

Definitions and Concepts for Edexcel Physics GCSE

Topic 9: Forces and Their Effects

*Definitions in **bold** are for higher tier only*

Definitions marked by '' are for separate sciences only*

Balanced Forces: A resultant force of zero.

Contact Force: A force that acts on an object through physical contact.

Electric Field: A region where a charge will experience a non-contact electrostatic force.

Equilibrium: An object in equilibrium has a zero resultant force and a zero resultant moment.

Force Field: A region where an object will experience a non-contact force.

Force Vectors: An arrow that represents a force. The length represents the force's magnitude and the arrowhead shows the direction in which it acts.

Free Body Diagram: A visual representation of the forces that act on an object.

Friction: A resistive contact force that acts to oppose the relative motion between two surfaces.

***Gears:** A simple mechanism that can transmit the rotational effect of a force.

Gravitational Field: A region where a mass will experience a non-contact gravitational force.

***Lever:** A simple mechanism that can transmit the rotational effect of a force.

Lubrication: The application of a lubricant (such as oil) to reduce the friction that acts between surfaces. This may improve the efficiency of a system.

Magnetic Field: A region where a magnetic material will experience a non-contact magnetic force.

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***Moment:** The turning effect of a force, equal to the product of the magnitude of the force and the perpendicular distance from the pivot to the line of action of the force.

Newton Metre: The unit of a moment.

Non-Contact Force: A force that acts on an object at a distance. There is no physical contact, and instead the force acts through a field.

***Principle of Moments:** For an object in equilibrium, the sum of the clockwise moments about any point on the object must equal the anticlockwise moments about that same point.

Resolution of Forces: All forces can be resolved into two perpendicular components that have the same effect as the single force.

Resultant Force: The single force that can replace all the individual forces acting on an object, and have the same effect.

***Resultant Moment:** The single moment that has the same effect as the sum of all the other clockwise and anticlockwise moments acting on an object.

Scalar Quantities: Quantities that only have a magnitude, not a direction.

Vector Quantities: Quantities that have both a magnitude and direction. They are represented by an arrow, with the length representing the magnitude and the arrowhead representing the direction.

