Our Science curriculum aims to enthuse children and hep them to be curious and develop a sense of excitement about the world. Through a range of teaching, learning and extra-curricular opportunities, children will develop scientific knowledge and conceptual understanding to recognise the uses and implications of Science, today and for the future. We encourage children to ask their own questions; predict how things will behave and analyse causes, using Science to explain what is happening.

Inspiring and enabling our school community to live life to the full

YEAR 5 SCIENCE

Forces and Mechanisms

Characteristics of an Effective Learner

Courage
Commitment
Collaboration
Creativity
Curiosity

Prior Learning:	**Key Vocabulary taught in this unit:**
-In Keys Stage 1 children learn to understand forces as pushes and pulls. - Children learn about forces in Year 3- how magnetic force can act at a distance and the effect of friction. They begin to learn how to use and read the scale of Newton meters.	Anticlockwise, clockwise, system, accuracy, dependent variable, independent variable, line graph, air resistance, force meter, friction, fulcrum, gears, gravity, impact, lever, load, magnetism, mechanism, Newton (N), oppose, pivot, pulley, water resistance, accurate, comparative test, conclude, conclusion, control variable, enquiry, evaluate, fair test, precise, predict, prediction, refute, support, variable, contact force, force.

Key Questions:
Q What is the friction between different surfaces?
Q Why do some objects fall faster than others?
Q How does the size of the canopy affect the time it takes a parachute to fall?
Q How does the shape of an object affect its movement in water?
Q How does the number of pulleys affect the force needed to lift a load?
Q How does the length of the lever affect the force needed to lift a load?
Q How do gears work?

Intent: What do we want the children to know, be able to do by the time they complete this unit?
Friction is a force that makes it harder to move an object across a surface or slows down an object moving over a surface. The force of friction can be measured using a Newton meter. The unit of measurement of a force is Newtons (abbreviated to N).

Gravity is a force that pulls all objects towards the centre of the Earth. Air resistance is a force that slows down an object moving through air. The amount of air resistance depends on the surface area of the object. It is air resistance, not the object's weight, that affects how quickly an object falls.

This lesson consolidates the understanding that air resistance increases as the surface area of the object moving through the air gets larger**.** The precision of a measurement will depend on the equipment and method used. The accuracy of readings shows how close they are to the true answer and is

improved by taking repeat readings and keeping variables the same.

Water resistance is a force that slows down an object moving through water. The amount of water resistance depends on the shape of the object.

A pulley is a mechanism used for lifting heavy objects (the load) by applying a pulling force at one end of rope attached to the load which passes over a wheel. The more pulleys in the mechanism, the less pulling force is required to lift the load.

A lever is a long, rigid arm that rests on a pivot. A force is applied to one part of the lever to lift the load at another point on the lever. The longer the lever, the less force is required to lift the load.

A gear is a mechanism which consists of wheels with teeth that slot together. Gears change the direction of movement and the force required to make something move. Adjacent gears turn in opposite directions. Smaller gears turn faster than larger gears. A smaller force is needed to turn a smaller gear than a larger gear.

Working Scientifically:
Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
Using test results to make predictions to set up further comparative and fair tests.
Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
Identifying scientific evidence that has been used to support or refute ideas or arguments.

Impact / Outcome:
What will the final product / result be?
Children will learn that scientists collect and interpret data to answer scientific questions to build explanations about the natural world. They consider how trustworthy their data is and how they can improve this. They use their knowledge to make predictions.

P4C Inquiry (where appropriate)