Year 8 Science knowledge organiser

Module – Force
Topic – Contact forces and pressure
Length of topic – Approx. 10 lessons
Method of assessment – Summative assessment

Links to prior learning

KS2 Year 5 Forces topic

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.
- Recognise that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs, allow a smaller force to have a greater effect.

Knowledge to be taught.

- When the resultant force on an object is zero, it is in equilibrium and does not move, or remains at constant speed in a straight line.
- One effect of a force is to change an object's form, causing it to be stretched or compressed.
- In some materials, the change is proportional to the force applied.
- Pressure acts in a fluid in all directions. It increases with depth due to the increased weight of fluid, and results in an upthrust.
- Objects sink or float depending on whether the weight of the object is bigger or smaller than the upthrust.
- Different stresses on a solid object can be used to explain observations where objects scratch, sink into or break surfaces.

Skills to be covered

- Sketch the forces acting on an object, and label their size and direction.
- Use the formula: fluid pressure, or stress on a surface = force (N)/area (m2).

Working scientifically strands covered

Analyse patterns	✓
Discuss limitations	✓
Draw conclusions	✓
Present data	✓
Communicate ideas	✓
Construct explanations	✓
Critique claims	
Justify opinions	
Collect data	✓
Devise questions	✓
Plan variables	✓
Test hypothesis	✓
Estimate risks	
Examine consequences	
Review theories	
Interrogate	

Assessment

Summative assessment based on knowledge taught through the topic

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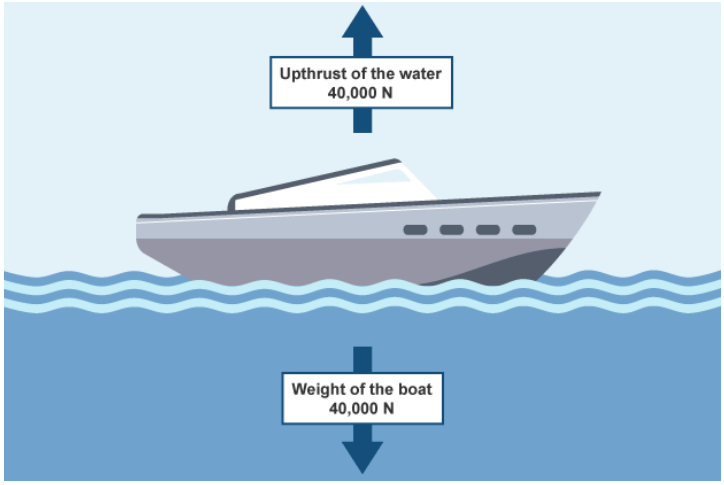
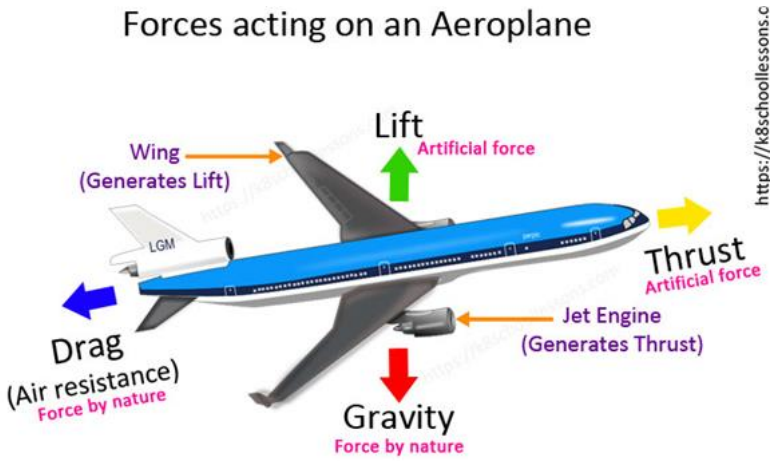
Facts

Forces can be contact forces, where objects must touch each other to exert a force.

When two forces acting on an object are equal in size but act in opposite directions, we say that they are balanced forces.

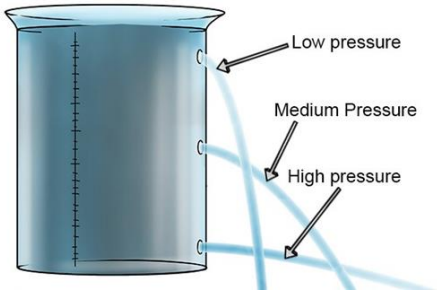


Air resistance is caused by the frictional forces of the air against the vehicle. The faster the vehicle moves, the bigger the air resistance becomes.



Skiers increase the area in contact with the snow by using skis.

Pressure in liquids increases with depth, so the deeper you go the greater the pressure.



Keywords

Air resistance: A force of friction produced when an object moves through the air.
Atmospheric pressure: The weight of air resting on the Earth's surface.
Balanced force: When the total force in opposite directions are equal in magnitude. For example, with a thrust of 15 N and a frictional force of 15 N, the body experiences balanced forces.
Compression: Being squashed.
Deformation: Changing shape and/or size as a result of forces being applied.
Effort: Force used to move a load over a distance.
Equilibrium: State of an object when opposing forces are balanced.
Extension: Increase in length, for example, as a result of being pulled.
Fluid: A substance that can flow, such as a liquid or a gas.
Force: A push or a pull. The unit of force is the newton (N).
Frictional force: Force that resists one object moving through or over something. An example is air resistance on a car.
Hooke's Law: Law describing that the extension of an object or material is directly proportional to the force applied.
Moment: A turning effect of a force.
Newton: Unit of force named after British scientist Isaac Newton (1642-1727), eg the frictional force on the boat is 20,000 N.
Pressure: Force exerted over an area. The greater the pressure, the greater the force exerted over the same area.
Reaction force: Force exerted in the opposite direction to an action force.
Resultant force: The single force that could replace all the forces acting on an object, found by adding these together. If all the forces are balanced, the resultant force is zero.
Tension: Pulling force exerted by each end of an object such as a string or rope.
Upthrust: Upwards force exerted by a liquid or gas on an object floating in it.