## Science - Year 7 - Medium term plan - Forces

Year group	Subject: Forces
Prior learning- linked to National curriculum	<ul> <li>First introductory chemistry module where students can explore particles and form the states of matter model.</li> <li>From KS2 students should know: <ul> <li>The force of gravity pulls objects to the Earth.</li> <li>Friction, air resistance, and water resistance all slow things down.</li> <li>some common everyday examples of forces.</li> </ul> </li> </ul>
Covid gaps/MIsconceptions	<ul> <li>Key misconceptions - identified in lesson plans:</li> <li>Anything that is moving has an unbalanced force acting on it. Students often see this as 'common sense'.</li> <li>Unbalanced forces always make things go faster.</li> <li>If anything is stationary it has no forces acting on it.</li> <li>Objects have to be in contact to exert a force on each other.</li> <li>Weight and mass are the same thing.</li> <li>There is no gravity on the moon.</li> <li>Friction is only to do with solids.</li> </ul>
Rationale	<ul> <li>From KS3 National Curriculum- By the end of Yr 9 students should be answer the following:</li> <li>Explain what forces do.</li> <li>Describe how forces deform objects.</li> <li>Use Hooke's law to predict the extension of a spring.</li> <li>Describe the effect of drag forces.</li> <li>Describe the effect of a field.</li> <li>Describe the difference between balanced and unbalanced forces.</li> </ul>
Vocabulary:	Keywords : <u>keyword</u> Copy of P1 Forces glossary.docx
Cultural Capital:	Drawing and labelling graphs

	Analysing data
Key assessments- name the assessments	<ul> <li>Big question (6 mark question) Mid point</li> <li>7P1.2b student worksheet.docx</li> <li>An organiser of a bungee jumping competition changes the length of the bungee rope so different people can use the rope safely. Use your idea of forces to describe how the size of a person affects the rope when they jump.</li> <li>Extra information: The rope is 15 m long and it extends by 3m when an adult jumps. An adult weighs twice as much as a child. (6 marks QWC)</li> <li>End of topic test</li> </ul>
	7P1.7 Forces test.docx - A range of multiple choice, short answer and a long answer question.
What do children know/ can do now (EDSM)	Test marks- Emerging - 20% Developing - 40% Securing - 60% Mastered - 80%
	<ul> <li>Identify non contact forces</li> <li>State what is meant by Hooke's law</li> <li>Describe friction and how to reduce it.</li> <li>State the independent and control variable in an investigation.</li> <li>Describe what is meant by mass and weight.</li> <li>State the forces involved in an interaction pair.</li> <li>Identify the forces acting on an object in a range of situations.</li> <li>Explain using particles how a reaction force works.</li> <li>Apply understanding of forces to new situations.</li> </ul>

	<ul> <li>Design a detailed and suitable scientific investigation to investigate the strength of a bridge.</li> <li>Plot data into a suitable results table.</li> </ul>
What <b>amendments</b> are you going to make following evaluation of this module?	Using elastic bands to demonstrate Hooke's law, it was very confusing (need to use springs instead).

Lesson	Lesson objective	Differentiation	Homework
1	LO: Describe what forces do	<ul> <li>SEND: Sentence starters <ul> <li>Recall questions to consolidate understanding</li> <li>Support sheet</li> <li>Agreed symbols for 'read, write, listen'</li> </ul> </li> <li>Challenge: <ul> <li>Is Gravity the same on Earth and the Moon?</li> <li>Give examples of contact and non contact forces.</li> </ul> </li> <li>Hinge Questions: <ul> <li>Describe the difference between a contact force and non contact force.</li> <li>Name as many forces as you can.</li> <li>What are the things that forces can do?</li> </ul> </li> </ul>	Educake
2	LO: Describe what happens when objects are squashed or	<ul><li>SEND: Sentence starters</li><li>Recall questions to consolidate understanding</li></ul>	Educake

	stretched	<ul> <li>Support sheet</li> <li>Agreed symbols for 'read, write, listen'</li> <li>Challenge: <ul> <li>What is the difference between weight and mass?</li> </ul> </li> <li>Hinge Questions: <ul> <li>Explain what happens when a force is applied and removed?</li> <li>What happens when you stretch a spring?</li> <li>What is the limit?</li> </ul> </li> </ul>	
<u>3</u>	<u>LO: Describe how the size of a person affects the bungee rope</u>	<ul> <li>SEND: Sentence starters <ul> <li>Recall questions to consolidate understanding</li> <li>Support sheet</li> <li>Agreed symbols for 'read, write, listen'</li> </ul> </li> <li>Challenge: What is Hooke's law? <ul> <li>Hinge Questions: How does a person's weight affect the bungee (spring)?</li> <li>Is the extension of a spring affected by the size of a person? If so, will a child/ adult exert more force?</li> </ul> </li> </ul>	Educake -
<u>4</u>	LO: Describe the effect of drag and friction	<ul> <li>SEND: Sentence starters</li> <li>Recall questions to consolidate understanding</li> <li>Support sheet</li> <li>Agreed symbols for <i>'read, write, listen'</i></li> <li>Challenge: <ul> <li>give an example of where friction is useful</li> <li>Hinge Questions:</li> </ul> </li> </ul>	Educake

		<ul><li>Describe what friction is</li><li>and how can we reduce it?</li></ul>	
<u>5</u>	LO: Describe the difference between weight and mass	<ul> <li>SEND: Sentence starters</li> <li>Recall questions to consolidate understanding</li> <li>Support sheet</li> <li>Agreed symbols for <i>'read, write, listen'</i></li> </ul>	Educake
		<ul> <li>Challenge:</li> <li>What unit do we measure mass in?</li> <li>What unit do we measure weight in?</li> <li>Hinge Questions:</li> <li>Describe the meaning of <u>weight</u> and <u>mass</u> mean and give the units for each</li> </ul>	
<u>6</u>	LO: Compare balanced and unbalanced forces	<ul> <li>SEND: Sentence starters</li> <li>Recall questions to consolidate understanding</li> <li>Support sheet</li> <li>Agreed symbols for <i>'read, write, listen'</i></li> </ul>	Educake
		<ul> <li>What is the difference between mass and weight?</li> <li>Hinge Questions:</li> <li>Have you ever played tug of war? Why is it so difficult to win sometimes?</li> <li>State what is meant by the term equilibrium and give some examples</li> </ul>	