

**Gravitational fields**

Specification reference	Checklist questions	
5.4.1 a	Can you understand gravitational fields being due to mass?	<input type="checkbox"/>
5.4.1 b	Can you state the mass of a spherical object modelled as a point mass at its centre?	<input type="checkbox"/>
5.4.1 c	Can you describe gravitational field lines to map gravitational fields?	<input type="checkbox"/>
5.4.1 d	Can you calculate gravitational field strength; $g = \frac{F}{m}$ ?	<input type="checkbox"/>
5.4.1 e	Can you explain the concept of gravitational fields as one of a number of forms of field giving rise to a force?	<input type="checkbox"/>
5.4.2 a	Can you state Newton's law of gravitation?	<input type="checkbox"/>
5.4.2 a	Can you calculate the equation $F = - \frac{GMm}{r^2}$ ?	<input type="checkbox"/>
5.4.2 b	Can you calculate gravitational field strength $g = - \frac{GM}{r^2}$ for a point mass?	<input type="checkbox"/>
5.4.2 c	Can you understand the uniformity of gravitational field strength close to the surface of the Earth and its numerical equivalence to the acceleration of free fall?	<input type="checkbox"/>
5.4.3 a	Can you explain Kepler's three laws of planetary motion?	<input type="checkbox"/>
5.4.3 b	Can you calculate the centripetal force on a planet from the gravitational force between it and the Sun?	<input type="checkbox"/>

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5.4.3 c	Can you calculate the equation $T^2 = \left(\frac{4\pi^2}{GM}\right)r^3$ ?	<input type="checkbox"/>
5.4.3 d	Can you describe the relationship for Kepler's third law $T^2 \propto r^3$ applied to systems other than our Solar System?	<input type="checkbox"/>
5.4.3 e	Can you explain geostationary orbit and the uses of geostationary satellites?	<input type="checkbox"/>
5.4.4 a	Can you describe gravitational potential at a point as the work done in bringing unit mass from infinity to the point?	<input type="checkbox"/>
5.4.4 b	Can you calculate the expression for gravitational potential at a distance $r$ from a point mass $M$ ?	<input type="checkbox"/>
5.4.4 c	Can you describe a force–distance graph for a point or spherical mass; work done as area under graph?	<input type="checkbox"/>
5.4.4 d	Can you describe changes in gravitational potential?	<input type="checkbox"/>
5.4.4 e	Can you explain escape velocity?	<input type="checkbox"/>