Forces 2

What's the science story?

Force is a useful idea because it is the key to explaining changes in the motion of an object or in its shape. The motion of an object can be explained or predicted if you know the sizes and directions of all the forces that act on it. Understanding forces helps us to predict and control the physical world around us.

Previous knowledge:

KS2
Year 5 Forces (gravity)
KS3
Year 7 – Forces 1
Year 8 - Pressure

Next steps…

P5 Forces

Keywords

Force	Elastic	Gravity
Contact	Limit	Newton
Non-contact	Extension	Newton meter
Balanced	Length	Weight
Unbalanced	Hooke's Law	Force
Stretch	Elastic limit	Gravity
Compression	Mass	Weightless
Force	Weight	Gravitational field strength

Working scientifically skills:

WS8 – writing and evaluating a given method
WS9 – Writing and identifying variables
WS10 - Selecting and using equipment properly
WS11 – Identifying hazards, risks and precautions
WS13 – Introduce construct own results table
WS14 - drawing a line graph
WS16 – Use a given equation including rearrangement (mass, weight and gravity)
WS17 – Writing a conclusion using evidence

Assessments:

Exit tickets x 2/3 (formative)

- **Details of each exit ticket**
  ET Gravity on different planets

KS3 – Year 9

Lesson No. and Title	Learning objectives	National Curriculum	Practical equipment
1. Forces – Recap *Could take more than 1 lesson depending upon gaps*	ARE – To describe contact and non-contact forces and give examples of each. AGD – To explain the effect forces can have on an object.	• non-contact forces: gravity forces acting at a distance on Earth and in space	
2. Stretching and Compressing - PLAN	ARE – To investigate forces involved in compressing and stretching materials. AGD – To explain the relationship between an applied force and the change of shape of an object.	• opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface	DEMO: Compression Foams block, hard board, masses, metre rulers
3. Stretching and Compressing - PRAC	ARE – To investigate forces involved in compressing and stretching materials. AGD – To explain the relationship between an applied force and the change of shape of an object.		PRAC: Compression Foams block, hard board, masses, metre rulers
4. Hooke's ~Law - PLAN	ARE – To construct an accurate method for a given investigation. AGD – To explore limitations and improve a written method.	• forces: associated with deforming objects; stretching and squashing – springs; • force-extension linear relation; Hooke's Law as a special case	DEMO: Springs Range of springs
5. Hooke's Law - PRAC	ARE – To use Hooke's law to predict the extension of a spring. AGD – To apply Hooke's law to make quantitative predictions with unfamiliar materials.		PRAC: Extension Springs, metre rules, masses, cradles

KS3 – Year 9

6. Mass and Weight	ARE – To define mass and weight. AGD – To explain the link between mass and weight.	• gravity forces acting at a distance on Earth and in space	PRAC: Mass and weight 100g masses, newton meters and cradles
7. Weight on other planets	ARE – To explain the meaning of weightless. AGD – To analyse data about the moon and planets.		