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| **Lesson Number: 23.4** |
| **Lesson Title: Dielectrics** |
| **Specification Reference** | **3.7.4.2** |
| **Learning Objectives** |
| Dielectric action in a capacitor Relative permittivity and dielectric constant.Students should be able to describe the action of a simple polar molecule that rotates in the presence of an electric field. |
| **Opportunities for Assessment** |
| Page 391 questions |
| **Starter:** | Slide #1 links back to static electricity and inducing a dipole effect in neutral molecules |
| **Main:** | Slide #2 shows how a dielectric fits between the plates and what its function isSlides #3 and #4 explain the calculation of the dielectric constant as well as some examplesSlide #5 contains important exam points on capacitor design and then defines the formula based on them – note that the permittivity of free space is epsilon noughtSlide #6 is a brief outline of the three main polarisation methods – see page 390 of the course book for more details (possible research homework)Slide #7 highlights the order in which the three mechanisms decrease in an alternating field |
| **Plenary:** | Slide #8 is a summary |

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| **Homework:** | Page 391 questions, research polarisation mechanisms |
| **Differentiation / Extension / S&C** |
| Discuss the idea of inertia and why the polarisation mechanisms decrease in the order that they do |
| **Numeracy / Literacy** | **SMSC / Fundamental British Values** |
| Formula use and ratios | Capacitor applications and design, linking physics to engineering |
| **RESOURCES:** |
| Optional – An old capacitor, large style, opened up to see the construction |
| **Risk Assessment** e.g. CLEAPSS card reference |
| None |
| **Working Scientifically (HSW)** |
| Page 391 – capacitor applications |

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