

Meden School Curriculum Planning							
Subject	Physics	Year Group	9	Sequence No.	11	Topic	Pressure, Moments and Density

Retrieval	Core Knowledge	Student Thinking
What do teachers need retrieve from students before they start teaching new content ?	What specific ambitious knowledge do teachers need teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to development of our students thinking, encouraging them to see the inequalities around them and 'do something about them!'
<p>KS2: Levers convert a small force into a big effect.</p> <p>Y7 Forces: Forces can be represented by force diagrams. An arrow tells you the direction the force is acting. The larger the arrow the larger the force.</p> <p>Forces can cause an object to change direction.</p> <p>Forces are measured in Newtons</p> <p>Y7 Physical and Chemical Change: The higher the temperature the faster particles move.</p>	<p>L1: Pressure is the amount of force pushing on a certain area. The bigger the force, the bigger the pressure. The bigger the area, the smaller the pressure. Bulldozers and snow shoes are examples of larger area to reduce pressure.</p> <p>L2: Pressure = Force ÷ Area. The unit of pressure is N/m². The unit of force is N. The unit of area is m².</p> <p>L3: Gases exert pressure on the walls of their containers. The more frequently gas particles hit the walls the higher the pressure. Heating increases the speed of gas particles, resulting in more collisions with the walls and a higher pressure. Pressure in a container tries to balance air pressure, causing objects to expand or shrink. Air pressure is caused by the weight of air above it. It decreases with altitude. A vacuum is when there are no air particles.</p> <p>L4: Caisson disease or the bends can affect people who have been in areas of high pressure. Caisson disease is now known as decompression sickness, it is caused by the sudden release of gases in the body which can cause bubbles to block blood vessels. Low atmospheric pressure causes the following health issues: lack of oxygen which can cause hypoxia; nitrogen trapped in solution in body can cause decompression sickness; risk of embolism as fluid in body begins to boil,</p> <p>L5&6: Liquids exert pressure. Pressure increases with liquid weight and consequently depth. Pressure on object in a liquid is greater underneath the object – this causes the force of upthrust. Liquids are incompressible, so in small systems, where pressure is uniform, force can be transferred from one place to another. This is a hydraulic system. Apply the following formula: force at A x area of A = force at B x area of B.</p> <p>L7: The turning effect of a force is called the moment of the force. The moment is calculated by multiplying the force by the distance from the pivot. The unit of moment is the Newton metre (Nm). The longer a lever the easier it is to turn.</p>	<p>L3 Ideas around why a aeroplane has to have a pressurised cabin</p> <p>L4 Deep sea divers have to be aware of decompression sickness. The ascend slowly and use decompression tables to work out how long they stay at each depth.</p> <p>Felix Baumgartner world record had to overcome low pressure issues.</p> <p>L5&6 Mechanics, construction workers and civil engineers use the principle of hydraulics in their occupations.</p>

	<p>L8: The centre of mass of an object is the single point in which the whole weight can act through. The object will balance about this point. If an object has more than one axis of symmetry, its centre of mass is where the axes meet. A suspended object will come to rest with its centre of mass directly below the point of suspension. The centre of mass of an irregular object can be found by suspended it from 2 separate points, drawing a vertical line down, and finding where they meet.</p> <p>L9: Moments can be described as clockwise or anticlockwise. An object is in balance around a pivot when the sum of the anticlockwise moments equals the sum of the clockwise moments. Levers magnify force and make it easier to move objects.</p> <p>L10: When an object's centre of mass passes its pivot it will topple over. The taller an object is, the higher is centre of mass and the less stable it will be. Stability can be increased by increasing an objects weight.</p> <p>L11: You can calculate if something will float if you know its density. Density relates the mass of a substance to how much space it takes up. Density = mass ÷ volume. Density is measured in kg/m³ or g/cm³.</p> <p>L12: You can calculate the density of an object by finding its mass using a balance and then working out its volume. The volume of a regular object can be calculated mathematically (e.g. height x width x depth for a cuboid). To calculate the volume of an irregular object you calculate the volume of water displaced by the object using a eureka can.</p> <p>L13: Revision</p>	<p>L9 Levers are found in the body.</p> <p>L10 F1 cars and baby high chairs are examples where stability has been increased.</p>
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