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**LANGDON PARK SIXTH FORM**

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| **Subject: Physics** | **Year: Y13** | **Topic: 3.7.4 Capacitors** |

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| ***What and Why*** “What is a capacitor? What are their uses in industry? Why are capacitors important? They can be used as an energy store for camera flash; car audio for the amplifier; radio tuning” |

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| **Key terms**  Ampere  Capacitance  Charge  Coulomb | Current  Dielectric  Discharge  Electric field  Energy | Exponential decay  Exponential function  Farad  Parallel plate  Polar molecule | Potential difference  Relative permittivity  Resistor  Time  Time constant |

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| **Specification point** | **Pre-reading** | **Application and Assessment (date)** | **Home learning** | **Extension – Cultural Capital and Reading** |
| **3.7.4.1:** I can define capacitance.  **3.7.4.2**: I can describe the action of a simple  polar molecule that rotates in the presence of an electric field and apply the dielectric equation. **3.7.4.3:**  I can Interpretation of the area under a graph of charge against pd.  **3.7.4.4:**  I can graphically represent the charging and discharging of capacitors through resistors for *Q*, *V* and *I* against time for charging and discharging and interpret the gradients and areas under graphs.  I can apply the exponential equation for discharge  and charging of a capacitor.  I can calculate the time constant and the time to halve. | Use the Oxford AQA A2 textbook p.110 to 121. Look at other textbooks in the library for alternative ideas, explanations and diagrams.  **YouTube Videos:**  (1) [How Capacitors Work](https://www.youtube.com/watch?v=5hFC9ugTGLs)  (2) [Exponential decay of a capacitor](https://www.youtube.com/watch?v=-KY8DTCkN6s)    **Websites:**  [**https://physicsabout.com/capacitance/**](https://physicsabout.com/capacitance/)  [**https://www.s-cool.co.uk/a-level/physics/capacitors/revise-it/charging-and-discharging**](https://www.s-cool.co.uk/a-level/physics/capacitors/revise-it/charging-and-discharging) | **Practicals:**  (1) Required practical 9:  Investigating the discharge of a capacitor  (2) Investigating the relationship between energy and pd for a capacitor  **Assessment**:  Minitest Capacitors (4th week Nov) | (1) Plot a graph of Energy v pd from experiment and write a conclusion. Calculate the uncertainty in pd and add error bars to the graph  Make notes on each topic and complete the exam style practice questions | (1) Find out about exponential  decay in real life.  (2) Find out how capacitors are  used in industry  **Reading:**  Leonhard Euler: Mathematical  Genius in the Enlightenment  By Ronald S. Calinger |

**Pre-assessment content review**

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| I feel secure in | I need to focus on | My action plan |

**Pre-assessment skills review**

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| I feel secure in | I need to focus on | My action plan |

**Post-assessment review**

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| Weaknesses in content knowledge | Skills I need to focus on | My action plan |
| Retest / review – teacher and student comment | | |

**Revision planning**

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| Spec point | Notes complete | Revision materials | Past paper Qs | Timed conditions |
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