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| **Lesson Number: 21.2** | | |
| **Lesson Title: Gravitational Potential** | | |
| **Specification Reference** | | **3.7.2.2 / 3.7.2.3** |
| **Learning Objectives** | | |
| Understanding of definition of gravitational potential, including zero value at infinity  Understanding of gravitational potential difference  Work done in moving mass *m* given by Δ*W* = *m*Δ*V*  Equipotential surfaces  Idea that no work is done when moving along an equipotential surface  Significance of the negative sign  Graphical representations of variations of *g* and *V* with *r*  *V* related to *g* by: | | |
| **Opportunities for Assessment** | | |
| Page 342 questions | | |
| **Starter:** | Slide #1allows a discussion of rocket fuel, energy changes, does anything escape gravity? | |
| **Main:** | Slide #2 links back to projectile motion from Year 1 to discuss the effect of increasing speed and hence kinetic energy on the height attained by a projectile  Slide #3 Defines gravitational potential energy – students often struggle to understand why potential energy is zero at infinite distance  Slide #4 reaffirms the definition from the previous slide and tests their knowledge of units  Slide #5 shows equipotentials – link to hill walking, gradients and DofE (Some OS maps might come in handy here if you have any)  Slides #6 and #7 explain equipotentials and how they are not evenly spaced; this will therefore give rise to a changing gradient at different places – link back to contour lines and gradient from how close they are | |
| **Plenary:** | Slide #8 is a summary | |

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| **Homework:** | Page 342 questions, Research Isaac Newton and his Theory of Gravitation | |
| **Differentiation / Extension / S&C** | | |
| Use of maps to find the gradient of slopes | | |
| **Numeracy / Literacy** | | **SMSC / Fundamental British Values** |
| Use of formulae and gradients | | DofE, route planning and gradients |
| **RESOURCES:** | | |
| Optional – OS Maps | | |
| **Risk Assessment** e.g. CLEAPSS card reference | | |
| None | | |
| **Working Scientifically (HSW)** | | |
| None | | |