity Sheet** – one per child **3D Shapes Posters** (optional) – as required for display

Prior Learning:	The children will have learnt about water resistance as an opposing force in Lesson 1, and will have learnt about air resistance in Lesson 3.

Learning Sequence

Whole Class	**Water Resistance:** Children discuss their experiences of water resistance using the image on the **Lesson Presentation** as a stimulus. Explain the force of water resistance, referring to the diagram on the **Lesson Presentation**.	
	Streamlined Shapes: Explain streamlining using the examples on the **Lesson Presentation**. Children work in groups to conduct the mini-investigation into streamlined shapes as described on the **Lesson Presentation**. Explain why the shapes fell at different speeds as a result of some shapes being more streamlined than others. Can children identify streamlined shapes?	
	Boat Building: Children complete the boat race challenge as described on the **Lesson Presentation**. Provide children with the junk modelling equipment so they can make their boats, then time how long it takes each boat to cross the water tray. Children then work on their own to complete the differentiated **Boat Race Activity Sheet** by drawing and labelling their design and making a prediction for how well they think their boat will move through the water. Can children discuss how they might minimise the effects of water resistance in their design?	
	Boat Race: Children work together to time their boat as it crosses the water tray.	
	Evaluate: Children continue working on the differentiated **Boat Race Activity Sheet** by evaluating their boat's performance. Can children evaluate their boat, explaining the effects of water resistance and how they designed their boat to minimise these effects? ★ Children use the key words to evaluate their boat's performance. ★★ Children explain their choices when designing their boat, referring to water resistance and streamlined shapes in their evaluation. ★★★ Children suggest adaptations to make their boat even faster if it were raced again.	
	Apply Your Knowledge: Using the **Lesson Presentation**, ask pairs to discuss which animal shape would be the best to use for a sinking swimming toy. Take feedback on this and share the example answer.	

Taskit

Researchit: Find out how sportspeople reduce their air and water resistance when playing their sport. How do they make themselves more streamlined so that they can go faster?

Listit: Create and illustrate a list of animals that live on both land and water and that have streamlined bodies.