# TITANIC SCIENCE

## CURRICULUM GRID FOR ENGLAND

These objectives have been taken from the National Curriculum for England.
Titanic Science is aimed at Upper Key Stage two however Year 3 and 4 objectives have been included from the Programme of Study to facilitate the use of this project for Year 5 Forces, as a stimulus for a Science Week and for dipping back to consolidate prior knowledge. It could also be used as a post KS2 SATs programme.

| Lesson | Ideas Explored | KS2 Programme of Study | Skills |
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| **Chapter One Building the Titanic** | *Forces*<br><br>*Pulleys* | **Forces**<br>Yr 3 or 4<br>• Compare how things move on different surfaces.<br>• Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.<br>• To design and make products that use pulleys and explore the effects.<br><br>**Materials**<br>Yr 5 & 6<br>• Give reasons for the particular uses of everyday materials used in the construction of a ship. | Suggest how to make a test fair, identifying what should be changed, measured and kept the same. PS&DM<br>Use a variety of strategies to allow children to work together to develop and use scientific and technological language, for example, through shared investigations. WWO<br>**Working Scientifically-expectations**<br>• I can take measurements, using a range of scientific equipment, with increasing accuracy and precision.<br>• I can report findings from enquiries including oral and written explanations of results involving relationships and conclusions.<br>• I can use scientific models to describe simple scientific ideas.<br>• I can record data and results of increasing complexity using tables and line graphs.<br><br>**Challenge**<br>• I can select appropriate techniques, apparatus and materials during fieldwork and laboratory work, working safely.<br>Analyse and evaluate what has been made with reference to the original design and justify the decisions that have been made, test and improve outcomes. PS&DM<br>Demonstrate skills of working in groups (adopting roles, taking responsibility, managing disagreements); for example, carrying out experiments and investigations or designing models. |

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| **Chapter Two Titanic Strikes the Iceberg** | *Temperature changes*<br><br>*How do de-icers work?*<br><br>*Making slushy drinks* | **Properties and changes of materials**<br>Yr 5 & 6<br>• Demonstrate that dissolving, mixing and changes of state are reversible changes<br>• Explore reversible changes including melting and dissolving recognising that they are different processes.<br>• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the earth and the falling object.<br>• Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.<br><br>**Forces and Magnets**<br>Yr 3 & 4<br>Compare how things move on different surfaces.<br>To gather and record data to answer their questions i.e. 'I wonder how much of the iceberg is underwater.'<br><br>**Living things and their habitats**<br>Recognise that environments can change and that this can sometimes pose dangers to living things<br><br>**States of Matter**<br>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).<br>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.<br>Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. | **Working scientifically**<br>• To make a prediction based on scientific knowledge and understanding<br>• To use test results to make predictions to set up further comparative and fair tests.<br>• To plan enquiries, including recognising and including variables where necessary.<br>• To take measurements, using a range of scientific equipment, with increasing accuracy and precision.<br>• To report findings from enquiries, including oral and written explanations of results and conclusions.<br><br>**Challenge**<br>• To plan and design investigations and experiments to make observations and test predictions.<br>• To present reasoned explanations. |

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| **Chapter Three "We are sinking fast!"** | *Electricity*<br><br>*Switches* | **Electricity**<br>Yr 5 & 6<br>• Compare and give reasons for variations in how components function including the brightness of bulbs, the loudness of buzzers and the on/off position of switches<br>• Use recognised symbols when representing a simple circuit in a diagram<br><br>**Electricity**<br>Yr 3 & 4<br>• To construct a simple series electrical circuit, identifying its name and its basic parts, including cells, wires, bulbs, switches and buzzers.<br>• Recognise that a switch opens and closes a circuit | Identify and describe sequences in an electrical circuits. PS&DM<br><br>**Working scientifically-expectations**<br>• I can use simple models to describe scientific ideas.<br>• I can present findings in written form, displays and other presentations.<br>•<br>**Challenge**<br>• I can evaluate the reliability of methods and suggest and make improvements. |
| **Chapter Four Distress Signals** | *Forces*<br><br>*Chemical reactions*<br><br>*Jump Rockets*<br><br>*Exploding film cases* | **Forces and Energy**<br>Yr 5 & 6<br>• To identify the effects of forces that act between moving surfaces<br>• To experience forces that make things begin to move, get faster or slow down<br>• Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with the action of acid on bicarbonate of soda.<br><br>**Forces and Magnets**<br>Yr 3 & 4<br>To raise questions and carry out tests to find out how far things move in different materials | Make predictions and give reasons based on scientific knowledge and understanding. PS&DM<br><br>**Working Scientifically-expectations**<br>• I can plan enquiries, including recognising and controlling variables where necessary.<br>• I can record data and results of increasing complexity using scientific diagrams, tables, bar charts, line graphs and models.<br>• I can use scientific evidence that has been used to support or refute ideas and arguments.<br><br>**Challenge**<br>• I can identify independent, dependent and control variables when collecting evidence and data.<br>• I can present reasoned explanations. |

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| **Chapter Five Abandon Ship** | *Thermal Properties of materials*<br><br>*Icy water and motor skills* | **Properties and changes of materials**<br>Yr 5 & 6<br>• Compare and group together everyday materials on the basis of their thermal properties<br>• Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials<br><br>**Living things and their habitats**<br>Yr 5 & 6<br>• To observe changes in an animal over a period of time (The effects of cold water on bodies overboard)<br>• Evolution & Inheritance<br>• Identify how animals are adapted to suit their environment in different ways (and that adaptation may lead to evolution) (p53)<br><br>**Living Things**<br>Yr 3 & 4<br>• Recognise that environments can change and that this can sometimes pose dangers to living things | Interpret results by identifying patterns and relate their conclusions to their scientific knowledge and understanding.<br>PS&DM<br><br>**Working scientifically-expectations**<br>• I can take measurements using a range of scientific equipment, with increasing accuracy and precision.<br>• I cam record data and results of increasing complexity using tables, graphs and models.<br>• I can report findings from enquiries, including oral and written explanations of results, relationships and conclusions.<br>• I can use test results to make predictions and set up further comparative and fair tests.<br><br>**Challenge**<br>• I can evaluate the reliability of methods and suggest possible improvements.<br>• I can present reasoned explanations. |

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| **Chapter Six Sinking of Titanic** | *Floating and sinking*<br><br>*Bulkheads* | Understand what the factors affect floating and sinking<br>**Forces**<br>Yr 5 & 6<br>• To explore resistance in water by making and testing boats of different shapes (pg 58-60)<br><br>**Forces and Magnets**<br>Yr 3 & 4<br>• Compare how things move on different surfaces<br><br>**D&T-design**<br>Use research and develop ideas to inform the design of innovative and functional products that are fit for purpose.<br><br>**D&T- Evaluate**<br>Evaluate their own ideas and products against their own design criteria. Consider the views of others to improve their work.<br><br>To understand how key events and individuals in D & T have helped shape the world | Use discussion groups to communicate scientific and technological ideas through correct and precise vocabulary related to the child's stage of development. (Working together)<br>Record and present observations, findings, ideas and solutions in a simple form and use appropriate methods, for example, using lists, simple tables, drawings, diagrams, ICT, photographs or video recordings. (Managing information)<br>**Working scientifically-expectations.**<br>• I can plan enquiries, including recognising and controlling variables.<br><br>**Challenge**<br>• I can ask questions and develop lines of enquiry based on observations.<br><br>**D&T-Make**<br>Select from and use a wider range of tools and equipment to perform practical tasks (e.g.: cutting, shaping, joining and finishing) accurately.<br><br>**D&T -Tech knowledge**<br>To apply knowledge and understanding of how to strengthen, stiffen and reinforce more complex structures. |