



Topic Title: Forces

Year Group: 5

Academic Year: 2022-2023

Science Intent: Children will be able to explain the effect of gravity on falling, unsupported objects and will be able to identify the effects of air resistance, water resistance and friction between moving surfaces. Children will also understand that some mechanisms allow smaller forces to have greater effects.

Prior Scientific Learning/Linked Topics: Recapping and building on knowledge of forces in Year 3. Developing vocabulary and scientific enquiry.	Literacy Links (including texts/media used): None		Maths Links: Mass and Weight. Units and measurement Shape (Streamlined objects)	
Scientific Knowledge	Working Scientifically			
	Observing and Measuring over time	Identifying, classifying and grouping	Comparative and fair testing (controlled investigations)	Research
<ul style="list-style-type: none">Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.Identify the effects of air resistance, water resistance and friction that act between moving surfaces.Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	<ul style="list-style-type: none">Taking measurements of weight and mass using a range of scientific equipment, with increasing accuracy and precision.	<ul style="list-style-type: none">	<ul style="list-style-type: none">Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.Using test results to make predictions to set up further comparative and fair tests.	<ul style="list-style-type: none">

Content:

- Start – Gravity - Concept cartoon to assess prior learning and starting point.
Discuss cartoon, in pairs and then as a group – put up chns ideas on working all.
- Activity – Marble run investigation – **Problem-solving** – **Observing and measuring** and **Interpreting and communicating results**.
Provide chn with a marble run, a marble and a timer and investigate how to make the marble take the longest time to reach top to bottom.
PP – provide chn with the learning of gravity.
- Activity - Rocket mice conclusions – **Pattern seeking** – **Prediction** and **Evaluating**
Demonstrate rocket mouse: put pre-made mouse on top of plastic bottle and whack bottle with both hands (bottle can be upright/slanted to measure height/distance).
Explain to chn that they need to make their mouse travel the furthest by changing 1 variable.
Size of bottle, size of mouse or type of force.
Provide chn with results sheet to complete.
- Start – Water/air resistance/friction - Air resistance – Running with cardboard
Provide chn with a stop watch. Chn run 20m as fast as they can. Then ask chn to run the same distance with a V large piece of cardboard in front of them and time again. Chn note down the results. Why is there a difference? Class discussion. In books chn write a short report.
- Activity – Aquadynamics test – **Comparative/fair testing**- **Setting up tests** and **Recording data**
- Activity (Friction) - rolling cars on different surfaces – **Comparative / fair testing** – **setting up tests** and **recording data**.



- Start – levers/pulleys/gears/mechanisms – Picture for talking



Pattern-seeking



Problem solving – Asking questions and Evaluating

- Activity – **Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.**
Carousel activity – Allow chn time to investigate each of these.



Chn then draw and write an explanation about how they work.

- How to slow down the ball in the marble run using all the knowledge gained throughout the topic? – (Assessment opportunity) - **Problem solving**

Key Vocabulary:

- Force
- Gravity
- Earth
- Friction
- Air resistance
- Water resistance
- Mechanisms
- Simple machines
- Levers
- Pulleys
- gears

Stunning Start/Marvellous Middle/Fabulous Finish:

Stunning Start:
Mable Runs

Fabulous Finish:
Survival challenge! Shelter building, using pulleys to raise up canopies etc.

OAA/Trips/Visits/Visitors:

InTech/Mobile Planetarium