Physics
GRADE 12

SLOs for Assessment Key:
1.Assessible / Attainable - (Not included in drop down list)
2. Ambiguous (assessable in longer run) - (BOLD White)
3. Not assessable in Summitive - (Grey)
4. Repetitive (with in same grade) - (Grey)

Domains	Standards	Benchmarks	Topic/Title	NC SLO #	NCP (2022) - SLO	Status of SLOs	SLOs for Assessment	Cognitive Domain	Final Cognitive Domain
Mechanics	1. Use Newton's law to analyze motion 2. analyze gravitational potential energy	**BenchmarkII:** Explain events in terms of Newton's Law of Gravitation	**Gravitation**	[SLO: P-12-B-01]	Define and calculate gravitational field strength	Modified(rephrased) SLO		Apply	
				[SLO: P-12-B-02]	Analyse gravitational fields by means of field lines.	New SLO		Analyse	
				[SLO: P-12-B-03]	Apply Newton's law of gravitation to solve problems	New SLO		Apply	
				[SLO: P-12-B-04]	Analyze circular orbits in gravitational fields	New SLO		Analyse	
				[SLO: P-12-B-05]	Analyze the motion of geostationary satellites	Modified(rephrased) SLO		Analyse	
				[SLO: P-12-B-06]	Derive the equation for gravitational field strength	New SLO		Apply	
				[SLO: P-12-B-07]	Analyse why is approximately constant for small changes in height near the Earth's surface	New SLO		Analyse	
				[SLO: P-12-B-08]	Define and calculate gravitational potential	Modified (Split) SLO		Apply	
				[SLO: P-12-B-09]	Justify how the concept of gravitational potential leads to the gravitational potential energy of two point masses	Modified (Split) SLO		Evaluate	
Heat and Thermodynamics	1. the effects of heat on the physical properties of matter by making reference to the kinetic theory of matter 2. how heat can be transferred through different modes	**Benchmark I:** Use the kinetic theory of matter to account for the properties of an ideal gas	**Thermodynamics**	[SLO: P-12-C-01]	explain how molecular movement causes the pressure exerted by a gas	Modified(rephrased) SLO		Understand	
				[SLO: P-12-C-02]	Derive and use the relationship pV=1/3 Nm<c^2>	New SLO		Apply	
				[SLO: P-12-C-03]	Calculate the the root-mean-square speed of an ideal gas	New SLO		Apply	
				[SLO: P-12-C-04]	Derive and use the formula for the average translational kinetic energy of a gas	New SLO		Apply	
				[SLO: P-12-C-05]	Illustrate that the model of ideal gasses is used a base from which the field of statistical mechanics emerged	New SLO	**Ambiguous**	Understand	Understand
				[SLO: P-12-C-06]	State that under extreme physical conditions, atoms can break down into sub-atomic particles that can form unusual states of matter	New SLO		Remember	
				[SLO: P-12-D-01]	describe simple examples of free oscillations.	Matched SLO		Understand	
				[SLO: P-12-D-02]	use the terms displacement, amplitude, period, frequency, angular frequency and phase difference in the context of oscillations	Modified (Split) SLO		Apply	
				[SLO: P-12-D-03]	Express the period of simple harmonic motion in terms of both frequency and angular frequency	Modified (Split) SLO		Understand	

Waves	1. mathematically describe how waves propagate and the general properties of reflection, refraction and diffraction 2. explain how the wave theory of light can help explain various optical phenomena	**Benchmark I:** Analytically and graphically explain the nature and effects of simple harmonic motion. **Benchmark II:** Use wave theory to analyse diffraction patterns, interference in the context of light waves	**Simple Harmonic Motion**	[SLO: P-12-D-04]	Explain that simple harmonic motion occurs when acceleration is proportional to displacement from a fixed point and in the opposite direction	Modified (Split) SLO		Understand	
				[SLO: P-12-D-05]	use $a=-\omega^2 x$ to solve problems	Modified (Split) SLO		Apply	
				[SLO: P-12-D-06]	use the equations $v=v0\cos(\omega t)$ and $v=\pm\omega\sqrt{(x0^2-x^2)}$ to solve problems	New SLO	**Ambiguous**	Apply	
				[SLO: P-12-D-07]	Analyze graphical representations of the variations of displacement, velocity and acceleration for simple harmonic motion	New SLO		Analyse	Practical Assessment
				[SLO: P-12-D-08]	Analyse the interchange between kinetic and potential energy during simple harmonic motion	Matched SLO		Analyse	Understand
				[SLO: P-12-D-09]	Apply $1/2\ m\omega^2 x0^2$for the total energy of a system undergoing simple harmonic motion	New SLO		Apply	
				[SLO: P-12-D-10]	describe that a resistive force acting on an oscillating system causes damping	New SLO		Understand	
				[SLO: P-12-D-11]	use the terms light, critical and heavy damping	New SLO		Apply	
				[SLO: P-12-D-12]	sketch displacement–time graphs to illustrate light, critical and heavy damping	New SLO		Apply	
				[SLO: P-12-D-13]	State that resonance involves a maximum amplitude of oscillations and that this occurs when an oscillating system is forced to oscillate at its natural frequency.	New SLO		Remember	
				[SLO: P-12-D-14]	Describe practical examples of free and forced oscillations.	Matched SLO		Understand	
				[SLO: P-12-D-15]	Describe practical examples of damped oscillations	Matched SLO		Understand	
				[SLO: P-12-D-16]	Justify qualitatively the factors which determine the frequency response and sharpness of the resonance.	Matched SLO		Evaluate	
				[SLO: P-12-D-17]	identify the use of standing waves and resonance in applications	New SLO		Understand	
				[SLO: P-12-D-18]	Justify the importance of critical damping in a car suspension system	Matched SLO		Understand	
				[SLO: P-12-D-19]	Justify that there are some circumstances in which resonance is useful	Matched SLO		Understand	

			Diffraction and Interference	[SLO: P-12-D-20]	Explain experiments that demonstrate two-source interference using water waves in a ripple tank, sound, light and microwaves	New SLO		Understand	
				[SLO: P-12-D-21]	describe the conditions required if two-source interference fringes are to be observed	Modified(rephrased) SLO		Understand	
				[SLO: P-12-D-22]	use $\Delta y=\lambda L/d$ for double-slit interference using light to solve problems	New SLO		Apply	
				[SLO: P-12-D-23]	use $d\sin(\theta)=n\lambda$ to solve problems	Modified (Split) SLO		Apply	
				[SLO: P-12-D-24]	describe the use of a diffraction grating to determine the wavelength of light	Modified (Split) SLO		Understand	
				[SLO: P-12-D-25]	with the context of the electron diffraction double slit experiment, explain the below two of the many interpretations of quantum mechanics: (i) copenhagen interpretation (ii) many worlds interpretation	New SLO		Understand	
				[SLO: P-12-E-01]	define and calculate electric potential	Grade 11 SLO		Apply	
				[SLO: P-12-E-02]	use the fact that the electric field at a point is equal to the negative of potential gradient at that point	Matched SLO		Apply	Understand
				[SLO: P-12-E-03]	state how the concept of electric potential leads to the electric potential energy of two point charges and use $Ep=Qq/(4\pi\epsilon 0\ r)$	Modified(rephrased) SLO		Apply	Understand
				[SLO: P-12-E-04]	define and calculate capacitance	Matched SLO		Apply	

Electricity and Magnetism	1. describe mathematically the nature of static magnetic and electric fields 2. analyze and account for the distribution of current, voltage and resistance in simple DC circuits 3. explain how power can be generated through electromagnetic induction 4. account for how motors make use of electromagnetism to generate kinetic energy 5. analyse AC circuits in terms of current, resistance, reactance, voltage, and impedance	**Benchmark I:** Analyze quantitatively the interactions of electric fields in terms of electric force, field strength, potential and potential energy **Benchmark II:** Derive and use Kirchhoff's laws to describe the design and application of simple circuits **Benchmark III:** Apply quantitatively the principles of magnetic flux, electromagnetic forces, induction and radiation to describe: (1) how electricity can be generated (2) how alternating current in circuits can be regulated (3) the applications of electromagnetic radiation in medical technology	**Electricity**	[SLO: P-12-E-05]	Derive and apply formulae for the combined capacitance of capacitors in series and in parallel	Modified(rephrased) SLO		Apply	
				[SLO: P-12-E-06]	use the capacitance formula for capacitors in series and in parallel	Modified(rephrased) SLO		Apply	Understand
				[SLO: P-12-E-07]	determine the electric potential energy stored in a capacitor from the area under the potential–charge graph	Modified(rephrased) SLO		Understand	
				[SLO: P-12-E-08]	analyze graphs of the variation with time of potential difference, charge and current for a capacitor discharging through a resistor	Modified(rephrased) SLO		Analyse	
				[SLO: P-12-E-09]	Use equations of the form x =x0 (exp ((-t)/RC))	Modified(rephrased) SLO		Apply	
				[SLO: P-12-E-10]	list the use of capacitors in various household appliances	Modified(rephrased) SLO		Remember	
			Bioelectricity	[SLO: P-10-E-11]	Illustrate how bioelectricity is generated in animals	New SLO		Create	Analyse
				[SLO: P-10-E-12]	State that there are several species of aquatic life, such as Electrophorus Electricus, that can naturally generate external electric shocks through internal biological mechanisms that act as batteries	New SLO		Understand	
				[SLO: P-10-E-13]	Explain, with examples of animals with this ability, that electroreception is the ability to detect weak naturally occurring electrostatic fields in the environment	New SLO		Understand	
			AC circuits	[SLO: P-10-E-14]	use the terms period, frequency and peak value as applied to an alternating current or voltage	New SLO		Apply	Understand
				[SLO: P-10-E-15]	use equations of the form x=x0 sin(ωt) representing a sinusoidally alternating current or voltage	Modified(rephrased) SLO		Apply	
				[SLO: P-10-E-16]	use the fact that the mean power in a resistive load is half the maximum power for a sinusoidal alternating current	Modified(rephrased) SLO		Apply	Understand
				[SLO: P-10-E-17]	distinguish between root-mean-square (r.m.s.) and peak values	Modified(rephrased) SLO		Analyse	Understand
				[SLO: P-10-E-18]	Distinguish graphically between half-wave and full-wave rectification	Modified(rephrased) SLO		Analyse	Practical Assessment
				[SLO: P-12-E-19]	explain the use of a single diode for the half-wave rectification of an alternating current	Modified(rephrased) SLO		Understand	
				[SLO: P-12-E-20]	explain the use of four diodes (bridge rectifier) for the full-wave rectification of an alternating current	Modified(rephrased) SLO		Understand	
				[SLO: P-12-E-21]	analyze the effect of a single capacitor in smoothing current flow	Modified(rephrased) SLO		Analyse	

				[SLO: P-12-E-22]	define mutual inductance (M) and self-inductance (L), and their unit henry.	Modified(rephrased) SLO		Remember	
				[SLO: P-12-E-23]	describe the phase of A.C and how phase lags and leads in A.C Circuits.	Modified(rephrased) SLO		Understand	
				[SLO: P-12-E-24]	identify inductors as important components of A.C circuits termed as chokes	Modified(rephrased) SLO		Analyse	Remember
				[SLO: P-12-E-25]	Calculate the reactances of capacitors and inductors.	Modified(rephrased) SLO		Apply	
				[SLO: P-12-E-26]	describe impedance as vector summation of resistances and reactances.	Modified(rephrased) SLO		Understand	
			Quantum Physics	[SLO: P-12-F-01]	state that electromagnetic radiation has a particulate nature	Modified(rephrased) SLO		Apply	Understand
				[SLO: P-12-F-02]	Explain and apply the photonic model of light to solve problems	Modified(rephrased) SLO		Apply	
				[SLO: P-12-F-05]	Explain that a photon has momentum	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-06]	describe that photoelectrons may be emitted from a metal surface when it is illuminated by electromagnetic radiation	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-07]	describe and use the terms threshold frequency and threshold wavelength	Modified(rephrased) SLO		Apply	Undertsand
				[SLO: P-12-F-08]	explain photoelectric emission in terms of photon energy and work function energy	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-09]	state and apply hf= Φ+ 1/2 mvmax^(2)	Modified(rephrased) SLO		Apply	
				[SLO: P-12-F-10]	explain why the maximum kinetic energy of photoelectrons is independent of intensity, whereas the photoelectric current is proportional to intensity	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-11]	Juxtapose the evidence for light as a wave and as a particle	Modified(rephrased) SLO		Analyse	
				[SLO: P-12-F-12]	Analyze qualitatively the evidence provided by electron diffraction for the wave nature of particles	Modified(rephrased) SLO		Analyse	
				[SLO: P-12-F-13]	Explain and apply the de Broglie wavelength to solve problems	Modified(rephrased) SLO		Apply	
				[SLO: P-12-F-14]	State that there are discrete electron energy levels in isolated atoms (e.g. atomic hydrogen)	Modified(rephrased) SLO		Remember	
				[SLO: P-12-F-15]	explain the appearance and formation of emission and absorption line spectra	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-16]	use hf=ΔE to solve problems	Modified(rephrased) SLO		Apply	
				[SLO: P-12-F-17]	Describe the Compton effect qualitatively.	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-18]	Explain the phenomena of pair production and pair annihilation.	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-19]	Explain how electron microscopes achieve very high resolution.	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-20]	State and explain Heisenberg's uncertainty principle qualitatively	Modified(rephrased) SLO		Understand	

				[SLO: P-12-F-21]	Use the uncertainty principle to explain why empirical measurements must necessarily have uncertainty in them	Modified (Split) SLO		Apply	Understand
				[SLO: P-12-F-22]	Recognize the equivalence between energy and mass as represented by E=Δm c^2 and state and use this equation	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-23]	define and use the terms mass defect and binding energy	Modified(rephrased) SLO		Apply	Understand
				[SLO: P-12-F-24]	sketch the variation of binding energy per nucleon with nucleon number	Modified(rephrased) SLO		Apply	Understand
				[SLO: P-12-F-25]	Recall what is meant by nuclear fusion and nuclear fission	Modified(rephrased) SLO		Remember	
				[SLO: P-12-F-26]	Explain the relevance of binding energy per nucleon to nuclear reactions, including nuclear fusion and nuclear fission	Modified(rephrased) SLO		Understand	
				[SLO: P-09-F-26]	Explain how the neutrons produced in fission create a chain reaction and that this is controlled in a nuclear reactor	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-27]	calculate the energy released in nuclear reactions using E=Δm/c^2	Modified(rephrased) SLO		Apply	
				[SLO: P-12-F-28]	Explain that fluctuations in count rate provide evidence for the random nature of radioactive decay	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-29]	explain that radioactive decay is both spontaneous and random	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-30]	define activity and decay constant, and state and use A=λN	Modified(rephrased) SLO		Remember	
				[SLO: P-12-F-31]	Explain half-life with examples	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-32]	use λ = 0.693/t21 to solve numerical problems	Modified(rephrased) SLO		Apply	
				[SLO: P-12-F-33]	state the exponential nature of radioactive decay	Modified(rephrased) SLO		Remember	
Modern Physics	1. Describe the standard model of particle physics 2. Analyze radioactive decay processes 3. Explain the processes of nuclear fusion and fission 4. Explain the postulates and implications of special relativity 5. Use the quantum mechanical model of photons to explain phenomena	**Benchmark I:** Explain and apply knowledge of the basic inter-related postulates of and discoveries from: (1) the special theory of relativity (2) the standard model of particle physics (3) quantum theory **Benchmark II:** Describe and explain, with reference to broad qualitative ideas from relativity, quantum mechanics and particle physics: (1) the structure of atoms and atomic nuclei (2) the origin of radioactivity and its uses and	**Particle Physics**	[SLO: P-12-F-34]	use the relationship x=x0 e^λt	Modified(rephrased) SLO		Apply	Understand

		hazards.		[SLO: P-12-F-35]	describe the function of the principle components of a water moderated power reactor	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-36]	explain why uranium fuel needs to be enriched before use	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-37]	compare the amount of energy released in a fission reaction with the (given) energy released in a chemical reaction.	Modified(rephrased) SLO		Analyse	Understand
				[SLO: P-12-F-38]	Explain what is a medical tracer	New SLO		Understand	
				[SLO: P-12-F-39]	Explain annihilation reactions	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-40]	Illustrate how PET scanning works	New SLO		Create	Analyse
				[SLO: P-12-F-41]	calculate the energy of the gamma-ray photons emitted during the annihilation of an electron-positron pair	Modified(rephrased) SLO		Apply	
				[SLO: P-12-F-42]	Explain that the gamma-ray photons from an annihilation event travel outside the body and can be detected	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-43]	Explain the term luminosity	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-44]	Apply the inverse square law for radiant flux intensity	Modified(rephrased) SLO		Apply	
				[SLO: P-12-F-45]	Define and apply standard candles	New SLO		Apply	
				[SLO: P-12-F-46]	Explain blackbody radiation and apply Wien's displacement law to solve problems	New SLO		Understand	
				[SLO: P-12-F-47]	Apply the Stefan–Boltzmann law to solve problems	New SLO		Apply	
				[SLO: P-12-F-48]	estimate the radius of a star	New SLO		Evaluate	Understand
				[SLO: P-12-F-49]	Explain that the lines in the emission and absorption spectra from distant objects show an increase in wavelength from their known values	Modified(rephrased) SLO		Understand	
				[SLO: P-12-F-50]	explain why redshift leads to the idea that the Universe is expanding	New SLO		Understand	
				[SLO: P-12-F-51]	State and explain Hubble's law and how it leads to the Big Bang theory	New SLO		Understand	
				[SLO: P-12-F-52]	Describe Earth's climate system as a complex system having five interacting components	New SLO		Understand	
				[SLO: P-12-F-53]	Relate ocean currents and wind patterns to the climate system	New SLO		Analyse	Understand
				[SLO: P-12-F-54]	Explain climate inertia	New SLO		Understand	

			Conceptual	[SLO: P-12-F-55]	Explain that climate change can be categorized into internal variations and external forcings:	New SLO		Understand	
				[SLO: P-12-F-56]	Explain how global climate is determined by energy transfer from the Sun	New SLO		Understand	
				SLO: P-12-F-57]	Explain that due to the conservation of angular momentum, the Earth's rotation diverts the air to the right in the Northern Hemisphere and to the left in the Southern hemisphere, thus forming distinct atmospheric cells.	New SLO		Understand	
				[SLO: P-12-F-58]	Explain that ocean water that has more salt has a higher density and differences in density play an important role in ocean circulation.	New SLO		Understand	
				[SLO: P-12-F-59]	Explain how the thermohaline circulation transports heat from the tropics to the polar regions.	New SLO		Understand	
				[SLO: P-12-F-60]	Explain how climate science is a an example of a chaotic system	New SLO		Understand	
				[SLO: P-12-F-61]	Explain that piezo-electric effect and its application in medical science	New SLO		Understand	
				[SLO: P-12-F-62]	Explain how ultrasound can be used to obtain diagnostic information about internal body structures	New SLO		Understand	
				[SLO: P-12-F-63]	Explain that X-rays are produced by electron bombardment of a metal target and calculate the minimum wavelength of X-rays produced from the accelerating p.d.	New SLO		Understand	
				[SLO: P-12-F-64]	Explain the use of X-rays in imaging internal body structures	New SLO		Understand	
				[SLO: P-12-F-65]	Explain how computed tomography (CT) scanning works	New SLO		Understand	
Nature of Science	Students should be able to explain, with examples, what philosophical assumptions underpin the practice of science	**Benchmark I:** Students should be able to: 1. explain the broad schools of thought in debates about the role of beauty in science 2. explain how paradoxes and thought experiments help physicists in scientific inquiry 3. explain the broad debates about whether it is ethical to continue research in outer space and of subatomic particles	**Debates about Beauty in Physics**	[SLO: P-12-G-01]	Explain, with examples, what do thinkers who hold the view that there is inherent mathematical beauty in the natural world mean by: (i) elegance of simplicity (ii) symmetry	New SLO		Understand	
				[SLO: P-12-G-02]	Explain, with an example, a counterargument to the claim that physical truths must be inherently mathematically elegant or display symmetry	New SLO		Understand	
			Debates	[SLO: P-12-G-03]	Describe the main pros and cons in the debate about: (i) whether humans should research whether there are aliens somewhere in the universe (ii) whether research should continue on uncovering the secrets of subatomic particles, given the advent of nuclear weapons	New SLO		Understand	
			Thought experiments	[SLO: P-11-G-04]	Explain how the below thought experiments helped convey important physics concepts that would have been impractical to investigate empirically: (i) Newton's cannonball	New SLO		Understand	

Experimentation Skills	Students should be able to make and record observations, measurements and estimates	**Benchmark I:** Students should be able to design safe experiments		[SLO: P-12-N-01]	Develop and justify safety guidelines for a proposed procedure, that also outline the overall risks of the experiment, keeping in mind: ((i) the apparatus, (ii) the surrounding environment, (iii) need for personal protective equipment)	New SLO	Create	Practical Assessment
		Benchmark I: Create an outline of a complete experimental design for a formulated hypothesis		[SLO: P-12-N-02]	Formulate a testable hypothesis by: a) dentifying the independent variable in the experiment b) Identifying the dependent variable in the experiment c) Identifying the variables that are to be kept constant.	New SLO	Apply	Undertand/Apply
				[SLO: P-12-N-03]	Explain the methods of data collection by: a) Describing the method to be used to vary the independent variable b) Describing how the independent and dependent variables are to be measured c) Describing how other variables are to be kept constant d) Describing, with the aid of a clear labeled diagram, the arrangement of apparatus for the experiment and the procedures to be followed.	New SLO	Understand	
				[SLO: P-12-N-04]	Explain the methods of data analysis by: a) Describing how the data should be used in order to reach a conclusion, including details of derived quantities to be calculated from graphs	New SLO	Understand	
				[SLO: P-12-N-05]	Suggest how technology can be used to digitize data collection by describing as appropriate: a) The use of an oscilloscope (or storage oscilloscope) to measure voltage, current, time and frequency b) How to use light gates connected to a data logger to determine time, velocity and acceleration c) How other sensors can be used with a data logger, e.g. motion sensor	New SLO	Evaluate	
		Benchmark II: Tabulate and graph data appropriately, including use of false origins and tabulating uncertainty estimates		[SLO: P-12-N-06]	Show uncertainty estimates, in absolute terms, beside every value in a table of results	New SLO	Apply	Practical Assessment
		Benchmark III: Estimate data collected to an appropriate number of significant figures, with the uncertainty quoted and express graphically with error bars and lines of best and worst fit		[SLO: P-12-N-07]	Show error bars, in both directions where appropriate, for each point on the graph	New SLO	Apply	Practical Assessment
				[SLO: P-12-N-08]	Draw a straight line of best fit and a worst acceptable straight line through the points on the graph.	New SLO	Create	Practical Assessment
	Students should be able to interpret and evaluate experimental observations and data	**Benchmark I:** Analyse tabular data, plotted linear, polynomial, exponential and logarithmic graphs for how well they fit with the hypothesized theoretical relationship the studied variables by considering the calculated values obtained and their corresponding percentage and absolute uncertainty		[SLO: P-12-N-09]	Rearrange expressions into the forms y = mx + c, y = axn and y = aekx	New SLO	Apply	
				[SLO: P-12-N-10]	Describe how a graph of y against x is used to find the constants m and c in an equation of the form y = mx + c	New SLO	Understand	
				[SLO: P-12-N-11]	Describe how a graph of log y against log x is used to find the constants a and n in an equation of the form y=ax^n	New SLO	Understand	

		uncertainty		[SLO: P-12-N-12]	Describe how a graph of ln y against x is used to find the constants a and k in an equation of the form y=ae^kx	New SLO	Understand	
				[SLO: P-12-N-13]	Decide what derived quantities to calculate from raw data in order to enable an appropriate graph to be plotted.	New SLO	Understand	
				[SLO: P-12-N-14]	Convert absolute uncertainty estimates into fractional or percentage uncertainty estimates and vice versa	New SLO	Apply	
				[SLO: P-12-N-15]	Calculate uncertainty estimates in derived quantities	New SLO	Apply	
				[SLO: P-12-N-16]	Estimate the absolute uncertainty in the gradient of a graph by stating that absolute uncertainty = gradient of line of best fit – gradient of worst acceptable line	New SLO	Analyse	Apply
				[SLO: P-12-N-17]	Estimate the absolute uncertainty in the y-intercept of a graph by stating that absolute uncertainty = y-intercept of line of best fit – y-intercept of worst acceptable line	New SLO	Analyse	Apply
				[SLO: P-12-N-18]	Express a quantity as a value, an uncertainty estimate and a unit.	New SLO	Apply	Understand