

GCSE Science (Physics) P8 Forces in Balance– Science Faculty

Rationale and Context of Unit:	Core curriculum content:	Tier 2 & Tier 3 vocabulary explicitly taught:
<p>This unit can be taught either at the end of year 10 (then reviewed in Year 11) or as the first unit of Year 11, the short length of this unit allows for this flexibility. It requires a more developed understanding of mathematics including trigonometry so is taught later to allow learners to develop confidence in manipulating numbers.</p> <p>This topic builds on knowledge of work done from P1 (Conservation and dissipation of energy). It also utilises key maths skills such as scale diagrams and trigonometry. Learning on resultant forces will be further developed in P9 (Motion) and P10 (Forces and Motion).</p> <p><i>Unit contains 6 content lessons for Combined Science and 9 lessons for separate sciences.</i></p> <p>AQA GCSE Spec Ref: 4.5.1.1, 4.5.1.2, 4.5.1.4, 4.5.4, 4.5.6.1.1, 4.5.6.1.3, 4.5.6.2.1, 4.5.6.2.2,</p>	<ul style="list-style-type: none"> • Vectors and Scalars • Forces Between Objects • Resultant Forces • Moments at Work • More about levers and gears • Centre of Mass • Moments and Equilibrium • The Parallelogram of forces • Resolution of forces 	<ul style="list-style-type: none"> • <i>Vector</i> • <i>Scalar</i> • <i>Displacement</i> • <i>Force</i> • <i>Resultant</i> • <i>Moment</i> • <i>Lever</i> • <i>Load</i> • <i>Pivot/ Fulcrum</i> • <i>Equilibrium</i> • <i>Centre of Mass</i> • <i>Magnitude</i>
Challenge and Support:	World wide learning/ links to 21 st century:	Cultural capital/ Industry/ Enrichment:
<ul style="list-style-type: none"> • Lessons contain additional support slides for LPA • 2 Pre-Written Extension opportunities included within each lesson • Some practical tasks have additional support sheets for LPAs • Gradient pastel background for improved SEN accessibility 	<ul style="list-style-type: none"> • Racing Car Development • Tesla Motor Company – Safe Cars for the future 	<ul style="list-style-type: none"> • Car design – Why do SUVs roll? (L6) • Life Skills – How do gears work? (L5) • Careers Spotlight – Civil Engineering and Bridge Design

<ul style="list-style-type: none"> • Keyword bank available for SEN • Task timings shown on Ppts for ASD • Triple science specific lessons • Grade 9 questions highlighted and model answers worked through. 		
Historical, Social, Moral, Spiritual, Cultural context:	Cross curricular links/ literacy/numeracy:	Common misconceptions:
<ul style="list-style-type: none"> • History of simple machines (L4,5) 	<ul style="list-style-type: none"> • Cross Curricular – DT simple machines and force multipliers • Numeracy: Trigonometry (Parallelogram of forces), Drawing scale diagrams, Positive and negative numbers • Literacy: Pixl Unlocks available/issued for keywords exploring etymology 	<ul style="list-style-type: none"> • Speed is a scalar quantity, velocity is a vector • Distance is a scalar quantity, displacement is a vector quantity • Mass is a scalar quantity, weight is a vector • Rolling and instability is caused by an objects COM moving outside of it's base/pivot point • A moving object will continue at a steady speed unless an external force acts upon it • Applying force to an object causes it to accelerate • An object with zero resultant force can be at rest or at a constant speed • When calculating moments distance is taken perpendicular to the pivot/at a right angle to the line of action of the force
Assessment timeline:		
<ul style="list-style-type: none"> • Practical skills monitored by teacher when conducting experiments. • Regular low stakes self and peer assessment • Quick check recall tasks as starters/plenaries • PPQs on Forces • End of topic exam to assess pupil progress • Assessed tasks (highlighted above) will have feedback 4 to help improve pupils understanding after they have completed the assessment. 		

Home learning

- HL 1 - Seneca
- HL 2 Past paper Qs (Whole unit)
- Produce revision resources of end of unit assessment

Feedback

- Students will have feedback 4 on one of their practical skills assessments midway through this unit - teacher assessed
- Students will self-assess their home learning ppqs
- Students will have feedback 4 on their end of topic test - teacher assessed
- Students will generate self-feedback 4 on at least one practical activity
- Detailed Seneca Feedback including individual recaps and revision

Length of unit (duration indicated in lessons)

1 C	2 C	3 C	4 S	5 S	6 C	7 S	8 C	9 C	10	11	12
Unit: P8 Forces in Balance											