جيمس مدرسة فاوندرز دبي GEMS Founders School DUBAI

Year	13
Subject	Physics

High Performance Learning

Term	Date	Focus	Summary	Learning Outcomes
Term 2	02/01/23	Unit 3 Capacitance Unit 4 Thermal physics	Unit 3 Dielectrics Unit 4 Thermal energy retrieval practice	Unit 3 Explain how a dielectric affects a capacitor. Define relative permittivity and dielectric constant. Describe the action of a simple polar molecule rotating in an electric field. Describe and interpret the shape of the Q–t charging curves and the shape of the Q–t discharging curves. Explain which circuit components you would change to make the charge/ discharge slower. Define the time constant of a capacitor–resistor circuit Unit 4 - thermal Retrieval Practice and Feedback Evaluate your learning of the content explored in Unit 4 to identify your areas of development
	09/01/23	Unit 3 Capacitance Unit 4 Rotational Dynamics	Unit 3 Dielectrics Required Practical Unit 4 Acceleration	Unit 3 Discuss whether a radioactive source can decay completely. Define exponential decrease. Explain why a radioactive decay is a random process
	16/01/23	Unit 3 Decay laws Unit 4 Rotational Dynamics	Unit 3 Decay rules with capacitance and nuclear decay Unit 4 Acceleration Torque	Unit 3 Discuss whether a radioactive source can decay completely. Define exponential decrease. Explain why a radioactive decay is a random process Unit 4 Define angular acceleration. Calculate the angular acceleration of a rotating object when it speeds up or slows down. Calculate the number of turns a rotating object makes in a certain time when it accelerates uniformly. Define torque. Explain moment of inertia. Describe how angular acceleration of a rotating object depends on its moment of inertia.
	23/01/23	Unit 3 Magnetic Fields Unit 4 Rotational dynamics	Unit 3 Conductors in a magnetic field Moving charges in a magnetic fields Unit 4 KE Angular momentum and Impulse	Unit 3 Measure the strength of a magnetic field. State the factors that the magnitude of the force on a current-carrying wire depends on. Determine the direction of the force on a current-carrying wire in a magnetic field. Describe what happens to charged particles in a magnetic field. Explain why a force acts on a wire in a magnetic field when a current flows along the wire. State the equation used to and the force on a moving charge Unit 4 State what the kinetic energy of a rotating object depends on. Calculate the work done by a torque when it makes a rotating object turn. Describe how to measure the moment of inertia of a flywheel. State what angular momentum is and why it is important. State what is meant by the conservation of angular momentum. Explain what angular impulse is. Explain how the equations for angular momentum and linear momentum compare with each other
	30/01/23	Unit 3 Magnetic Fields Unit 4 Renewable energy	Unit 3 Conductors in a magnetic field Moving charges in a magnetic fields Unit 4 Wind power Solar power	Unit 3 Measure the strength of a magnetic field. State the factors that the magnitude of the force on a current-carrying wire depends on. Determine the direction of the force on a current-carrying wire in a magnetic field. Describe what happens to charged particles in a magnetic field. Explain why a force acts on a wire in a magnetic field when a current flows along the wire. State the equation used to and the force on a moving charge Unit 4 Describe the factors that determine the power available from a wind turbine. Calculate the maximum power available from the wind passing through a wind turbine. Explain why not all the kinetic energy from the wind can be used. Explain what is meant by wind shadows. Describe the environmental effects of using wind turbines Describe the factors that affect the power available from the Sun. Calculate the maximum power available from the Sun at different distances from the Sun. Describe the characteristics of a solar cell. Explain how solar cells may be connected together in a solar panel.
	06/02/23	Unit 3 Magnetic Fields Unit 4 Renewable energy	Unit 3 Conductors in a magnetic field Moving charges in a magnetic fields Unit 4 Hydroelectric and pumped storage	Unit 3 Measure the strength of a magnetic field. State the factors that the magnitude of the force on a current-carrying wire depends on. Determine the direction of the force on a current-carrying wire in a magnetic field. Describe what happens to charged particles in a magnetic field. Explain why a force acts on a wire in a magnetic field when a current flows along the wire. State the equation used to and the force on a moving charge Unit 4 Describe the factors that determine the power available from a wind turbine. Calculate the maximum power available from the wind passing through a wind turbine. Explain why not all the kinetic energy from the wind can be used. Explain what is meant by wind shadows. Describe the environmental effects of using wind turbines Describe the factors that affect the power available from the Sun. Calculate the maximum power available from the Sun at different distances from the Sun. Describe the characteristics of a solar cell. Explain how solar cells may be connected together in a solar panel.

13/02/23	School Break Half Term February		
20/02/23	Unit 3 Magnetic Fields Unit 4 Renewable energy	Unit 3 Moving charges in a magnetic field Induction Unit 4 Retrieval practice for renewable energy and rotational dynamics	Unit 3 Describe what happens to the direction of the magnetic force when electrons are deflected by a magnetic field. Explain why the moving charges move in a path that is circular. State the factors that affect the radius of the circular path. Describe what must happen to a conductor (or to the magnetic field in which it is placed) for electricity to be generated. State the factors that would cause the induced e.m.f. to be greater. Discuss whether an induced e.m.f. always causes a current to flow. Unit 4 Retrieval Practice and Feedback Evaluate your learning of the content explored in Unit 1 to idenitfy your areas of development
27/02/23	Unit 3 Magnetic Fields	Unit 3 Charged particles in a magnetic field EMF and Induction Conservation of energy and Magnetic fields	Unit 3 Describe what happens to the direction of the magnetic force when electrons are deflected by a magnetic field. Explain why the moving charges move in a path that is circular. State the factors that affect the radius of the circular path Describe what must happen to a conductor (or to the magnetic field in which it is placed) for electricity to be generated. State the factors that would cause the induced e.m.f. to be greater. Discuss whether an induced e.m.f. always causes a current to flow Define the magnetic flux and the magnetic flux linkage. Relate the induced e.m.f. in a coil to the magnetic flux linkage through it. State Lenz's law and the conservation law that explains it State the two features of the output voltage waveform that change if the coil is turned faster. Explain why the output alternates. Explain why it is preferable for practical generators to have fixed coils and a rotating (electro)magnet
06/03/23	Unit 3 Magnetic Fields	Unit 3 Generating ac electricity Transformers National Grid	Unit 3 Define an alternating current. Explain what is meant by the rms value of an alternating current. Calculate the power suppliedby an alternating current. Explain the purpose of transformers. Describe the energy changes that take place in a transformer. Discuss how the effciency of transformers is improved
13/03/23	Unit 3 Magnetic Fields	Unit 3 Retrieval Practice	Unit 3 Retrieval Practice and Feedback Evaluate your learning of the content explored in Unit 3 to idenitfy your areas of development
20/03/23	Revision of content from all units and pratical catch ups for learners who may have missed out on them over the AS and A2 year	Revision of content from all units and pratical catch ups for learners who may have missed out on them over the AS and A2 year	Consolidating knowledge to ensure correct prep for examination series