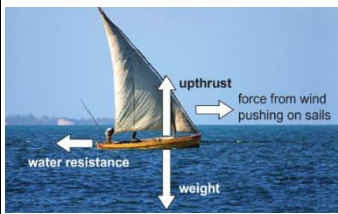


<h1>9I Forces and Motion</h1>	
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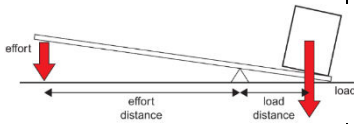
1. Forces and Movement	
<b>Friction</b>	Force between two surfaces sliding across each other.
<b>Reducing Friction</b>	Using rollers or wheels / sleds in snowy countries
<b>Balanced</b>	When a force acting on an object is the same size as the force in the opposite direction.
<b>Constant Speed</b>	Caused by balanced forces acting on an object.
<b>Unbalanced</b>	Forces acting in opposite directions are not equal.
<b>Resultant</b>	The difference between the forward and backward force.
<b>Accelerate</b>	Get faster- caused by unbalanced forces.
<b>Boat Force Diagram</b>	
<b>Drag</b>	Acts to slow down objects moving through fluids (liquids/gases) <i>e.g. water resistance and air resistance</i>
<b>Top Speed</b>	Dependent on the maximum force a vehicle can move forwards an on the friction/drag acting to slow it down.

2. Energy For Movement	
<b>Food</b>	Supplies humans the energy they need.

<b>Solar Energy</b>	Energy stored in food originally came from the Sun.
<b>Kinetic Energy</b>	Stored in anything that is moving.
<b>Fossil Fuel</b>	Fuels formed by remains of plants / animals that store large amounts of energy. <i>e.g. coal, oil, natural gas</i>
<b>Non-Renewable</b>	Resources that will run out one day like fossil fuels.
<b>Using Fossil Fuels</b>	Energy stored in oil and natural gas is used for transport. Energy released by burning fuels is transferred by heating for cooking or keeping warm
<b>Gravitational Potential</b>	Energy stored in raised objects.
<b>Elastic Potential</b>	Energy stored in stretched or squashed objects.
<b>Thermal</b>	Energy stored in the movement of particles. Transferred from hot objects to cooler ones by heating.
<b>Renewable</b>	Resources that will not run out. <i>e.g. wind, moving water</i>
<b>Nuclear Energy</b>	Non-renewable resource used to generate electricity.
<b>Electricity</b>	Cannot be stored, has to be generated by renewable or non-renewable resources.
<b>Conservation of Energy</b>	Energy cannot be created or destroyed, only transferred.
<b>Efficiency</b>	The useful energy transferred compared to the total energy transferred by a device.
<b>Dissipated</b>	Energy that spreads out.
<b>Transfers</b>	Energy is often transferred by heating or sound.

3. Speed	
<b>Speed</b>	How far something can travel in a certain time.

<b>Units</b>	Dependent on measurements taken <i>e.g. miles per hour, metres per second</i>
<b>Speed Formula</b>	$\text{speed} = \frac{\text{distance}}{\text{time}}$
<b>Mean Speed</b>	Total distance travelled, divided by the total time taken.
<b>Distance-Time Graph</b>	Used to show how fast someone travelled during a journey. Also called a displacement-time graph
<b>Displacement</b>	Distance in a straight line between an object and its starting point.
<b>Horizontal Line</b>	Shows an object isn't moving on the distance-time graph.
<b>Steep Line</b>	Shows an object is moving quickly
<b>Relative</b>	Looking speed compared to another object which may be moving.

4. Turning Forces	
<b>Lever</b>	Long bar used to life heavy objects.
<b>Pivot / Fulcrum</b>	Point that the lever turns around.
<b>Effort</b>	Force applied down on lever.
<b>Load</b>	The object being lifted.
<b>Lever Diagram</b>	
<b>Force Multiplier</b>	Effort distance is greater than the load distance meaning that the effort force is smaller than the force lifting the load.
<b>Distance Multiplier</b>	Large effort force moves a small distance and the load is moved a greater distance.
<b>Moment</b>	The turning effect of a force.

<b>Units</b>	Moments are measured in newton metres ( <b>N m</b> )
<b>Moment Formula</b> moment of the force (N m) = force (N) × perpendicular distance from the pivot (m)	
<b>Equilibrium</b>	Opposing forces are balanced.
5. More Machines	
<b>Machine</b>	Anything that helps us work with forces.
<b>Ramp</b>	A simple machine that means less force is needed to push an object up a slope compared to lifting.
<b>Pulleys</b>	Makes lifting a load easier by pulling down a rope.
<b>Work</b>	Amount of energy transferred when a force moves something.
<b>Units</b>	Work is measured in Joules ( <b>J</b> )
<b>Work Done Formula</b> work done (J) = force (N) × distance moved in the direction of the force (m)	
<b>Conservation of Energy</b>	If a smaller force is needed to move something, the force has to move through a greater distance.

Lesson	Memorised?
1. Forces and Movement	
2. Energy For Movement	
3. Speed	
4. Turning Forces	
5. More Machines	