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| **Lesson Number: 22.4** |
| **Lesson Title: Coulomb’s Law** |
| **Specification Reference** | **3.7.3.1** |
| **Learning Objectives** |
| Force between point charges in a vacuum: Permittivity of free space, Appreciation that air can be treated as a vacuum when calculating force between charges.Comparison of magnitude of gravitational and electrostatic forces between subatomic particles.For a charged sphere, charge may be considered to be at the centre. |
| **Opportunities for Assessment** |
| Page 371 questions |
| **Starter:** | Slide #1 revisits the work done on field lines and equipotentials and extends them to point charges. Link to the equipotentials in a gravitational field around a planet |
| **Main:** | Slide #2 is simply historical data about Coulomb, this could be a homework idea for researchSlide #3 defines Coulomb’s Law, try and enable pupils to discover this formula for themselves. For more able group use the data on page 369 to draw a graph and then find the inverse square law themselves and hence the overall expression for force.Slide #4 defines the constant of proportionality and the permittivity of free space constantSlide #5 shows the pupils the differences in a the strength of gravity and electric forces |
| **Plenary:** | Slide #6 is summary |
| **Homework:** | Page 371 questions, Research Coulomb and his experiments |
| **Differentiation / Extension / S&C** |
| Enable more able pupils to discover the relationship between force and distance and hence define the formula themselves |
| **Numeracy / Literacy** | **SMSC / Fundamental British Values** |
| Formula and constant use, extensive use of units and scientific notation. Comparison between forces | Links between Newton’s laws and Coulomb’s law. Building upon past work and similar ideas. |
| **RESOURCES:** |
| None |
| **Risk Assessment** e.g. CLEAPSS card reference |
| None |
| **Working Scientifically (HSW)** |
| Why does Salt dissolve? Page 370 – research / discussion / links to Chemistry |

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