

K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT

Grade: 12
Subject Title: General Physics 2

Quarters: General Physics 2 (Q3 & Q4)
No. of Hours/Quarter: 40 hrs /quarter
Prerequisite: General Physics 1

Course Description: Electricity and magnetism; optics; the basics of special relativity, atomic and nuclear phenomena using the methods and concepts of algebra, geometry, trigonometry, graphical analysis, and basic calculus

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT
Electric Charge, Coulomb’s Law, Electric Fields, and Electric Flux	<i>The learners demonstrate an understanding of:</i> 1. Electric charge 2. Insulators and conductors 3. Induced charges 4. Coulomb’s Law 5. Electric forces and fields 6. Electric field calculations 7. Charges on conductors	<i>The learners are able to:</i> Use theoretical and experimental approaches to solve multiconcept and rich-context problems involving electricity and magnetism	<i>The learners:</i> 1. Describe using a diagram charging by rubbing and charging by induction	STEM_GP12EM-IIIa-1	
			2. Explain the role of electron transfer in electrostatic charging by rubbing	STEM_GP12EM-IIIa-2	
			3. Describe experiments to show electrostatic charging by induction	STEM_GP12EM-IIIa-3	
			4. State that there are positive and negative charges, and that charge is measured in coulombs	STEM_GP12EM-IIIa-4	
			5. Predict charge distributions, and the resulting attraction or repulsion, in a system of charged insulators and conductors	STEM_GP12EM-IIIa-5	
			6. Calculate the net electric force on a point charge exerted by a system of point charges	STEM_GP12EM-IIIa-6	
			7. Describe an electric field as a region in which an electric charge experiences a force	STEM_GP12EM-IIIa-7	
			8. Draw electric field patterns due to systems with isolated point charges	STEM_GP12EM-IIIa-8	
			9. Use in calculations the relationship between the electric field and the electric force on a test charge	STEM_GP12EM-IIIa-9	
			10. Calculate the electric field due to a system of point charges using Coulomb’s law and the superposition principle	STEM_GP12EM-IIIa-10	

K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT
	8. Electric flux and Gauss's Law 9. Electric charge, dipoles, force, field, and flux problems		11. Predict the trajectory of a point charge in a uniform electric field	STEM_GP12EM-IIIa-11	
			12. Calculate electric flux	STEM_GP12EM-IIIb-12	
			13. Use Gauss's law to infer electric field due to uniformly distributed charges on long wires, spheres, and large plates	STEM_GP12EM-IIIb-13	
			14. Solve problems involving electric charges, dipoles, forces, fields, and flux in contexts such as, but not limited to, systems of point charges, classical models of the atom, electrical breakdown of air, charged pendulums, control of electron and proton beams, electrostatic ink-jet printers	STEM_GP12EM-IIIb-14	
Electric Potential	1. Electric potential energy 2. Electric potential 3. Equipotential surfaces 4. Electric field as a potential gradient 5. Electric potential		1. Relate the electric potential with work, potential energy, and electric field	STEM_GP12EM-IIIb-15	
			2. Evaluate the potential at any point in a region containing point charges	STEM_GP12EM-IIIc-16	
			3. Determine the electric potential function at any point due to highly symmetric continuous- charge distributions	STEM_GP12EM-IIIc-17	
			4. infer the direction and strength of electric field vector, nature of the electric field sources, and electrostatic potential surfaces given the equipotential lines	STEM_GP12EM-IIIc-18	
			5. Infer the distribution of charges at the surface of an arbitrarily shaped conductor	STEM_GP12EM-IIIc-19	
			6. Calculate the electric field in the region given a mathematical function describing its potential in a region of space	STEM_GP12EM-IIIc-20	
			7. Perform an experiment involving electric fields and equipotential lines and analyze the data – identifying and analyzing discrepancies between experimental results and theoretical expectations when appropriate	STEM_GP12EM-IIIc-21	

**K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT
			8. Solve problems involving electric potential energy and electric potentials in contexts such as, but not limited to, electron guns in CRT TV picture tubes, conditions for merging of charge liquid drops, and Van de Graaff generators	STEM_GP12EM-IIIc-22	
Capacitance and Dielectrics	1. Capacitance and capacitors a. Capacitors in series and parallel b. Energy stored and electric-field energy in capacitors 2. Dielectrics		1. Deduce the effects of simple capacitors (e.g., parallel-plate, spherical, cylindrical) on the capacitance, charge, and potential difference when the size, potential difference, or charge is changed	STEM_GP12EM-IIIId-23	
			2. Calculate the equivalent capacitance of a network of capacitors connected in series/parallel	STEM_GP12EM-IIIId-24	
			3. Determine the total charge, the charge on, and the potential difference across each capacitor in the network given the capacitors connected in series/parallel	STEM_GP12EM-IIIId-25	
			4. Determine the potential energy stored inside the capacitor given the geometry and the potential difference across the capacitor	STEM_GP12EM-IIIId-26	Basic Electronics Kit
			5. Predict the effects on the final potential difference and change in potential energy of a capacitor when either the geometry or charge is changed	STEM_GP12EM-IIIId-27	
			6. Determine the energy density and the electric field inside a capacitor with a given configuration	STEM_GP12EM-IIIId-28	
			7. Describe the effects of inserting dielectric materials on the capacitance, charge, and electric field of a capacitor	STEM_GP12EM-IIIId-29	
			8. Solve problems involving capacitors and dielectrics in contexts such as, but not limited to, charged plates, electroscopes, batteries, camera flashlamps, Geiger counters, and coaxial cables	STEM_GP12EM-IIIId-30	

K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT
Current, Resistance, and Electromotive force	<ol style="list-style-type: none"> 1. Current, resistivity, and resistance 2. Ohm’s law 3. Energy and power in electric circuits 4. Electrical safety 		1. Distinguish between conventional current and electron flow	STEM_GP12EM-IIIId-32	
			2. Apply the relationship charge = current x time to new situations or to solve related problems	STEM_GP12EM-IIIe-33	
			3. Relate the drift velocity of a collection of charged particles to the electrical current and current density	STEM_GP12EM-IIIe-34	
			4. Describe the effect of temperature increase on the resistance of a metallic conductor	STEM_GP12EM-IIIe-35	
			5. Describe the ability of a material to conduct current in terms of resistivity and conductivity	STEM_GP12EM-IIIe-36	
			6. Apply the relationship of the proportionality between resistance and the length and cross-sectional area of a wire to solve problems	STEM_GP12EM-IIIe-37	
			7. Differentiate ohmic and non-ohmic materials in terms of their I-V curves	STEM_GP12EM-IIIe-38	<ol style="list-style-type: none"> 1. Basic Electronics Kit 2. DC Ammeter 3. DC Voltmeter 4. Dry Cell Holder Size D (1set= 4 pcs) 5. Dry Cell Size D, 1.5 volts 6. Dry Cell, 9 volts 7. Miniature Light Bulb Base (1set = 3 pcs) 8. Multimeter/MultiTester 9. Set of Coils 10. Set of Connectors (1 set = 3- red, 3- black, 2- white, 2- blue 11. Switches, Knife Type
			8. Define electromotive force (emf) as the work done by a source in driving a unit charge around a complete circuit	STEM_GP12EM-IIIe-39	

**K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT
			9. Differentiate emf of a source and potential difference (PD) across a circuit	STEM_GP12EM-IIIe-40	
			10. Use the the relationship $R = V/I$ to solve problems	STEM_GP12EM-IIIe-41	
			11. Given an emf source connected to a resistor, determine the power supplied or dissipated by each element in a circuit	STEM_GP12EM-IIIe-42	
			12. Describe the physiological effects of electrical shock; electrical hazards; safety devices and procedures	STEM_GP12EM-IIIe-43	Fuse Holder w/ Fuse
			13. Solve problems involving current, resistivity, resistance, and Ohm's law in contexts such as, but not limited to, batteries and bulbs, household wiring, selection of fuses, and accumulation of surface charge in the junction between wires made of different materials	STEM_GP12EM-IIIe-44	
	1. Devices for measuring currents and voltages 2. Experiments on Ohmic and non-Ohmic materials		1. Operate devices for measuring currents and voltages	STEM_GP12EM-IIIe-45	1. DC Ammeter 2. DC Voltmeter 3. Dry Cell Size D, 1.5 volts 4. Dry Cell, 9 volts 5. Multimeter/MultiTester
			2. Plan and perform an experiment involving ohmic and non-ohmic materials and analyze the data – identifying and analyzing discrepancies between experimental results and theoretical expectations when appropriate	STEM_GP12EM-IIIIf-46	1. Basic Electronics Kit 2. DC Ammeter 3. DC Voltmeter 4. Dry Cell Holder Size D (1set= 4 pcs) 5. Dry Cell Size D, 1.5 volts 6. Dry Cell, 9 volts 7. Galvanometer 8. Miniature Light Bulb (1 set = 3 pcs) 9. Miniature Light Bulb Base (1 set = 3 pcs) 10. Motor-Generator

K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT
					Model 11. Multimeter/MultiTester 12. Set of Connectors (1 set = 3- red, 3- black, 2- white, 2- blue 13. Switches, Knife Type
Direct-Current Circuits	<ol style="list-style-type: none"> Resistors in series and parallel Kirchoff's rules R-C circuits 		<ol style="list-style-type: none"> Draw circuit diagrams with power sources (cell or battery), switches, lamps, resistors (fixed and variable) fuses, ammeters and voltmeters 	STEM_GP12EM-IIIIf-47	Basic Radioactivity Kit
			<ol style="list-style-type: none"> Evaluate the equivalent resistance, current, and voltage in a given network of resistors connected in series and/or parallel 	STEM_GP12EM-IIIg-48	
			<ol style="list-style-type: none"> Calculate the current and voltage through and across circuit elements using Kirchhoff's loop and junction rules (at most 2 loops only) 	STEM_GP12EM-IIIg-49	
			<ol style="list-style-type: none"> Describe the initial, transient, and steady state behavior of current, potential, and charge in a capacitor that is either charging or discharging 	STEM_GP12EM-IIIg-50	
			<ol style="list-style-type: none"> Solve problems involving the calculation of currents and potential differences in circuits consisting of batteries, resistors, and capacitors 	STEM_GP12EM-IIIg-51	
	<ol style="list-style-type: none"> Experiments with batteries-and-resistors circuits 		<ol style="list-style-type: none"> Plan and perform experiment involving batteries and resistors in one or more electric circuits and analyze the data 	STEM_GP12EM-IIIg-52	<ol style="list-style-type: none"> DC Ammeter DC Voltmeter Dry Cell Holder Size D (1set= 4 pcs) Dry Cell Size D, 1.5 volts Dry Cell, 9 volts Galvanometer Miniature Light Bulb (1 set = 3 pcs) Miniature Light Bulb

**K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT
					Base (1set = 3 pcs) 9. Motor-Generator Model 10. Multimeter/MultiTester 11. Set of Connectors (1 set = 3- red, 3- black, 2- white, 2- blue 12. Switches, Knife Type
Force due to Magnetic Fields and Sources of Magnetic Fields	1. Magnetic fields 2. Lorentz Force 3. Motion of charge particles in electric and magnetic fields 4. Magnetic forces on current carrying wires		1. Describe the interaction between poles of magnets	STEM_GP12EM-IIIh-53	Advanced Electromagnetism Kit
			2. Differentiate electric interactions from magnetic interactions	STEM_GP12EM-IIIh-54	
			3. Evaluate the total magnetic flux through an open surface	STEM_GP12EM-IIIh-55	
			4. Explain why the magnetic flux on a closed surface is zero	STEM_GP12EM-IIIh-56	
			5. Draw the magnetic field pattern around (1) a bar magnet, and (2) between the poles of two bar magnets	STEM_GP12EM-IIIh-57	Advanced Electromagnetism Kit
			6. Describe the motion of a charged particle in a magnetic field in terms of its speed, acceleration, cyclotron radius, cyclotron frequency, and kinetic energy	STEM_GP12EM-IIIh-58	
			7. Evaluate the magnetic force on an arbitrary wire segment placed in a uniform magnetic field	STEM_GP12EM-IIIh-59	
	1. Biot-Savart Law 2. Ampere's Law		1. Evaluate the magnetic field vector at a given point in space due to a moving point charge, an infinitesimal current element, or a straight current-carrying conductor	STEM_GP12EM-IIIh-60	
			2. Calculate the magnetic field due to one or more straight wire conductors using the superposition principle	STEM_GP12EM-IIIi-62	
			3. Calculate the force per unit length on a current carrying wire due to the magnetic field produced by other current-carrying	STEM_GP12EM-IIIi-63	

K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT
			wires		
			4. Evaluate the magnetic field vector at any point along the axis of a circular current loop	STEM_GP12EM-IIIi-64	
			5. Calculate magnetic fields for highly symmetric current configurations using Ampere’s law	STEM_GP12EM-IIIi-65	
			6. Solve problems involving magnetic fields, forces due to magnetic fields and the motion of charges and current-carrying wires in contexts such as, but not limited to, determining the strength of Earth’s magnetic field, cyclotrons, mass spectrometers, and solenoids	STEM_GP12EM-IIIi-66	
Integration of Electrostatic, Magnetostatics, and Electric Circuits Concepts	Refer to Week 1 to Week 9		1. Solve multiconcept, rich-context problems in electricity and magnetism using theoretical and experimental approaches 2. Assessment of the performance standard	STEM_GP12EM-IIIj-67 (1 week including assessment of the performance standard)	
Magnetic Induction, Inductance, AC, and LC Circuits	1. Magnetic induction 2. Faraday’s Law 3. Alternating current, LC circuits, and other applications of magnetic induction	1. Use theoretical and, when feasible, experimental approaches to solve multiconcept, rich-context problems using concepts from electromagnetic waves, optics, relativity, and atomic and nuclear theory 2. Apply ideas from atomic and nuclear	1. Identify the factors that affect the magnitude of the induced emf and the magnitude and direction of the induced current (Faraday’s Law)	STEM_GP12EM-IVa-1	Advanced Electromagnetism Kit
			2. Relate Faraday’s experiments and Maxwell’s evaluation to a given experiment	STEM_GP12EM-IVa-2	
			3. Compare and contrast electrostatic electric field and nonelectrostatic/induced electric field	STEM_GP12EM-IVa-3	
			4. Calculate the induced emf in a closed loop due to a time-varying magnetic flux using Faraday’s Law	STEM_GP12EM-IVa-4	

**K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT	
		physics in contexts such as, but not limited to, radiation shielding and inferring the composition of stars	5. Describe the direction of the induced electric field, magnetic field, and current on a conducting/nonconducting loop using Lenz's Law	STEM_GP12EM-IVa-5		
			6. Compare and contrast alternating current (AC) and direct current (DC)	STEM_GP12EM-IVb-6	1. Set of Coils 2. Variable Power Supply, AC-DC	
			7. Use analogies with the spring-mass system to draw conclusions about the properties of LC circuits	STEM_GP12EM-IVb-7		
			8. Characterize the properties (stored energy and time-dependence of charges, currents, and voltages) of an LC circuit	STEM_GP12EM-IVb-8		
			9. Perform demonstrations involving magnetic induction in contexts such as, but not limited to, power generation, transformers, radio tuning, magnet falling in a copper pipe, and jumping rings	STEM_GP12EM-IVb-9	1. Set of Coils 2. Variable Power Supply, AC-DC	
Light as an Electromagnetic Wave	1. Maxwell's synthesis of electricity, magnetism, and optics 2. EM waves and light 3. Law of Reflection 4. Law of Refraction (Snell's Law) 5. Dispersion 6. Polarization (Malus's Law) 7. Applications of reflection, refraction, dispersion, and			1. Narrate Maxwell's line of reasoning in linking EM to light	STEM_GP12OPT-IVb-10	
				2. Narrate the story behind Hertz's experiments	STEM_GP12OPT-IVb-11	
				3. Relate the properties of EM wave (wavelength, frequency, speed) and the properties of vacuum and optical medium (permittivity, permeability, and index of refraction)	STEM_GP12OPT-IVb-12	
				4. Apply the Law of Reflection	STEM_GP12OPT-IVb-13	
			5. Explain the conditions for total internal reflection	STEM_GP12OPT-IVb-14		
			6. Apply Snell's Law	STEM_GP12OPT-IVb-15		
			7. Explain the phenomenon of dispersion by relating to Snell's Law	STEM_GP12OPT-IVb-16		

**K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT
	polarization		8. Cite evidence that EM wave is a transverse wave (polarization)	STEM_GP12OPT-IVc-17	
			9. Calculate the intensity of the transmitted light after passing through a series of polarizers applying Malus’s Law	STEM_GP12OPT-IVc-18	
			10. Plan and perform an experiment involving ray optics and analyze the data – identifying and analyzing discrepancies between experimental results and theoretical expectations when appropriate	STEM_GP12OPT-IVc-19	
			11. Plan and perform an experiment involving optical polarization and analyze the data – identifying and analyzing discrepancies between experimental results and theoretical expectations when appropriate (also perform using mechanical waves)	STEM_GP12OPT-IVc-20	
			12. Solve problems involving reflection, refraction, dispersion, and polarization in contexts such as, but not limited to, (polarizing) sunglasses, atmospheric haloes, and rainbows	STEM_GP12OPT-IVc-21	
Geometric optics	1. Reflection and refraction at plane and spherical surfaces 2. Mirrors 3. Thin lens		1. Explain image formation as an application of reflection, refraction, and paraxial approximation	STEM_GP12OPT-IVd-22	1. Basic Lens Set 2. Mirror Set 3. Optical Bench Set
			2. Relate properties of mirrors and lenses (radii of curvature, focal length, index of refraction [for lenses]) to image and object distance and sizes	STEM_GP12OPT-IVd-23	1. Basic Lens Set 2. Mirror Set 3. Optical Bench Set
			3. Determine graphically and mathematically the type (virtual/real), magnification, location, and orientation of image of a point and extended object produced by a plane or spherical mirror	STEM_GP12OPT-IVd-24	1. Basic Lens Set 2. Mirror Set 3. Optical Bench Set

K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT
			4. Determine graphically and mathematically the type (virtual/real), magnification, location/ apparent depth, and orientation of image of a point and extended object produced by a flat and spherical surface or interface separating two optical media	STEM_GP12OPT-IVd-25	
			5. Differentiate a converging lens from a diverging lens	STEM_GP12OPT-IVd-26	
			6. Determine graphically and mathematically the type (virtual/real), magnification, location, and orientation of image of a point and extended object produced by a lens or series of lenses	STEM_GP12OPT-IVd-27	1. Basic Lens Set 2. Mirror Set 3. Optical Bench Set
			7. Apply the principles of geometric optics to discuss image formation by the eye, and correction of common vision defects	STEM_GP12OPT-IVd-28	Florence Flask
			8. Solve problems in geometric optics in contexts such as, but not limited to, depth perception, microscopes, telescopes, and the correction of vision defects	STEM_GP12OPT-IVe-29	
			1. Narrate the story behind Young’s Two-slit experiments (wave versus particle)	STEM_GP12OPT-IVf-31	
			2. Determine the conditions (superposition, path and phase difference, polarization, amplitude) for interference to occur emphasizing the properties of a laser (as a monochromatic and coherent light source)	STEM_GP12OPT-IVf-32	
			3. Relate the geometry of the two-slit experiment set up (slit separation, and screen-to-slit distance) and properties of light (wavelength) to the properties of the interference pattern (width, location, and intensity)	STEM_GP12OPT-IVf-33	
Interference and diffraction	4. Geometric optics 5. Image formation experiments		4. Predict the occurrence of constructive and destructive reflection from thin films based on their thickness, index of refraction, and wavelength of illumination	STEM_GP12OPT-IVf-34	
			1. Huygens’ Principle 2. Two-source interference of light 3. Intensity in interference patterns 4. Interference in thin films 5. Diffraction from single-slits	1. Narrate the story behind Young’s Two-slit experiments (wave versus particle) 2. Determine the conditions (superposition, path and phase difference, polarization, amplitude) for interference to occur emphasizing the properties of a laser (as a monochromatic and coherent light source) 3. Relate the geometry of the two-slit experiment set up (slit separation, and screen-to-slit distance) and properties of light (wavelength) to the properties of the interference pattern (width, location, and intensity) 4. Predict the occurrence of constructive and destructive reflection from thin films based on their thickness, index of refraction, and wavelength of illumination	STEM_GP12OPT-IVf-31 STEM_GP12OPT-IVf-32 STEM_GP12OPT-IVf-33 STEM_GP12OPT-IVf-34

**K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT
			5. Relate the geometry of the diffraction experiment setup (slit size, and screen-to-slit distance) and properties of light (wavelength) to the properties of the diffraction pattern (width, location, and intensity of the fringes)	STEM_GP12OPT-IVf-35	
			6. Solve problems involving interference and diffraction using concepts such as optical path length, phase difference, and path difference	STEM_GP12OPT-IVf-g-36	
Relativity	1. Postulates of Special Relativity 2. Relativity of times and lengths 3. Relativistic velocity addition		1. State the postulates of Special Relativity and their consequences	STEM_GP12MP-IVg-39	
			2. Apply the time dilation and length contraction formulae	STEM_GP12MP-IVg-40	
			3. Apply the relativistic velocity addition formula	STEM_GP12MP-IVg-41	
	4. Relativistic dynamics 5. Relativistic Doppler effect		4. Calculate kinetic energy, rest energy, momentum, and speed of objects moving with speeds comparable to the speed of light	STEM_GP12MP-IVg-42	
			5. Apply the relativistic Doppler formula	STEM_GP12MP-IVh-43	Variable Power Supply, AC-DC
			6. Solve simple problems in special relativity involving time dilation, length contraction, principle of invariance, mass-energy relation, relativistic velocity addition, and relativistic momentum	STEM_GP12MP-IVh-44	
Atomic and Nuclear Phenomena	1. Photoelectric effect 2. Atomic spectra		7. Explain the photoelectric effect using the idea of light quanta or photons	STEM_GP12MP-IVh-45	Variable Power Supply, AC-DC
			8. Explain qualitatively the properties of atomic emission and absorption spectra using the concept of energy levels	STEM_GP12MP-IVh-46	
	3. Radioactive decay 4. Experiments on atomic and nuclear phenomena		9. Calculating radioisotope activity using the concept of half-life	STEM_GP12MP-IVh-i-47	

K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	TAGGED SCIENCE EQUIPMENT
	5. Applications of atomic and nuclear concepts				
Integration of Magnetic induction, Electromagnetic waves, Optics, and Modern Physics concepts	(Week 1 to Week 9 Concepts)		Assessment of the Performance Standard	(1 week)	

**K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT**

Code Book Legend

Sample: STEM_GP12EM-IIIa-1

LEGEND		SAMPLE	
First Entry	Learning Area and Strand/ Subject or Specialization	Science, Technology, Engineering and Mathematics General Physics	STEM_GP12EM
	Grade Level	Grade 12	
Uppercase Letter/s	Domain/Content/ Component/ Topic	Electricity and Magnetism	
		-	
Roman Numeral <i>*Zero if no specific quarter</i>	Quarter	Third Quarter	III
Lowercase Letter/s <i>*Put a hyphen (-) in between letters to indicate more than a specific week</i>	Week	Week 1	a
		-	
Arabic Number	Competency	Describe using a diagram charging by rubbing and charging by induction	1

DOMAIN/ COMPONENT	CODE
Electricity and Magnetism	EM
Optics	OPT
Modern Physics Concepts	MP

K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL – SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) SPECIALIZED SUBJECT

References:

Cummings, Karen; Laws, Priscilla; Redish, Edward; and Cooney, Patrick. *Understanding Physics*. New Jersey: John Wiley and Sons, 2004. (Reprinted in the Philippines, MG Reprographics for Global Learning Media)

Hewitt, Paul G. *Conceptual Physics, 11th Edition*. San Francisco: Pearson, 2010.

Resnick, Robert; Halliday, David; and Krane, Kenneth. *Physics Vol.2, 5th Edition*. New Jersey: John Wiley and Sons, 2002. (Reprinted in the Philippines by C & E Publishing)

Resnick, Robert; Halliday, David; and Krane, Kenneth. *Physics Vol.1, 5th Edition*. New Jersey: John Wiley and Sons, 2002. (Reprinted in the Philippines by C & E Publishing)

Serway, Raymond, and Belchner, Robert. *Physics for Scientists and Engineers with Modern Physics, 5th Edition*. Orlando: Harcourt College Publishing, 2000.

Tipler, Paul. *Physics for Scientists and Engineers, 4th Edition*. New York: W.H. Freeman and Company, 1999.

Tsokos, K.A. *Physics for the IB Diploma, 5th Edition*. Cambridge: Cambridge University Press, 2010.

Young, Hugh D., and Freedman, Roger A. *Sears and Zemansky's University with Modern Physics, 11th Edition*. San Francisco: Pearson, 2004.