



Learning Journey – Y7 Forces and density.

Ad Astra

What have I done previously in my learning journey?		
Previously....	<p>This is the second Physics topic you will have covered at Lode Heath. The forces topic looks at different instances of mechanical energy transfer, and as we will discover throughout the topic Forces and Energy stores are very closely linked.</p> <p>We will look at the science involved in things you will have observed in your everyday life, such as your weight, the stretching of a spring and stopping a fast-moving car. Can you think of any other examples you would like to look at as we study this topic?</p>	
In this topic...	<p>Forces are just pushes and pulls in a particular direction. Forces are shown by arrows in diagrams. The direction of the arrow shows the direction in which the force is acting. The bigger the arrow, the bigger the force. If two forces are balanced, it means the forces are the same size but are acting in opposite directions. If two balanced forces are acting on an object, that object will not change its motion. If it is still, the object will stay still or if it is moving, it will continue moving in the same direction and at the same speed. When two forces acting on an object are not equal in size, we say that they are unbalanced forces. Unbalanced forces do change the way something is moving. They can make objects start to move, speed up, slow down or change direction. In this topic we will look at specific examples of these interactions as well as any calculations used.</p>	
We will develop our learning by studying the following each lesson:		Skills in Science checklist
7F.01 Introduction to forces <ul style="list-style-type: none"> List some forces State that a force may affect the speed, direction or shape of an object and that motion may change depending on the size of the force State that a force acts as a push or a pull, are either contact or non contact, forces may occur when two objects interact and they are measured in Newtons. Identify if a particular force is contact or non contact 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication
7F.02 Balanced and Unbalanced forces <ul style="list-style-type: none"> Describe forces using force arrow diagrams Describe what balanced forces are and what a resultant force is Explain when a force is balanced or unbalanced Calculate a resultant force Interpret resultant forces to predict the effect on an object's motion. 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication
7F.03 Weight and Gravity <ul style="list-style-type: none"> State what is meant by mass and weight Compare the mass and weight of objects on different planets 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication
7F.04 Friction, Air and Water resistance <ul style="list-style-type: none"> Describe the effect of friction, air and water resistance between surfaces Describe useful ways to reduce or increase friction, air or water resistance Describe the energy transfers involved 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication
7F.05 Stopping distances <ul style="list-style-type: none"> Describe what is meant by braking, thinking and stopping distance Describe factors that affect braking, thinking and stopping distance 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication
7F.TA1 Teacher assessed Task 1 <ul style="list-style-type: none"> You will complete a task on the previous topic, Atoms, elements and Compounds. This will help assess how much knowledge you have retained in your long term memory 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication
7F.06 Hooke's Law - Theory <ul style="list-style-type: none"> Describe how objects can be stretched and compressed Write a method to investigate the effect of forces on the extension of a spring 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication



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7F.07 Hooke's Law- Practical <ul style="list-style-type: none"> Describe how objects can be stretched and compressed Write a method to investigate the effect of forces on the extension of a spring 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication
7F.08 Hooke's Law- Conclusion <ul style="list-style-type: none"> Draw conclusions from graphs Describe what is meant by the spring constant Calculate the force needed to extend a spring using Hooke's Law. 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication
7F.09 Density <ul style="list-style-type: none"> Calculate density when given the mass and volume of an object 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication
7F.10 Density (Practical) Regular and irregular shapes <ul style="list-style-type: none"> Describe a practical to find the density of regular and irregular shaped objects Use calculations of density to predict whether an object will float or sink 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication
7F.11 Pressure <ul style="list-style-type: none"> Calculate pressure when given force and area 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication
7F.12 Changing Pressure. <ul style="list-style-type: none"> Describe pressure in terms of particles Describe how pressure changes with depth or height. Describe ways to increase and decrease the pressure 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication
7C.TA2 Teacher Assessed Task 2 <ul style="list-style-type: none"> You will complete a task on the first half of the current topic. This will help assess how much knowledge you have retained in your long term memory. 		<input type="checkbox"/> Scientific Method <input type="checkbox"/> Practical <input type="checkbox"/> Number skills <input type="checkbox"/> Application <input type="checkbox"/> Communication

Key Vocabulary

Force	Speed	Velocity	Direction	Push	Pull	Newton	Contact	Non- Contact
Balanced	Unbalanced	Resultant	Weight	Gravity	Friction	Resistance	Braking	Field strength
Spring Constant		Mass	Surface Area	Compression	Extention	Density	Pressure	Thinking distance

Future Learning	Forces is a large topic that will be looked at as part of your GCSE studies, generally in year 11 In Year 8 , we will look at magnetic forces and how they interact with the earth, as well as studying how things move when a force is applied to them. This will involve calculating the speed and acceleration of various objects.
In careers	Engineers analyse forces when designing a great variety of machines and instruments, from road bridges and fairground rides to atomic force microscopes. Anything mechanical can be analysed in this way. Recent developments in artificial limbs use the analysis of forces to make movement possible.