

## Curriculum

<b>Grade:</b>	11 IP
<b>Subject:</b>	Physics

Topic	Description	Lesson	Lesson Code	Objectives
Static Electricity	Analysis of the forces exerted by separated positive and negative charges on one another. The student will consider the charges and the distance between them in order to find the net force exerted on a charged object.	Electric Charge	C1.1	<ul style="list-style-type: none"> <li>→Show evidence of charge.</li> <li>→Explain the microscopic view of charge.</li> <li>→Know the difference between conductors and insulators.</li> </ul>
		Electrostatic Force	C1.2	<ul style="list-style-type: none"> <li>→Relate the distance between charges and the electrostatic force.</li> <li>→Know charging by conduction and induction.</li> <li>→Apply Coulomb's law.</li> <li>→Find the net electrostatic force on a charged object.</li> </ul>
Electric Fields	Analysis of charges in electric fields. The student will know how to measure electric fields and know the applications of electric fields.	Measuring Electric Fields	C2.1	<ul style="list-style-type: none"> <li>→Define the Electric Field</li> <li>→Know how charge, electric field, and forces on charged objects are related.</li> <li>→Represent Electric Fields in diagrams.</li> </ul>
		Applications of Electric Fields	C2.2	<ul style="list-style-type: none"> <li>→Define an electric potential difference.</li> <li>→Relate potential difference to the work required to move a charge.</li> <li>→Know the properties of capacitors.</li> </ul>

Magnetic Fields	Understanding magnetism and its applications. The student will know how magnets and moving electric charges are surrounded by magnetic fields that exert forces on magnetic materials and on moving charges.	Understanding Magnetism	C3.1	<ul style="list-style-type: none"> <li>→Know the properties of magnets and what causes an object to be magnetic.</li> <li>→Know the properties of magnetic fields.</li> <li>→Relate magnetic fields and electric currents.</li> </ul>
		Applying Magnetic Forces	C3.2	<ul style="list-style-type: none"> <li>→Relate the direction of the force on a current-carrying wire to the direction of the magnetic field.</li> <li>→Know what affects the force on a current-carrying wire in a magnetic field.</li> <li>→Know the characteristics of the design and operation of an electric motor.</li> <li>→Know what affects the force on a charged particle moving in a magnetic field.</li> </ul>
Electromagnetic Induction	Understanding induced currents and their applications. The student will know that a changing magnetic field can induce current in a conductor.	Inducing Currents	C4.1	<ul style="list-style-type: none"> <li>→Know what induced EMF is.</li> <li>→Know what affects the induced EMF and current produced by a changing magnetic field.</li> <li>→Know how a generator produce electrical energy.</li> <li>→Relate the effective current and effective potential difference to the maximum values of these quantities in an AC circuit.</li> </ul>

		Applications of Induced Currents	C4.2	<ul style="list-style-type: none"> <li>→Know what Lenz's law is and relate it to induced EMFs.</li> <li>→Know what self-inductance is and how it affects circuits.</li> <li>→Know how the turns ratio in a transformer affects potential difference and current.</li> </ul>
Electromagnetism	Understanding electromagnetism. The student will know that electromagnetic waves are coupled oscillating electric and magnetic fields generated by accelerating electrons.	Electric and Magnetic Forces on Particles	C5.1	→Determine velocities of particles in electric and magnetic fields
		Electric and Magnetic Fields in Space	C5.2	<ul style="list-style-type: none"> <li>→Know how electromagnetic waves propagate in space.</li> <li>→Know how the speed at which electromagnetic waves propagate through different materials varies.</li> </ul>
Motion in Two Dimensions	Analysis of the motion of an object in two dimensions. The student will know how to use vectors and Newton's laws to describe projectile motion and circular motion.	Projectile Motion	C6.1	<ul style="list-style-type: none"> <li>→Relate the vertical and horizontal motions of a projectile.</li> <li>→Relate the projectile's height , time in the air, initial velocity and horizontal distance traveled.</li> </ul>
		Circular Motion	C6.2	<ul style="list-style-type: none"> <li>→Know why an object moving in a circle at a constant speed is accelerating.</li> <li>→Relate the centripetal acceleration to the object's speed and the radius of the circle.</li> </ul>

Vibrations and Waves	Analysis of waves and wave behavior. The student will know the properties of a wave and its behavior.	Wave Properties	C7.1	<ul style="list-style-type: none"> <li>→ Know what waves are.</li> <li>→ Compare transverse and longitudinal waves.</li> <li>→ Relate wave speed, wavelength and frequency.</li> </ul>
		Wave Behavior	C7.2	<ul style="list-style-type: none"> <li>→ Know how wave are reflected and refracted at boundaries between mediums.</li> <li>→ Know how the principle of superposition applies to the phenomenon of interference.</li> </ul>
Sound	Analysis of sound waves and their properties. The student will know the properties of sound waves and how sound is detected.	Properties and Detection of Sound	C8.1	<ul style="list-style-type: none"> <li>→ Know what properties sound shares with other waves.</li> <li>→ Relate the physical properties of waves to our perception of sound.</li> <li>→ Know what Doppler effect is.</li> <li>→ Know some applications of Doppler effect.</li> </ul>