KESTEVEN AND SLEAFORD HIGH SCHOOL
Physics Scheme of Learning

Year 10 – Term 6, Physics 11 - Forces and Pressure

Intent – Rationale

Pressure is an important physical quantity—it plays an essential role in topics ranging from thermodynamics to solid and fluid mechanics. As a scalar physical quantity (having magnitude but no direction), pressure is defined as the force per unit area applied perpendicular to the surface to which it is applied. Pressure can be expressed in a number of units depending on the context of use.

Sequencing – what prior learning does this topic build upon?	**Sequencing – what subsequent learning does this topic feed into?**
KS3 Year 7 Topic 2 – Forces and effects KS3 Year 7 Topic 6 – Motion GCSE P8 – Forces in balance GCSE P9 – Motion GCSE P10 – Force and Motion	GCSE P16 – Space (Circular Motion) A-Level: Mechanics
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
	BG4e – Lesson 3 problem solve why object float or sink
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	**What are the opportunities for developing mathematical skills?**

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FROM THE LIBRARY Students should continue to refer to suggested reading resources form previous Schemes of |learning related to this topic.	• Make calculations using ratios and proportional reasoning to convert units and to compute rates (1c, 3c). • Calculate the differences in pressure at different depths in a liquid (1c, 3c). • Calculate relevant values of stored energy and energy transfers; convert between newton-metres and joules (1c, 3c). • Make calculations of the energy changes associated with changes in a system, recalling or selecting the relevant equations for mechanical, electrical, and thermal processes; thereby express in quantitative form and on a common scale the overall redistribution of energy in the system (1a, 1c, 3c).

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Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?

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Know

State the factors that affect the pressure acting on a surface. Calculate the pressure caused by an object resting on a surface, given the force and area of contact. State that pressure can be caused by the action of fluids (liquids and gases) on a surface. Describe the cause of atmospheric pressure in simple terms.

Apply

Describe the effect on the pressure of changing the area of contact or weight acting on a surface. Use rearrangements of the pressure equation to calculate forces or areas of contact. Use SI prefixes in expressions for pressure as appropriate. Use the concept of force, mass, and volume to explain why the pressure increases with depth in a liquid. Describe how atmospheric pressure changes with height.

Extend

Apply the concept of pressure in explaining the effect on a surface, e.g., damage and cutting, in a wide range of contexts. Perform pressure calculations including conversion of areas and forces with SI multiplier prefixes. Use algebraic techniques to derive the equation $p=h\rho g$. Apply the equation for pressure in a liquid to explain the design of dams or other structures. Use the particle model to explain in detail the changes in atmospheric pressure.

What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?
upthrust the upward force that acts on a body partly or completely submerged in a fluid	P11 L4 End of topic Test Teams assignment

Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
1. Pressure & Surfaces	I can explain what pressure means and how to calculate it	Apply the concept of pressure in explaining the effect on a surface,	

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		e.g., damage and cutting, in a wide range of contexts. I can perform pressure calculations including conversion of areas and forces with SI multiplier prefixes.	
2. Pressure in fluids	I can explain how pressure in a fluid increases with liquid depth I can describe the factors affecting pressure in fluids	I can use algebraic techniques to derive the equation $p=h\rho g$. I can rearrange the equation p=hρg to solve a range of questions involving the pressure in a liquid. I can apply the equation for pressure in a liquid to explain the design of dams or other structures.	
3. Up Thrust and Floatation	I can describe what is meant by up thrust on an object in a fluid and what causes it I can explain why an object floats or sinks	I can use the particle model to explain in detail the changes in atmospheric pressure. I can calculate atmospheric pressure using information from a mercury barometer.	
4. End of topic test			