12 Physics - Module 6: Electromagnetism

#	Learning Intention The goal of this lesson is to...	Success Criteria I will know I have achieved this goal when I can...
1	Analyse the behaviour of charged particles in electric and magnetic fields	1. Describe the force on a charged particle in an electric field 2. Calculate the force on, acceleration of and work done on a charged particle due to an electric field 3. Model the trajectory of a charged particle in an electric field 4. Analyse the motion of a charged particle in a magnetic field 5. Calculate the force on a charged particle due to a magnetic field 6. Compare the motion of charged particles in magnetic fields to the motion in electric fields
2	Analyse the interaction between a current-carrying conductor and a magnetic field	7. Describe the factors that influence the force experienced by a current-carrying conductor in a magnetic field 8. Calculate the force between parallel current-carrying conductors 9. Compare the force between parallel current-carrying conductors and Newton's Third Law of Motion
3	Analyse the relationship between electric and magnetic fields	10. Describe the concept of magnetic flux and how it changes 11. Define Faraday's Law 12. Analyse Faraday's Law qualitatively and quantitatively 13. Define Lenz's Law 14. Analyse Lenz's Law qualitatively and quantitatively 15. Apply Faraday's Law and Lenz's Law to a variety of situations. For example; straight conductors, solenoids and metal plates 16. Apply the Law of Conservation of Energy to the production of a current
4	Understand how a transformer works	17. Apply Faraday's Law and Lenz's Law to a transformer 18. Describe the components of a transformer 19. Analyse the operation of an ideal transformer

		20. Identify the production of eddy currents in a transformer 21. Evaluate the role of eddy currents in the operation of a transformer 22. Describe how the heating effects of eddy currents can be reduced 23. Analyse the application of transformers in electrical energy distribution
5	Understand the operation of DC and AC motors and generators	24. Define the Motor Effect 25. Describe the components of an AC and a DC motor 26. Calculate the torque in a DC motor 27. Describe the origin of a back EMF in a DC motor 28. Describe the components of DC and AC generators 29. Describe the components of AC induction motors
6	Apply Lenz's Law and the Law of Conservation of Energy to motors	30. Relate Lenz's Law to the operation of a DC motor 31. Relate the Law of Conservation of Energy to a DC motor 32. Apply Lenz's Law to electromagnetic brakes 33. Apply the Law of Conservation of Energy to electromagnetic brakes

Students please complete STUDENT EVALUATION FORM at the end of the unit.