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| **Lesson Number: 22.2** |
| **Lesson Title: Electric Field Strength** |
| **Specification Reference** | **3.7.3.1, 3.7.3.2** |
| **Learning Objectives** |
| Permittivity of free space, Electric field strength.*E* as force per unit charge defined by Magnitude of *E* in a uniform field given by Derivation from work done moving charge between plates: *Fd* = *Q*Δ*V* |
| **Opportunities for Assessment** |
| Page 365 questions |
| **Starter:** | Slide #1 is an introduction to electric field strength – parallels may be drawn with previous work on gravitational fields. It is important that pupils *understand* what it is they are trying to measure and can quantify their answers by hypothesising the units |
| **Main:** | Slide #2 is an animated work through deriving the main formulaSlide #3 has the important main three bullet points needed when describing the field between parallel plates – students *should* be able to come up with these before seeing them!Slide #4 and #5 work through to derive the formula  Slide #6 is an extension into what the permittivity of free space is. Although the constant is needed, a definition is not nor is its derivation. |
| **Plenary:** | Slide #7 is a summary |
| **Homework:** | Page 365 questions; research on lightning and lightning conductors |
| **Differentiation / Extension / S&C** |
| Research on the permittivity of free space and its use in other physics constants (e.g. the speed of light) |
| **Numeracy / Literacy** | **SMSC / Fundamental British Values** |
| Derivation of formulae and units | None |
| **RESOURCES:** |
| None |
| **Risk Assessment** e.g. CLEAPSS card reference |
| None |
| **Working Scientifically (HSW)** |
| See “The lightning conductor” on page 363 |