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**LANGDON PARK SIXTH FORM**

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| **Subject: Physics** | **Year: Y12** | **Topic: 3.2.2 Quantum Phenomena** |

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| ***What and Why*** “The behavior of particles is different compared to that in the macroscopic world. We can investigate the nature of particles by applying the Photoelectric Effect and using the idea of Energy Levels in atoms.” |

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| **Key terms**  De-excitation  Diffraction  Electronvolt  Energy level  Excitation | Excited state  Fluorescence  Frequency  Ground State  Ionisation  Kinetic energy | Line spectra  Momentum  Particle nature  Photocell  Photoelectron  Photon | Planck’s constant  Stopping voltage  Threshold frequency  Wave nature  Wavelength  Work function |

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| **Specification point** | **Pre-reading** | **Application and Assessment (date)** | **Home learning** | **Extension – Cultural Capital and Reading** |
| **3.2.2.1:** I can use the Photoelectric equation and explain the concept.  **3.2.2.2:** I understand the concept of ionization and how the fluorescent tube works.  **3.2.2.3:** I can describe energy levels and convert J to MeV  3**.2.3.4:** I canexplain the Wave-Particle duality of the electron and photon. Use the de-Broglie equation | Use the Oxford AQA AS textbook p.32 to 47. Look at other textbooks in the library for alternative ideas, explanations and diagrams.  **YouTube Videos:**  (1) The Photoelectric Effect  (2) Wave-Particle Duality  (3) Line Emission Spectra    **Websites:**  <https://isaacphysics.org/concepts/cp_photoelectric_effect>  <https://www.cyberphysics.co.uk/topics/atomic/DeBroglie/DeBroglie.htm>  <https://phet.colorado.edu/en/simulations/category/physics> | **Practicals:**  (1) Investigate electron diffraction using a Cathode Ray Tube  (2) Observe line emission spectra using an electroscope  **Assessment**:  Minitest on Quantum Phenomena (2nd week Oct)  Multiple choice test on Particles and Quantum Phenomena (3rd week Oct) | (1) Describe the Photoelectric Effect  (2) Explain how line spectra form  (3) Recall the definition of key terms  Make notes on each topic and complete the exam style practice questions | (1) What is Quantum Physics and  how does it apply to our everyday  life?  (2) What is the role of Line  Spectra in Astrophysics?  **Reading:**  The Quantum Universe:  Everything that can happen does happen. By Brian Cox |

**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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