Year 5: Forces

Kindness Enjoyment Achievement

Key Concepts:	**Types of Enquiry:**	**Vocabulary:**
Gravity is a force of attraction between any two things that have mass; bigger masses exert bigger forces. Gravity works over distance but gets weaker as the distance increases. Stars, planets and moons have so much mass that they exert a large gravitational pull on other things, including each other. Air resistance and water resistance are forces against motion caused by objects having to move air or water out of their way. Gases weigh less than liquids and so water resistance is greater than air resistance. The greater the surface area of a dropping object, the greater the air resistance. Increasing the weight of the falling object can also make it fall faster. Friction is a force against motion caused by 2 surfaces rubbing against each other.	<u>Sorting and classifying:</u> Sort objects: which float and which sink Odd one out: compare and contrast simple machines using gears, pulleys or levers. <u>Fair/ comparative test:</u> Trainer experiment: which treads are best to stop me from slipping? Spinner/ parachute tests: children to develop their own tests. (TAPS Y5 forces spinners) How can you make blutack/ plasticine fall more slowly through water? (TAPS Y5 forces aqua dynamics) What happens when I drop a penny in containers of different liquids? <u>Use of secondary sources:</u> How did Isaac Newton help to develop the theory of gravitation? <u>Change over time:</u> Timeline to indicate the changesin growth and development of humans <u>Pattern seeking:</u> How does altering the length of the wings on a spinner/ area or shape of a parachute affect how long it takes to drop?	Force Gravity Earth Air/ water resistance Friction Mechanisms Simple machines Gear, pulley, lever Pivot/ fulcrum

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<td rowspan="2">Some objects require large forces to make them move; gears, pulleys and levers can reduce the force needed to make things move. The longer the lever, the less effort is required to move a load.
Make a product that involves a lever, pulley or gear.</td>
<td>How does the number of pulleys affect how much effort is needed to lift a weight?</td>
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<td><u>Working scientifically skills:</u>
<u>Questioning:</u>
Raise question and plan an experiment to answer it
Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions.
<u>Observing:</u>
Use newtonmeters to measure force; choose the most appropriate one (they come in different gauges)- read different scales accurately.
<u>Testing:</u>
Make own decisions about what observations to make what measurements to use and how long to make them for
<u>Recording:</u>
Tables, block graph,
Calculate averages over repeat measures.</td>
<td><u>How it fits in with the rest of the curriculum:</u>
Y2: Materials can be changed by squashing, bending, twisting and stretching.
Y3: Compare how things move on different surfaces- car down a ramp covered in different materials; force of friction is caused by 2 surfaces rubbing against each other; notice some forces need contact between 2 objects but that some forces can act at a distance (Mention gravity, but focus on magnetism)
Observe how magnets attract and repel each other. Describe magnets as having 2 poles; sort materials by whether they are magnetic or not.

KS3: opposing forces and equilibrium; weight held by a stretched spring; forces needed to make things start moving or to change their speed or direction of motion; change depending on the direction of force and its size.</td>
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	<u>Communicating:</u> Use relevant scientific language and illustrations to communicate and justify their scientific ideas. <u>Concluding:</u> Use diagrams to exemplify explanations. Look for evidence that refutes or supports their ideas.	