

Scheme of Learning: Motion and Pressure

Topic Sequence:

1	2	3	4	5	6	7	8	9
Acids & Alkalis	Motion & Pressure	Photosynthesis & Respiration	Metals & Materials	Waves	Inheritance & Evolution	Earth & Atmosphere	Space	Ecosystems & Interdependence

Topic Overview:

In KS2 (primary) pupils are taught to identify the effects of air resistance, water resistance and friction. We build on this with how these forces act between moving surfaces and recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect and compare how things move on different surfaces. In year 7 we have covered the contact and non contact forces as well as the affect of resultant forces on motion. This topic is designed to build upon the knowledge of forces and look at how they affect many different areas of science and how we can use forces to calculate pressure in solids, liquids and gasses as well as moments (the turning force sometimes called torque). The whole topic is set to the context of transport and more specifically global parcel delivery services. Students will have to develop their skill to be able to calculate and analyse data in both numeric and graphical forms.

Lesson Sequence:

This topic leans heavily on calculations and analysis of data. Pupils will start by being asked to remember what they learned during the forces topic in year 7 and state the three effects of a resultant forces on an object. We will move on in that lesson to applying the speed equation to calculate speeds, distances and times. This is then developed by looking at how speed can be represented on a distance/time graph where pupils will need to be able to identify and explain how the gradient of the line represents the speed of the object. We will then look at how forces are also linked to pressure and use the pressure = force/area equation to identify the factor that affects pressure and what happens to objects under high and low pressures. We will develop this further by looking at pressures in fluids and developing our understanding of why some objects will float and other objects will sink. Pupils will then look at pressures in gasses and explain how altitude affects pressure on aircrafts. Pupils will then move on to calculating moments and using the principle of moments to explain why a crane can stay balanced when picking up heavy objects. Finally they will look at how when forces are applied to a spring, work is done and energy is stored in that stretched or compressed object until the force is removed. Pupils will be assessed by 20 multiple choice questions and then required to work out some calculations in a longer answer question.

Sequence of Lessons:

1	Speed
2	Distance/Time graphs
3	Pressure in Solids
4	Pressure in liquids
5	Pressure in gases
6	Moments (a) Calculation and Principle of moments
7	Moments (b) application of knowledge.
8	Work done
9	Assessment

Resources:

1	-
2	Graph work sheet
3	Ice road truckers print out
4	-
5	-
6	Class set: Moments rulers and 0.1N Weights and mass hangers
7	Class Set: Meter rulers, string, plastic cups, 1 x pan balances 0.1N Weights and mass hangers.
8	Class set Springs
9	Assessment Sheets

Supportive Reading:

Comprehension activity	TBC
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Assessment:

Knowledge:	20 question multiple choice quiz
Application of Knowledge:	Extended Calculation task..