Year 5 Forces
(Physics)

Prior and future learning

Prior Knowledge	What's next?
• I can compare how things move on different surfaces. • I can notice that some forces need contact between two objects, but magnetic forces can act at a distance. • I observe how magnets attract or repel each other and attract some materials and not others. • I can compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. • I can describe magnets as having two poles. • I can predict whether two magnets will attract or repel each other, depending on which poles are facing. (Y3 – Forces) **Revision of these in Y4 Investigation Half term**	• Magnetic fields by plotting with compass, representation by field lines. • Earth's magnetism, compass and navigation. • Forces as pushes or pulls, arising from the interaction between two objects. • Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces. • Moment as the turning effect of a force. • Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water. • Forces measured in Newtons, measurements of stretch or compression as force is changed. (KS3)

Track your learning

How I will show what I have learned	☹	😐	☺
I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.			
I can identify the effects of air resistance, water resistance and friction that act between moving surfaces.			
I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.			

Key knowledge I need to understand

- A force causes an object to start moving, stop moving, speed up, slow down or change direction.
- Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.
- Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object.
- A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines.

Possible texts to read:
Leonardo's dream – *Hans de Beer*

Scientist: Galileo Galilei (Gravity and Acceleration)Isaac Newton (Gravitation)

Working scientifically assessment: Zip line, Marble run, paper planes, aquadynamics

Link to maths curriculum:

Measurement:

- Finding the area of rectangular canopies when exploring the time it takes parachutes to fall to the ground (*Calculate and compare the area of rectangles using standard units cm²)*

Statistics:

- Interpreting data showing how the area of a parachute canopy affects the time it takes to fall. (*Solve comparison, sum and difference problems using information presented in a line graph*).
- Extending a table to record repeat readings when exploring air resistance and water resistance. (*Complete, read and interpret information in tables, including timetables).*

Number:

- Rounding the numbers on a stopwatch that measures in tenths and hundredths of a second to the nearest second when exploring water resistance and air resistance (*Round decimals with 2 dp to the nearest whole number*)

Key vocabulary I need to know	
Force	A push or pull on an object which can cause it to move, change speed, direction or shape. Measured in Newtons (N).
Magnet	A material or object that produces a magnetic field. It attracts or repels magnetic objects, including iron.
Contact force	A force that requires physical contact to occur e.g. kicking a ball.
Attract	To pull towards. Opposite of repel.
Air resistance	Air resistance or drag, acts against gravity on falling objects and this is how parachutes work.
Water resistance	Water resistance is a type of force that uses friction to slow things down that are moving through water.
Lever	A rigid bar resting on a pivot, used to move a heavy or firmly fixed load with one end when pressure is applied to the other.
Weight	The force due to gravity on objects. This force pulls on all objects near the earth. Measured in Newtons (N).
Mass	The amount of matter contained in an object. Measured in units such as g, kg.
Acceleration	Increase in the rate or speed of something.
Pulley	A pulley is a simple machine and comprises of a wheel on a fixed axle, with a groove along the edges to guide a rope or cable. Pulleys are used to reduce the time and energy taken to lift heavy loads.
Gear	Gears are wheels with teeth that slot together. When one gear is turned the other one turns as well.