

## Curriculum Map Year 11 - PHYSICS

Topic Name	Term	Content / skills developed with link to NC / exam board subject content (if applicable)	Reflection on previous learning	Progress to future learning	Global Citizenship links	Qatar National Identity links
Unit-6 Magnetism and Electromagnetism	1	<ul style="list-style-type: none"> <li>6.1 use the following units: ampere (A), volt (V) and watt (W)</li> <li>6.2 know that magnets repel and attract other magnets and attract magnetic substances</li> <li>6.3 describe the properties of magnetically hard and soft materials</li> <li>6.4 understand the term 'magnetic field line'</li> <li>6.5 know that magnetism is induced in some materials when they are placed in a magnetic field</li> <li>6.7 describe how to use two permanent magnets to produce a uniform magnetic field Pattern</li> <li>6.8 know that an electric current in a conductor produces a magnetic field around it</li> <li>6.9P describe the construction of electromagnets</li> </ul>	Year 9 Electromagnetic Fields and Magnetic force	6.6 investigate the magnetic field pattern for a permanent bar magnet and between two bar magnets  Grade 13- Unit-4 Electromagnetism	PRIDE Prepare for future challenges Developing skills for the future	<p>Conscious thinking about my Actions</p> <p>Conscious thinking about my Future</p> <p>Conscious thinking about my Family</p> <p>Conscious thinking about my Health</p>
		<ul style="list-style-type: none"> <li>6.10P draw magnetic field patterns for a straight wire, a flat circular coil and a solenoid when each is carrying a current</li> <li>6.11P know that there is a force on a charged particle when it moves in a magnetic field as</li> </ul>	Year 9, Magnets and Magnetic fields, Magnetic effect of current Electromagnetic Force, Relays	Investigate the Magnetic field of a current carrying wire. Investigate the working of Electromagnet and Electric Motors.	PRIDE Prepare for future challenges Developing skills for the future	<p>Conscious thinking about my Environment</p> <p>Conscious thinking</p>

		<p>long as its motion is not parallel to the field.</p> <ul style="list-style-type: none"> <li>• <b>6.12</b> 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.</li> <li>• <b>6.13</b> use the left-hand rule to predict the direction of the resulting force when a wire carries a current perpendicular to a magnetic field</li> <li>• <b>6.14</b> describe how the force on a current-carrying conductor in a magnetic field changes with the magnitude and direction of the field and current.</li> <li>• <b>6.15</b> 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</li> <li>• <b>6.16</b> 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</li> <li>• <b>6.17P</b> describe the structure of a transformer and understand that</li> </ul>		<p><b>Investigate working of Transformer.</b></p> <p><b>Grade 13-Unit4 Electromagnets, DC motors, Transformers</b></p>		<p><b>about my Health</b></p>
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		<p>a transformer changes the size of an alternating voltage by having different numbers of turns on the input and output sides.</p> <ul style="list-style-type: none"> <li>• <b>6.18P</b> explain the use of step-up and step-down transformers in the large-scale generation and transmission of electrical energy.</li> <li>• <b>6.19P</b> know and use the relationship between input (primary) and output (secondary) voltages and the turns ratio for a transformer: <math display="block">\frac{\text{input (primary) voltage}}{\text{output (secondary) voltage}} = \frac{\text{primary turns}}{\text{secondary turns}}</math> <ul style="list-style-type: none"> <li>• <b>6.20P</b> know and use the relationship:  <b>input power = output power</b>  <math>V_p I_p = V_s I_s</math>  <b>for 100% efficiency</b></li> </ul> </li></ul>				
<b>UNIT- 7 Radioactivity and particles</b>	<b>1</b>	<ul style="list-style-type: none"> <li>• <b>7.1</b> use the following units: becquerel (Bq), centimetre (cm), hour (h), minute (min) and second (s).</li> <li>• <b>7.2</b> describe the structure of an atom in terms of protons, neutrons and electrons and use</li> </ul>	<b>Grade7, Atomic structure Grade 8 Energy Transfer-Nuclear Energy</b>	<b>7.6 practical: investigate the penetration powers of different types of radiation using either radioactive sources or simulations</b>	<b>PRIDE Prepare for future challenges Developing skills for the future</b>	<b>Conscious thinking about my Actions  Conscious thinking</b>

		<p>symbols such as <math>^{14}_6\text{C}</math> to describe particular nuclei.</p> <ul style="list-style-type: none"> <li>• <b>7.3</b> know the terms atomic (proton) number, mass (nucleon) number and isotope.</li> <li>• <b>7.4</b> know that alpha (<math>\alpha</math>) particles, beta (<math>\beta^-</math>) particles, and gamma (<math>\gamma</math>) rays are ionising radiations emitted from unstable nuclei in a random process.</li> <li>• <b>7.5</b> describe the nature of alpha (<math>\alpha</math>) particles, beta (<math>\beta^-</math>) particles and gamma (<math>\gamma</math>) rays, and recall that they may be distinguished in terms of penetrating power and ability to ionise.</li> <li>• <b>7.7</b> describe the effects on the atomic and mass numbers of a nucleus of the emission of each of the four main types of radiation (alpha, beta, gamma and neutron radiation)</li> <li>• <b>7.8</b> understand how to balance nuclear equations in terms of mass and charge</li> <li>• <b>7.9</b> know that photographic film or a Geiger–Müller detector can detect ionising radiations.</li> <li>• <b>7.10</b> explain the sources of background (ionising) radiation from Earth and space.</li> <li>• <b>7.11</b> know that the activity of a radioactive source decreases over a period of time and is measured in becquerels.</li> </ul>		<p><b>Grade 13- Unit5 Radioactivity</b></p>		<p>about my <b>Future</b></p> <p><b>Conscious thinking</b> about my <b>Country</b></p> <p><b>Conscious thinking</b> about my <b>Environment</b></p> <p><b>Conscious thinking</b> about my <b>Health</b></p>
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		<ul style="list-style-type: none"><li>• <b>7.12</b> know the definition of the term 'half-life' and understand that it is different for different radioactive isotopes.</li><li>• <b>7.13</b> use the concept of the half-life to carry out simple calculations on activity, including graphical methods.</li><li>• <b>7.14</b> describe uses of radioactivity in industry and medicine.</li><li>• <b>7.15</b> describe the difference between contamination and irradiation.</li><li>• <b>7.16</b> describe the dangers of ionising radiations, including: that radiation can cause mutations in living organisms that radiation can damage cells and tissue the problems arising from the disposal of radioactive waste and how the associated risks can be reduced.</li><li>• <b>7.17</b> know that nuclear reactions, including fission, fusion and radioactive decay, can be a source of energy.</li><li>• <b>7.18</b> understand how a nucleus of U-235 can be split (the process of fission) by collision with a neutron and that this process releases energy as kinetic energy of the fission products.</li></ul>				
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		<ul style="list-style-type: none"> <li>• <b>7.19</b> know that the fission of U-235 produces two radioactive daughter nuclei and a small number of neutrons.</li> <li>• <b>7.20</b> describe how a chain reaction can be set up if the neutrons produced by one fission strike other U-235 nuclei.</li> <li>• <b>7.21</b> describe the role played by the control rods and moderator in the fission process.</li> <li>• <b>7.22</b> understand the role of shielding around a nuclear reactor.</li> <li>• <b>7.23</b> explain the difference between nuclear fusion and nuclear fission.</li> <li>• <b>7.24</b> describe nuclear fusion as the creation of larger nuclei resulting in a loss of mass from smaller nuclei, accompanied by a release of energy.</li> <li>• <b>7.25</b> know that fusion is the energy source for stars.</li> <li>• <b>7.26</b> explain why nuclear fusion does not happen at low temperatures and pressures, due to electrostatic repulsion of protons</li> </ul>				
<b>UNIT- 8 Astrophysics</b>	<b>1</b>	<ul style="list-style-type: none"> <li>• <b>8.1 use the following units: kilogram (kg), metre (m), metre/second (m/s), metre/second<sup>2</sup> (m/s<sup>2</sup>), newton (N), second (s), newton/kilogram (N/kg).</b></li> </ul>	<b>Grade 8 Earth and space</b>	<b>Grade 13 Astrophysics</b>	<b>PRIDE Prepare for future challenges</b>	<b>Conscious thinking about my Actions</b>

		<ul style="list-style-type: none"> <li>• 8.2 know that: the universe is a large collection of billions of galaxies, a galaxy is a large collection of billions of stars</li> <li>• our solar system is in the Milky Way galaxy.</li> <li>• 8.3 understand why gravitational field strength, <math>g</math>, varies and know that it is different on other planets and the Moon from that on the Earth</li> </ul>			<b>Developing skills for the future</b>	<b>Conscious thinking about my Future</b>  <b>Conscious thinking about my Country</b>  <b>Conscious thinking about my Environment</b>  <b>Conscious thinking about my Health</b>
<b>Revision &amp; Developing Examination Technique</b>	<b>2</b>	<ul style="list-style-type: none"> <li>• <b>Revision &amp; Developing Examination Technique</b></li> </ul>				