Edexcel International GCSE Physics 4PH1 Learning Plan

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| **Unit: 6 Magnetism and Electromagnetism** | **Chapter: 21. Electric motors and electromagnetic induction** | **Hours: 4** |
| Content coverage | Learning outcomes | Resources | Assessment |
| Section 6: Magnetism and Electromagnetismc) Electromagnetismd) Electromagnetic induction | **6.11P know that there is a force on a charged particle when it moves in a magnetic field as long as its motion is not parallel to the field** **6.12** understand why a force is exerted on a current-carrying wire in a magnetic field, and how this effect is applied in simple d.c. electric motors and loudspeakers **6.13** use the left-hand rule to predict the direction of the resulting force when a wire carries a current perpendicular to a magnetic field **6.14** describe how the force on a current-carrying conductor in a magnetic field changes with the magnitude and direction of the field and current **6.15** know that a voltage is induced in a conductor or a coil when it moves through a magnetic field or when a magnetic field changes through it and describe the factors that affect the size of the induced voltage **6.16** describe the generation of electricity by the rotation of a magnet within a coil of wire and of a coil of wire within a magnetic field, and describe the factors that affect the size of the induced voltage **6.17P describe the structure of a transformer, and understand that a transformer changes the size of an alternating voltage by having different numbers of turns on the input and output sides** **6.18P explain the use of step-up and step-down transformers in the large-scale generation and transmission of electrical energy** **6.19P know and use the relationship between input (primary) and output (secondary) voltages and the turns ratio for a transformer:** **input (primary) voltage** = **primary turns output (secondary) voltage secondary turns** **6.20P know and use the relationship: input power = output power** ***Vp Ip*** =***Vs Is*for 100% efficiency**  | Video and Powerpoint:5.8 Electromagnetic effects (1)5.9 Electromagnetic effects (2) Textbook pages:Page 207 – Movement from electricityPage 210 – Electromagnetic inductionPage 210 – Demonstrating electromagnetic inductionPage 211 – GeneratorsPage 212 – The transformerPage 213 – Using transformers to change voltagesPage 213 – Energy in transformersPage 214 – Transformers and national grids  | Pages 215 – 216Questions (1) to (7)Pages 217 – 219 End of Unit Questions (1) to (7)Chapter 21 Textbook Answers (PDF)Chapter 21 Answers to End of Unit Questions (PDF)Chapter 21 - exam question - pdfChapter 21 - exam question mark scheme – pdfChapter 21 - Talking paper video  |

Videos – [www.igcsesciencecourses.com](http://www.igcsesciencecourses.com)

Textbook Ref: Edexcel International GCSE (9-1) Physics Student Book - Pearson (Arnold, Johnson, Woolley))