

<b>Our Lady and St Edward's Knowledge Organiser</b>	<b>Year 4 - Design and technology</b>	<b>Summer</b>	<b>Engineering: Ship Building</b>
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**Outcome:** The pupils will be exploring the design of ships and boats. They will research and discuss suitability of materials. The pupils will look at propellers and how they move. The end project will be the pupils making their own boat with a moving propeller.

<b>Key Knowledge</b>	<b>Key Vocabulary</b>
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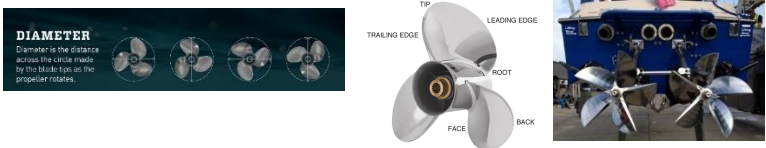
To understand why boats are made differently for different purposes.  
 To understand what makes a good propeller.  
 To design and model a vessel.  
 To choose appropriate materials for propellers and other parts of the vessel.  
 To evaluate and improve your design.  
 To predict materials that will respond better to their designs.  
 To build a product and choose how to join materials together.  
 To test your vessel is fit for purpose.

**Sail:** A piece of material extended on a mast to catch the wind and propel a boat or ship.  
**Propeller:** A device used to make an aeroplane or ship move forwards.  
**Vessel:** Ship or large boat.  
**Rotate:** Move or cause to move in a circle round an axis or centre.  
**Axis:** An imaginary line around which an object rotates.  
**Stern:** Front of the ship.  
**Bow:** Rear of the ship.  
**Design:** A plan or drawing to show the look of a building or other object before it is made.  
**Evaluate:** To decide if your design or structure meets its purpose.  
**Hull:** Main body of a vessel.  
**Rotor blades:** Four long flat pieces of metal that move around a central point.

<b>Key Information about Ship Building</b>	<b>Health and Safety</b>
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**Cammell Laird:** Founded by Scottish Entrepreneurs William Laird and his son John. It has been operating since the late 1820's. The Wirral company has built more than 1350 ships, including many famous and innovative vessels.  
**Propellers:** A propeller makes an aircraft, ship, or submarine in water or air go by making a big wind or a strong stream. It does this by turning two or more wings very quickly. The blades of a propeller act as rotating wings, and produce force through application of both Bernoulli's principle and Newton's third law, generating a difference in pressure between the forward and rear surfaces of the airfoil-shaped blades.

All children should be supervised when using equipment.  
 Equipment: Scissors and different adhesive products whilst creating their vessels.  
 The children will need to be supervised during any experiments including water.



The diagram shows a propeller with various parts labeled: TIP (the outer edge of the blade), LEADING EDGE (the front edge), ROOT (the base where the blade meets the hub), TRAILING EDGE (the back edge), FACE (the front surface), and BACK (the rear surface). A separate photo shows a propeller in a workshop setting.

<b>What I should already know:</b>	<b>By the end of this unit, I will know:</b>
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- Apply understanding of how to strengthen, stiffen and reinforce more complex structures.
- Investigate and analyse a range of existing products
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

- Know how to create a design criterion to inform the design of innovative, functional, appealing products that are fit for purpose.
- Know how to generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, and prototypes.
- Have selected from and used a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.
- Have selected from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities