Fields

Checklist statement	✓
I can explain the concept of a force field as a region in which a body experiences a non-contact force.	☐
I can explain that a force field can be represented by a vector and that its direction is determined by inspection.	☐
I can explain that force fields arise from the interaction of mass, static charge and moving charges.	☐
I can compare gravitational and electrostatic forces, identifying similarities and differences.	☐
I can explain that both gravitational and electrostatic forces follow inverse-square laws.	☐
I can explain that masses always attract, whereas charges may attract or repel.	☐

Newton's Law of Gravitation

Checklist statement	✓
I can explain gravity as a universal attractive force acting between all matter.	☐
I can apply $F = \frac{Gm_1m_2}{r^2}$, define all terms and know their standard units.	☐
I can estimate the magnitude of gravitational forces between objects.	☐

Gravitational Field Strength

Checklist statement	✓
I can describe a gravitational field using gravitational field lines.	☐
I can define gravitational field strength as force per unit mass.	☐
I can apply $g = \frac{F}{m}$, define all terms and know their standard units.	☐
I can apply $g = \frac{GM}{r^2}$ for a radial gravitational field, define all terms and know their standard units.	☐

Gravitational Potential

Checklist statement	✓
I can define gravitational potential, including the reference of zero potential at infinity.	☐
I can define gravitational potential difference.	☐
I can apply $\Delta W = m\Delta V$, define all terms and know their standard units.	☐
I can explain equipotential surfaces and why no work is done when moving along them.	☐
I can apply $V = -\frac{GM}{r}$, define all terms and know their standard units.	☐
I can explain the significance of the negative sign in gravitational potential.	☐
I can interpret graphs showing how gravitational field strength and gravitational potential vary with distance.	☐
I can apply the relationship $g = -\frac{\Delta V}{\Delta r}$, define all terms and know their standard units.	☐
I can determine gravitational potential difference from the area under a graph of g against r.	☐

Orbits of Planets and Satellites

Checklist statement	✓
I can explain how orbital speed and orbital period depend on the radius of a circular orbit.	☐
I can explain the relationship $T^2 \propto r^3$ for circular orbits.	☐
I can describe the energy considerations for an orbiting satellite.	☐
I can explain the total energy of an orbiting satellite.	☐
I can explain escape velocity.	☐
I can describe synchronous orbits.	☐
I can explain the use of satellites in low Earth orbits and geostationary orbits.	☐
I can describe the plane and radius of a geostationary orbit.	☐