## Biology GRADE 11

				GRADE II		_		
						SLOs for Assessme		
<b>.</b>		la		I		1.Assessible / Atta		included in drop
Domains	Standards	Benchmarks	Topic/Title		NCP (2022) - SLO	Status of SLOs	SLOs for	<b>Cognitive Domain</b>
	1.Students should be able to: Define	Benchmark 1: Students will		[SLO: B-11-B-01]	Explain that evolution happens due to			
	evolution and natural selection.	be able to distinguish			variation in organisms and the selection	New SLO		Understand
		evolution from creationism			pressures that organisms face.			
	and inheritance.	and explain the factors that		[SLO: B-11-B-02]	Discuss the evidence that is provided by	Grade 12 SLO		Understand
	Describe how populations change over time	influence evolution and			biogeography	Grade 12 BEO		Chacistana
	and how speciation occurs.	inheritance.		[SLO: B-11-B-03]	Analyze the evidence of evolution that	New SLO	Ambiguana	Understand
	Explain the evidence for common ancestry	Benchmark 2: Students will			comes from molecular biology.	New SLO	Ambiguous	Uniderstand
	and the history of life on Earth.	be able to describe different		[SLO: B-11-B-04]	Differentiate between convergent and			
	Describe the major taxonomic categories and	ideas and models provided to			divergent evolution on the basis of	G 1 12 GI O		A 1
	their characteristics, including the	understand and explain			inheritance of the homologous and	Grade 12 SLO		Analyse
	classification of organisms into species,	evolution and inheritance			analogous structures.			
	genus, family, order, class, phylum, and			[SLO: B-11-B-05]	Describe the Endosymbiotic theory			
	kingdom.				about the mechanism of evolution of	Grade 12 SLO		Understand
					eukaryotes from prokaryotes	01440 12 52 5		Charletana
					Describe the theory of inheritance of			
				[SLO: B-11-B-06]	acquired characters, as proposed by	Grade 12 SLO		Understand
				[SLO: D-11-D-00]	Lamarck with example of giraffe neck	Grade 12 SEO		Chacistana
				[SLO: B-11-B-07]	State the drawbacks in Lamarckism.	Grade 12 SLO		Remember
				[SLO: D-11-D-07]	Describe non vascular plants	Grade 12 SLO		Kemember
				[SLO:B-11-B-08]	-	New SLO	Ambiguous	Understand
				ICT O D 11 D 001	(Bryophytes,)	N. GLO	4 1.	TT 1 . 1
				[SLO:B-11-B-09]	Explain the life cycle of polytrichome	New SLO	Ambiguous	Understand
uc				[SLO:B-11-B-10]	Describe the general features of	New SLO	Ambiguous	Understand
atio					vascular plants			
ific					Identify the division between vascular			
assi				[SLO:B-11-B-11]	plants (pteridophytes, gymnosperms,	New SLO	Ambiguous	Remember
CIE					angiosperms)			
ity				[SLO:B-11-B-12]	Explain the general characteristics	New SLO	Ambiguous	Understand
ersi				[626.5 11 5 12]	pteridophytes		1 miniguous	Chacistana
liv				[SLO:B-11-B-13]	Explain the life cycle of ferns	Modified(rephr		Understand
Sioc				[SEO.B II B 13]		ased) SLO		Onderstand
d B					Describe the general characteristic of	Modified(rephr		Understand
an				[SLO:B-11-B-14	gymnosperms and classify them	ased) SLO		Chacistana
ion				[SLO:B-11-B-15]	Describe the life cycle of pinus	New SLO	Ambiguous	Understand
Evolution and Biodiversity Classification					Describe the general characteristic of	Modified(rephr		Understand
)vo				[SLO:B-11-B-16]	angiosperms and classify them	ased) SLO		Uniderstand
F				[CI O.D 11 D 17]	Explain the life cycle of angiosperms	Modified(rephr		I Indot d
				[SLO:B-11-B-17]		ased) SLO		Understand
					Describe general characteristics and			
				IGI O D 44 D 463	economic importance of the following	N GLO		77.1
				[SLO:B-11-B-18]	angiospermic ·	New SLO	Ambiguous	Understand
					Brassicacaeaefamilies			
					· Brassicacaeae			
					· Solanaceae			

			Daggaga			
			Poaceae			
			Identify that animals are divided into			
		[SLO: B-11-B-19]	two major groups as invertebrate and	New SLO	Ambiguous	Remember
			vertebrate			
			Describe the general characteristics,			
			importance and example of sponges			
		[SLO:B-11-B-20]	cnidarians, Platyhelminthes,	Matched SLO		Understand
		[SEO.D-11-D-20]	Ascelminthes (vermatodes), mollusks,	Whatehed BEO		Chacistana
			annelid, arthropods and echinoderms			
		[SLO:B-11-B-21]	Describe the general characteristics of	Matched SLO		Understand
		[SEO.B II B 21]	chordates and vertebrates.	Whitehed BEO		Onderstand
			Describe the general characteristics of			
		[SLO: B-11-B-22]	amphibians, reptiles, birds and	Matched SLO		Understand
		,	mammals.			
			mumius.			
	Danahmark 1. Dagariba in		Define biechemister/meleculer bi-1	Modified (Split)		
	Benchmark 1: Describe in	[SLO: B-11-C-01]	Define biochemistry/molecular biology			Remember
	detail the structure, chemistry			SLO		
1. Describe the structure and function of	and environment of the four		Describe Briefly the different types of			
the four main biomolecules:	major biomolecules, their		bonds found in biology (hydrogen			
carbohydrates, lipids, proteins, and	types and reactions inside		bonds, covalent bonds,	New SLO	Ambiguous	Understand
nucleic acids.	cells and tissues.		interactions, Ionic, hydrophobic and			
Explain the role of DNA as the genetic		[SLO: B-11-C-02]	hydrophilic interactions etc)			
material and its role in heredity.		[SEC. D II C 02]	Distinguish carbohydrates, proteins,			
Describe the structure of DNA, including						
		[SLO: B-11-C-03]	lipids and nucleic acids as the four	Matched SLO		Analyse
the double helix and the four nitrogenous		,	fundamental kinds of biological			Ž
bases.			molecules.			
Explain the process of DNA replication			Describe and draw sketches of the			
and its importance in cell division.			condensation -synthesis and hydrolysis	Martinelan		II. 1 ( 1
Describe the process of transcription and			reactions for the making and breaking	Matched SLO		Understand
translation, including the role of RNA and		[SLO: B-11-C-04]	of macromolecule polymers.			
ribosomes.		[s=st= == sti]	State the properties of water (high			
1 is obtained.			polarity, hydrogen bonding, high			
				N 1'C' 1/ 1		
		[SLO: B-11-C-05]	specific heat, high heat of vaporization,	Modified(rephr		Remember
		,	cohesion, hydrophobic exclusion,	ased) SLO		
			ionization and lower density of ice)			
			allow it to be the medium of life.			
			Define carbohydrates and classify them.	M . 1 . 101.0		D 1
		[SLO: B-11-C-06]		Matched SLO		Remember
			Compare and contrast the properties			
			and roles of monosaccharides and write	Modified(rephr		Analyse
		[SLO: B-11-C-07]	their formula	ased) SLO		Anaryse
		[SLU: B-11-C-0/]		1		
		rgr O. D. 44 G 000	Compare the isomers and stereoisomers	Matched SLO		Analyse
		[SLO: B-11-C-08]	of glucose.			
		[SLO: B-11-C-09]	Distinguish the properties and roles of	Modified (Split)		Analyse
		[pro. p-11-c-09]	disaccharides	SLO		Allalyse
		[GLO D 44 G 463	Describe glycosidic bonds in	Modified (Split)		TT 1 . 1
		[SLO: B-11-C-10]	disaccharides.	SLO		Understand

[SLO: B-11-C-11]	Describe the structure properties and roles of polysaccharides starch, glycogen, cellulose and chitin.	Modified(rephr ased) SLO		Understand
[SLO: B-11-C-12]	Define protein, amino acid and recognized essential amino acid and structural formula of amino acid.	Matched SLO		Remember
[SLO: B-11-C-13]	Outline the synthesis and breakage of peptide linkages.	Matched SLO		Understand
[SLO: B-11-C-14]	Justify the significance of the sequence of amino acids through the example of sickle cell hemoglobin.	Matched SLO		Evaluate
[SLO: B-11-C-15]	Classify proteins as globular and fibrous proteins.	Matched SLO		Understand
[SLO: B-11-C-16]	List the roles of structural proteins and functional proteins with 3 examples	Modified(rephr ased) SLO		Remember
[SLO: B-11-C-17]	Define lipids	Modified (Split) SLO		Remember
[SLO: B-11-C-18]	Describe the properties and roles of acylglycerols, phospholipids, terpenes and waxes.	Modified (Split) SLO		Understand
[SLO: B-11-C-19]	Illustrate the molecular structure (making and breaking) of an acylglycerol, a phospholipid and a terpene.	Matched SLO		Apply
[SLO: B-11-C-20]	Evaluate steroids and prostaglandins as important groups of lipids	Modified(rephr ased) SLO		Understand
[SLO: B-11-C-21]	Describe nucleic acids and molecular structure of nucleotides.	Modified(rephr ased) SLO		Understand
[SLO: B-11-C-22]	Distinguish among the nitrogenous bases found in the nucleotides of nucleic acids.	Matched SLO		Analyse
[SLO: B-11-C-23]	Outline the examples of a mononucleotide (ATP) and a dinucleotide (NAD).	Matched SLO		Understand
[SLO: B-11-C-24]	Illustrate the formation of phosphodiester bond.	New SLO	Ambiguous	Apply
[SLO: B-11-C-25]	Explain the double helical structure of DNA as proposed by Watson and Crick.	Matched SLO		Understand
[SLO: B-11-C-26]	Explain the general structure of RNA.	Matched SLO		Understand
[SLO: B-11-C-27]	Distinguish in terms of functions and roles, the three types of RNA	Matched SLO		Analyse
[SLO: B-11-C-28]	Discuss the Central Dogma.	New SLO	Ambiguous	Understand
	Define conjugated molecules and describe the roles of common conjugated molecules i.e. glycolipids, glycoproteins, lipoproteins and	Matched SLO	9	Remember
[SLO: B-11-C-29]	nucleoproteins.			

	<ol> <li>Describe the structure and function of cells, including prokaryotic and eukaryotic cells.</li> <li>Identify and describe the main subcellular organelles, including the nucleus,</li> </ol>	Benchmark 1: Students will be able to describe the function and draw the structure of cells and cell organelles, including the	[SLO: B-11-D-01]	Describe that cells are the basic unit of life with respect to 7 properties of Life. (Movement, Respiration, Homeostasis, Growth, Reproduction, Excretion, Nutrition)	New SLO	Ambiguous	Understand
	mitochondria, ribosomes, endoplasmic reticulum, Golgi apparatus, lysosomes, and	nucleus, mitochondria, ribosomes, and endoplasmic	[SLO: B-11-D-02]	Identify the ultrastructure of animal and plant cells.	New SLO	Ambiguous	Remember
	peroxisomes. 3) Explain the role of the cell membrane and describe its structure. 4) Explain the process of cellular respiration and its role in producing energy. 5Describe the process of cellular division, including mitosis and meiosis.	reticulum, and how they interact to maintain cellular homeostasis and communicate with each other. <b>Benchmark 2:</b> Students will be able to understand terms such as stem cells, the structure of cell membrane and its role in transport of	[SLO: B-11-D-03]	Describe the structure and functions of sub-cellular organelles. (mitochondria, nucleus -cell membrane, chloroplast, lysosomes, cell wall, centrioles, - Golgi apparatus, smooth endoplasmic reticulum, rough endoplasmic reticulum, vesicles, peroxisome, vacuoles, ribosomes	New SLO	Ambiguous	Understand
		material.		Define cell signalling.	New SLO	Ambiguous	Remember
				Discuss the pathway of a signal from outside the cell to the inside. (Protein signal and steroid signal)	New SLO	Ambiguous	Analyse
lles			[SLO:B-11-D-06]	Define Stem cells and advantages of using stem cells	New SLO	Ambiguous	Remember
ame			[SLO: B-11-D-07]	Categorize different types of stem cells	New SLO	Ambiguous	Analyse
ılar Orga			[SLO: B-11-D-08]	Evaluate the advantages and disadvantages of using induced Pluripotent Stem Cells.	New SLO	Ambiguous	Analyse
Subcellt				Explain the structure of the cell membrane and the techniques that can be used to study it.	New SLO	Ambiguous	Understand
Cells and Subcellular Organelles				Explain the 4 membrane transport mechanisms with diagrams: (simple diffusion, Facilitated diffusion, Osmosis, Active transport).	New SLO	Ambiguous	Understand
			[SLO: B-11-D-11]	Differentiate between prokaryotic and eukaryotic cells with diagrams.	New SLO	Ambiguous	Understand
			[SLO: B-11-D-12]	State cell theory (including how to validate it and exceptions to it.)	New SLO	Ambiguous	Remember
			[SLO: B-11-D-13]	Compare and constrast the workings of a light microscope and electron microscope with focus on resolution and magnificatiton and live vs dead samples.	New SLO	Ambiguous	Understand

			[SLO: B-11-D-14]	Write the chemical structure of a single phospholipid (Glycerol as a three carbon molecule, phosphate group, one unsaturated fatty acid tail and one saturated fatty acid tail).	New SLO	Ambiguous	Remember
			[SLO: B-11-D-15]	Describe endocytosis and exocytosis with diagrams.	New SLO	Ambiguous	Understand
			[SLO: B-11-D-16]	Compare and contrast simple and facilitated diffusion.	New SLO	Ambiguous	Understand
			[SLO: B-11-D-17]	Explain the steps of mitosis and meiosis with diagrams.	New SLO	Ambiguous	Understand
Define metabolism and describe how it is related to cellular respiration and	Benchmark 1: Students will be able to explain the role of		[SLO: B-11-F-01]	Identify the role and component parts of the active site of an enzyme.	Matched SLO		Remember
photosynthesis. Explain the role of enzymes in metabolic reactions and describe the process of enzyme- catalyzed reactions.	enzymes in biological systems, including the facilitation of chemical reactions and regulation of	stems, including the cilitation of chemical	[SLO: B-11-F-02]	Differentiate among the three types of co-factors i.e. in organic prosthetic group and co-enzymes, with examples.	Matched SLO		Understand
Define enzymes and explain their role in metabolic reactions.  Describe the factors that affect enzyme activity, including temperature, pH, and	metabolic pathways. <b>Benchmark2:</b> Students will be able to describe the factors that affect enzyme activity,		[SLO: B-11-F-03]	Explain the mechanism of enzyme action through the Induced Fit Model, including comparing it with Lock and Key Model.	Matched SLO		Understand
substrate concentration.  Explain the importance of enzymes in	including temperature, pH, substrate concentration, and		[SLO: B-11-F-04]	Explain enzyme catalysis with example of specific reactions	Modified(rephr ased) SLO		Understand
maintaining homeostasis and how disturbances can lead to disease.	inhibitors, and explain how these factors can be used to control enzyme activity. <b>Benchmark3:.</b> Explain in		[SLO: B-11-F-05]	Define energy of activation and discuss through graph how an enzyme speeds up a reaction by lowering the energy of activation.	Matched SLO		Remember
	detail how photosynthesis and Respiration occurs and understand the processes		[SLO: B-11-F-06]	Explain the effect of temperature on the rate of enzyme action with example of human and thermophilic bacteria	Modified(rephr ased) SLO		Understand
	involved.		[SLO: B-11-F-07]	Investigate the effect of pH on enzyme activity Compare the optimum pH of different enzymes like trypsin, pepsin, papain.	Modified(rephr ased) SLO		Analyse
			[SLO: B-11-F-08]	Demonstrate that the concentration of enzyme affects the rate of enzyme action	Modified(rephr ased) SLO		Understand
			[SLO: B-11-F-09]	Describe enzymatic inhibition, its types and its significance with examples .	Modified(rephr ased) SLO		Understand
			[SLO: B-11-F-10]	Name the molecules which act as inhibitors.	Matched SLO		Remember
			[SLO: B-11-F-11]	Categorize inhibitors into competitive and non-competitive inhibitors.	Matched SLO		Understand
				Explain feedback inhibition.	Matched SLO		Understand

	Classify enzymes on the basis of the				
	reactions catalyzed (oxido-reductases,	Matched SLO		Analyse	
FOX O. D. 11 D. 103	transferases, hydrolases, isomerases,			Ž	
[SLO: B-11-F-13]	and ligases).				
	Classify enzymes on the basis of the				
101 O D 11 D 14	substrates they use (lipases, diastase,	Matched SLO		Analyse	
[SLO: B-11-F-14]	amylase, proteases etc)	3.6 1°C 1/ 1			
[SLO: B-11-F-15]	Explain the role of light, carbon dioxide	Modified(rephr	J	Inderstand	
	and water in photosynthesis	ased) SLO			
[CLO. D 11 E 16]	Identify the two general kinds of	Matabad CLO		) l	
[SLO: B-11-F-16]	photosynthetic pigments (carotenoids	Matched SLO	1	Remember	
	and chlorophylls)  Describe the roles of photosynthetic				
[CLO. D 11 E 17]		Matched SLO	,	Inderstand	
[SLO: B-11-F-17]	pigments in the absorption and conversion of light energy.	Matched SLO		Jilderstalld	
	Differentiate between the absorption				
[SLO: B-11-F-18]	spectra of chlorophyll 'a' and 'b'	Matched SLO	J	Inderstand	
	Describe the arrangement of				
[SLO: B-11-F-19]	photosynthetic pigments in the form of	Matched SLO	ī	Inderstand	
[SLO: B-11-F-19]	photosystem-I and II.	Matched SLO		Jideistand	
	Describe the events of non-cyclic				
[SLO: B-11-F-20]	photophosphorylation and cyclic	Modified(rephr	ī	Inderstand	
[SLO: D-11-1-20]	photophosphorylation.	ased) SLO		Juderstand	
	Explain the Calvin cycle (the				
[SLO: B-11-F-21]	regeneration of RuBP should be	Matched SLO	1	Inderstand	
[SLO: D-11-1-21]	understood in outline only.)	Wateried SEO		Juderstand	
	Explain the process of anaerobic				
	respiration in terms of glycolysis and				
[SLO: B-11-F-22]	conversion of pyruvate into lactic acid	Matched SLO	J	Jnderstand	
	or ethanol.				
	Illustrate the links reaction as	Modified(rephr			
[SLO: B-11-F-23]	conversion of pyruvate to acetyl-CoA.	ased) SLO		Apply	
[CLO. D 11 F 24]		Modified(rephr	T	I I	
[SLO: B-11-F-24]	Outline the steps of Krebs cycle.	ased) SLO	'	Inderstand	
[CLO. D 11 E 25]	Trace the passage of electrons through	Modified(rephr	1	Remember	
[SLO: B-11-F-25]	the electron transport chain.	ased) SLO	1	Kemember	
[SLO: B-11-F-26]	Describe chemiosmosis and Relate it	Matched SLO	1	Inderstand	
[SLO: B-11-F-20]	with electron transport chain	Matched SLO	(	Jilderstand	
	Explain the substrate-level				
[SLO: B-11-F-27]	phosphorylation during which exergonic	Matched SLO	ī	Inderstand	
[SLO: D-11-F-27]	reactions are coupled with the synthesis	Matched SLO	'	Jideistand	
	of ATP.				
[SLO: B-11-F-28]	Justify the importance of G3P in	Modified(rephr	T	Inderstand	
[SLO. D-11-F-20]	photosynthesis	ased) SLO	(	Jideistallu	
[SLO: B-11-F-29]	Outline the formation of acetyl CoA	Modified (Split)	T	Jnderstand	
[SLO. D-11-F-29]	from fats	SLO	(	Jideistalid	
[SLO: B-11-F-30]		Modified (Split)	T	Inderstand	
[DLO. D-11-F-30]	and glucose.	SLO	(	mucistanu	

		[SLO: B-11-F-31]	Define photorespiration	Modified (Split) SLO		Remember
		[SLO: B-11-F-32]	Outline the events occurring through photorespiration.	Modified (Split) SLO		Understand
		[SLO: B-11-F-33]	Rationalize how the disadvantageous process of photorespiration evolved.	Matched SLO		Understand
		[SLO: B-11-F-34]	Explain the effect of temperature on the oxidative activity of RuBP carboxylase.	Matched SLO		Understand
		[SLO: B-11-F-35]	Outline the process of C 4 photosynthesis as an adaptation evolved in some plants to deal with the problem of photorespiration.	Matched SLO		Understand
Describe the processes of reproduction in organisms, including asexual and sexual reproduction.	Benchmark 1: Students will be able to explain the laws of inheritance, including the	[SLO:B-11- H-01]	Describe the structures of the male reproductive system and identify their functions	Grade 12 SLO		Understand
Explain the role of meiosis in producing genetically diverse offspring.	principles of dominant and recessive genes, segregation,	[SLO:B-11-H-02]	Define male reproductive hormones and explain their functions	New SLO	Ambiguous	Remember
Describe the structure and function of gametes and the role of fertilization in sexual reproduction.	and independent assortment, and demonstrate an understanding of how traits	[SLO: B-11-H-03]	Explain the structures of female reproductive system and describe their functions	Grade 12 SLO		Understand
Explain the patterns of inheritance, including dominant and recessive traits, and how they	are passed from one generation to the next.	[SLO: B-11-H-04]	Describe the menstrual cycle and the hormones involved.	Grade 12 SLO		Understand
are influenced by genes and chromosomes.  Describe how genetic variation and mutations can lead to evolutionary change.  Describe the central dogma of molecular	BENCHMARK2: Students	[SLO: B-11-H-05]	Define gene (as a sequence of nucleotides as part of DNA, which codes for the formation of a polypeptide.)	Grade 12 SLO		Remember
biology, which outlines the flow of genetic information from DNA to RNA to protein. Explain the basic structure and function of genes, including the role of codons and	Benchmark 3: Students will be able to understand the process of translation and transcription as part of the	[SLO: B-11-H-06]	Explain the law of segregation and independent assortment, using a suitable example related to the pea plants.	Grade 12 SLO		Understand
introns.  Distinguish between different types of inheritance patterns, including dominant and	protein synthesis process.	[SLO: B-11-H-07]	Relate the Law of independent assortment to random orientation of chromosomes during Meiosis	Grade 12 SLO		Apply
recessive traits, and sex-linked traits.		[SLO: B-11-H-08]	Express limitations of independent assortment and its usefulness.	Grade 12 SLO		Understand
		[SLO: B-11-H-09]	Show that independent assortment leads to variation in the gametes.	Grade 12 SLO		Understand
		[SLO: B-11-H-10]	Evaluate that inheritance of genes and their mixing during fertilization is based on mathematical probabilities.	Grade 12 SLO		Understand
		[SLO: B-11-H-11]	Describe the exceptions to the Mendel's laws of inheritance.	Grade 12 SLO		Understand
		[SLO: B-11-H-12]	Explain incomplete dominance and exemplify it through the inheritance of flower color in 4 O' clock plant.	Grade 12 SLO		Understand

[SLO: B-11-H-13]	Differentiate between incomplete dominance and codominance.	Grade 12 SLO	Understand
[SLO: B-11-H-14]	Define alleles and multiple alleles	Grade 12 SLO	Remember
[SLO: B-11-H-15]	State the alleles responsible for the trait of ABO blood groups.	Grade 12 SLO	Remember
[SLO: B-11-H-16]	Explain the case where two alleles have equal dominance through the genetics of human blood group AB.	Grade 12 SLO	Understand
[SLO: B-11-H-17]	Name the various human blood group systems.	Grade 12 SLO	Remember
[SLO: B-11-H-18]	Investigate the reasons for O-ve individual as the Universal donor and AB +ve as the Universal recipient.	Grade 12 SLO	Understand
[SLO: B-11-H-19]	Describe the occurrence of some other blood group systems.	Grade 12 SLO	Understand
[SLO: B-11-H-20]	Associate the positive and negative blood groups with the presence and absence of Rh factor.	Grade 12 SLO	Understand
[SLO: B-11-H-21]	Justify why Rh incompatibility could be a danger to the developing fetus and mother.	Grade 12 SLO	Analyse
[SLO: B-11-H-22]	Explain Erythroblastosis fetalis in the light of antigen-antibody reaction.	Grade 12 SLO	Understand
[SLO: B-11-H-23]	Suggest measures to counter the problem of Erythroblastosis fetalis before it occurs.	Grade 12 SLO	Understand
[SLO: B-11-H-24]	Define and relate the terms; polygenic and epistasis.	Grade 12 SLO	Remember
[SLO: B-11-H-25]	Describe polygenic inheritance using suitable examples from plants (grain color in wheat) and animals (skin color in man).	Grade 12 SLO	Understand
[SLO: B-11-H-26]	List at least five polygenic traits discovered in humans.	Grade 12 SLO	Remember
[SLO: B-11-H-27]	Give one example of epistasis from mammals (coat color inheritance in Labrador retrievers) and one from plants (pigment phenotype in foxgloves) and justify modified Mendelian ratios.	Grade 12 SLO	Understand
[SLO: B-11-H-28]	Describe the terms gene linkage and crossing over.	Grade 12 SLO	Understand
[SLO: B-11-H-29]	Explain that gene linkage counters independent assortment and crossing-over modifies the progeny.	Grade 12 SLO	Understand

[SLO: B-11-H-30]	Suggest that linkage can be observed / evaluated only if the number of progeny is quite large.	Grade 12 SLO	Understand
[SLO: B-11-H-31]	Explain the XX-XY mechanism of sex determination in mammals.	Grade 12 SLO	Understand
[SLO: B-11-H-32]	Identify male and female individuals from the karyotype of man.	Grade 12 SLO	Remember
[SLO: B-11-H-33]	Solve the genetics problems related to XX-XY, sex determination.	Grade 12 SLO	
[SLO: B-11-H-34]	Describe the concept of sex-linkage.	Grade 12 SLO	Understand
[SLO: B-11-H-35]	Explain the inheritance of sex-linked traits (eye color) in Drosophila.	Grade 12 SLO	Understand
[SLO: B-11-H-36]	Describe the sex-linked inheritance of male characters due to Y-chromosome and the effect of Hollandric genes.	Grade 12 SLO	Understand
[SLO: B-11-H-37]	Describe the X- linked disorders with reference to the patterns of inheritance.	Grade 12 SLO	Understand
[SLO: B-11-H-38]	Name some of the sex-linked disorders of man (Red green color blindness, Hemophilia).	Grade 12 SLO	Remember
[SLO: B-11-H-39]	Explain the techniques employed for embryonic screening e.g., Amniocentesis and Chorionic Villus Sampling	Grade 12 SLO	Understand
[SLO: B-11-H-40]	Annotate the detailed structure of a chromosome.	Grade 12 SLO	Understand
[SLO: B-11-H-41]	Narrate the experimental work of Griffith and Hershey-Chase, which proved that DNA is the hereditary material	Grade 12 SLO	Understand
[SLO: B-11-H-42]	Describe the three models proposed about the mechanism of DNA replication.	Grade 12 SLO	Understand
[SLO: B-11-H-43]	Narrate the work of Meselson and Stahl to justify the semi-conservative replication as the correct method of replication.	Grade 12 SLO	Understand
[SLO: B-11-H-44]	Describe the events of the process of DNA replication.	Grade 12 SLO	Understand
[SLO: B-11-H-45]	Describe DNA stability and variability as two characters of the replicating DNA molecule.	Grade 12 SLO	Understand

between and among biotic and abiotic factors.	explain the basic principles of ecology, tropic levels and	[SLO: B-11-N-02]	Distinguish between the various modes of nutrition different species possess.	New SLO	Ambiguous	Understand
Describe the role of living organisms in their environment, including the relationships	Benchmark 1: Students will be able to describe and	[SLO: B-11-N-01]	Define species, population, community and ecosystem.	New SLO	Ambiguous	Remember
			Describe the symptoms, causes and possible available treatments of some of the gene mutations	Grade 12 SLO		Understand
		[SLO: B-11-H-60]	Describe the symptoms, causes and possible available treatments of some of the chromosomal mutations. (Down's, Klinefelter's and Turner's syndrome)	Grade 12 SLO		Understand
			Rationalize that mutations might be a contributing factor towards evolution.	Grade 12 SLO		Analyse
		[SLO: B-11-H-58]	Justify most mutations are harmful.	Grade 12 SLO		Analyse
		[SLO: B-11-H-57]	Differentiate between natural and induced mutations and mutagens.	Grade 12 SLO		Understan
		[SLO: B-11-H-56]	Define mutation and identify various sources of mutation.	Grade 12 SLO		Remembe
		[SLO: B-11-H-55]	Describe the positive control of gene expression by activator proteins.	Grade 12 SLO		Understan
		[SLO: B-11-H-54]	Describe the negative control of gene expression by repressor proteins.	Grade 12 SLO		Understan
		[SLO: B-11-H-53]	State the importance of the regulation of gene expression.	Grade 12 SLO		Understan
		[SLO: B-11-H-52]	Suggest possible ways in which the synthesized protein can be used within or outside a cell that synthesized it.	Grade 12 SLO		Understan
			State the difference between protein synthesis in prokaryotes and eukaryotes	Grade 12 SLO		Understan
			Describe the mechanism of protein synthesis.	Grade 12 SLO		Understan
			Explain why the length of transcribed mRNA molecule (in Eukaryotes) shortens as it enters the cytoplasm for translation.	Grade 12 SLO		Understand
			Explain the mechanism of transcription.	Grade 12 SLO		Understan
			Differentiate between the terms genetic code and codon.	Grade 12 SLO		Understan
			Describe the characteristics of genetic code (universal, triplet, non-overlapping, degenerate, has no punctuation).	Grade 12 SLO		Understan

	Describe the structure and function of ecosystems, including biomes, communities,	energy transfer between them.		Identify plants as producers for converting light energy to chemical	New SLO	Ambiguous	Remember
	populations, and individuals.	Benchmark 2: Students will	[SLO: B-11-N-03]	energy			
	Analyze the effects of human activities on the environment and the impact on	be able to analyze and interpret ecological data,	[SLO: B-11-N-04]	Define trophic levels.  Discuss the loss of energy between	New SLO	Ambiguous	Remember
	biodiversity.	including species	[SLO: B-11-N-05]	trophic levels.	New SLO	Ambiguous	Understand
	Evaluate the methods used to monitor and manage environmental resources, such as habitat restoration and conservation.	interactions, food webs, energy flow, and nutrient cycling. Additionally,	[SLO: B-11-N-06]	Explain the greenhouse effect with examples of gases that exhibit this behavior.	New SLO	Ambiguous	Understand
	Describe the processes that drive the cycling of matter and energy in ecosystems,	students will be able to evaluate and discuss the	[SLO: B-11-N-07]	Describe the harmful effects of greenhouse gases on the environment.	New SLO	Ambiguous	Understand
	including photosynthesis, cellular respiration, and decomposition.	impacts of human activities (e.g., pollution, habitat destruction, introduction of non-native species) on	[SLO: B-11-N-08]	Explain with regards to ocean acidification coral reefs are used as a barometer for the health of an aquatic ecosystem.	New SLO	Ambiguous	Understand
		ecosystems and biodiversity.	[SLO: B-11-N-09]	Define biogeochemical cycles and locate the primary reservoirs of the chemicals in these cycles.	New SLO	Ambiguous	Remember
			[SLO: B-11-N-10]	Describe the water cycle in detail.	New SLO	Ambiguous	Understand
<b>G</b>			[SLO: B-11-N-11]	Define the terms aquifers and water table.	New SLO	Ambiguous	Remember
			[SLO: B-11-N-12]	Discuss nitrogen cycle in detail.	New SLO	Ambiguous	Analyse
			[SLO: B-11-N-13]	Describe productivity in terms of gross primary productivity and net primary productivity.	New SLO	Ambiguous	Understand
			[SLO: B-11-N-14]	Interpret the pyramids of number, biomass and energy.	New SLO	Ambiguous	Apply
			[SLO: B-11-N-15]	Define ecological succession as the process through which ecosystems change from simple to complex.	New SLO	Ambiguous	Remember
			[SLO: B-11-N-16]	Describe primary and secondary succession.	New SLO	Ambiguous	Understand
			[SLO: B-11-N-17]	Differentiate between xerarch and hydrarch succession.	New SLO	Ambiguous	Analyse
			[SLO: B-11-N-18]	Explain the xerarch succession on a bare rock starting from the small pockets of lichens to the vegetations of flowering plants.	New SLO	Ambiguous	Understand
			[SLO: B-11-N-19]	Describe characteristics of a population, such as growth, density, distribution, carrying capacity, minimum/viable size.	New SLO	Ambiguous	Understand
			[SLO: B-11-N-20]	Explain the effect of growth of human population on the ecosystem and	New SLO	Ambiguous	Understand
			[SLO: B-11-N-21]	Describe the 4 important ecosystems of Pakistan	New SLO	Ambiguous	Understand

Explain the differences in structure and cells. Classify and describe the diversity of organisms within the domains of Bacteria and protists, and fungi. Archaea. Describe the unique characteristics and functions of protists, including those that are unicellular, colonial, or multicellular. Explain the importance of fungi in the ecosystem, including their role in decomposition, nutrient cycling, and symbiotic relationships with other organisms. role in nutrient cycling, Compare and contrast the different modes of nutrition and lifestyle of prokaryotes, protists, mutualistic relationships. and fungi.

Benchmark 1: Students will function between prokaryotic and eukaryotic be able to distinguish and compare the structures and functions of prokaryotes, Benchmark 2: Evaluate the molecular and genetic structures of Bacteria and their life cycles. Benchmark 3: Explain the ecological significance of these organisms, including their decomposition, and

prokaryotes in terms of domains archaea and bacteria and in terms of kingdom monera.  Explain the phylogenetic position of prokaryotes.  Justify the occurrence of bacteria in the widest range of habitats.  Draw an annotated diagram of a generalized bacterial cell.  Justify cyanobacteria are considered as the most prominent of the photosynthetic bacteria.  [SLO: B-11-O-05]  Describe detailed structure and chemical composition of bacterial cell.  Wall and other coverings.  Compare cell wall differences in Gramposition of positive and Gram-negative bacteria.  [SLO: B-11-O-06]  Illustrate with diagrams the great diversity of shapes and sizes found in bacteria.  [SLO: B-11-O-09]  Scott be photosynthesis mechanisms of survival to withstand unfavorable conditions.  [SLO: B-11-O-10]  Explain motility in bacteria.  Describe detailed structure and chemical composition of bacteria lell wall and other coverings.  Compare cell wall differences in Gramposition of positive and Gram-negative bacteria.  Illustrate with diagrams the great diversity of shapes and sizes found in bacteria.  Illustrate with diagrams to the preat diversity of shapes and sizes found in bacteria.  SLO: B-11-O-09]  Scott be promised to the structure of bacteria as a mechanism of survival to withstand unfavorable conditions.  SLO: B-11-O-10]  Explain motility in bacteria.  Describe penomic organization of bacteria diplenum.  Describe penomic organization of bacteria and other photosynthetic bacteria.  List the phases in the growth of bacteria.  List the phases in the growth of bacteria.  Describe different methods of peroduction in bacteria.  Describe different methods of provide the photosynthetic bacteria.  Describe different methods of provide to different methods of patceria.  Explain the use of bacteria.  Matched SLO  Understand and betteria of bacteria.  Matched SLO  Understand different met	[SLO: B-11-O-01]	Outline the taxonomic position of			
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Prokaryote			[SLO: B-11-O-21]	Describe important bacterial diseases in man e.g. cholera, typhoid, tuberculosis, and pneumonia; emphasizing their symptoms, causative bacteria, treatments, and preventative measures.	Matched SLO		Understand
			[SLO: B-11-O-22]	Describe important bacterial diseases in plants in terms of spots, blights, soft rots, wilts, and galls; emphasizing their symptoms, causative bacteria, and preventative measures.	Matched SLO		Understand
			[SLO: B-11-O-23]	Define the term normal flora.	Matched SLO		Remember
			[SLO: B-11-O-24]	Describe the benefits of the bacterial flora of humans.	Matched SLO		Understand
			[SLO: B-11-O-25]	List the chemical and physical methods used to control harmful bacteria.	New SLO	Ambiguous	Remember
			[SLO: B-11-O-26]	Explain protists as a diverse group of eukaryotes that has polyphyletic origin and defined only by exclusion from other groups.	Matched SLO		Understand
			[SLO: B-11-O-27]	Describe the salient features with examples of protozoa, algae, myxomycota and oomycota as the major groups of protists.	Matched SLO		Understand
			[SLO: B-11-O-28]	Justify how protists are important for humans.	Matched SLO		Analyse
			[SLO: B-11-O-31]	Classify fungi into zygomycota, ascomycota, deutromycota and basidiomycota and give the diagnostic features of each group.	Matched SLO		Understand
			[SLO: B-11-O-32]	Explain yeast as unicellular fungi that are used for baking and brewing and are also becoming very important for genetic research.	Matched SLO		Understand
			[SLO: B-11-O-33]	Name a few fungi from which antibiotics are obtained.	Matched SLO		Remember
				Explain the mutualism established in mycorrhizae and lichen associations.	Matched SLO		Understand
			[SLO: B-11-O-35]	Give examples of edible fungi.	Matched SLO		Understand
			[SLO: B-11-O-36]	Describe the ecological impact of fungi causing decomposition and recycling of materials.	Matched SLO		Understand
			[SLO: B-11-O-37]	Discuss the pathogenic role of fungi.	Matched SLO		Understand
			[520. 2 11 0 37]	= and me paniogenie role of rungh	Muchou BLO		Chacistina
	Describe the characteristics and diversity of acellular life, including viruses and viroids.	Benchmark 1: Students should be able to analyze the	[SLO: B-11-P-01]	Justify the status of viruses among living and non-living things.	Matched SLO		Understand
	Explain the replication and infection cycles of viruses.	role of acellular life forms in maintaining the balance of	[SLO: B-11-P-02]	Trace the history of viruses since their discovery.	Matched SLO		Understand

Compare and contrast the structure and function of virus particles.	ecosystems, causing diseases, and in biotechnology	[SLO	O: B-11-P-03]	Classify viruses on the bases of their hosts and structure.	Matched SLO		Understand
Analyze the impacts of viruses on human health and the environment.	applications. Benchmark 2: Students should be able to		O: B-11-P-04]	Describe the structure of a model bacteriophage, and HIV and.	Matched SLO		Understand
Evaluate the current methods for controlling and preventing viral infections.	analyze the role of acellular life forms in maintaining the balance of ecosystems,	[SLC	O: B-11-P-05]	Justify that a virus must have a host cell to parasitize in order to complete its life cycle.	Matched SLO		Evaluate
	causing diseases and the treatment of these diseases.	[SLC	O: B-11-P-06]	Explain a virus survives inside a host cell, protected from the immune system.	Matched SLO		Understan
		[SLC	O: B-11-P-07]	Determine the method a virus employs to survive/ pass over unfavorable conditions when it does not have a host to complete the life cycle.	Matched SLO		Evaluate
		[SLC	O: B-11-P-08]	Describe the Lytic and Lysogenic life cycles of a virus.	Matched SLO		Understar
		[SLC	O: B-11-P-09]	Outline the usage of bacteriophage in genetic engineering.	Matched SLO		Understar
		[SLO	O: B-11-P-10]	Explain the life cycle of HIV.	Matched SLO		Understar
				Justify the name of the virus i.e., "Human Immunodeficiency Virus" by establishing T-helper cells as the basis	Matched SLO		Analyse
			O: B-11-P-11] O: B-11-P-12]	of immune system.  Reason out the specificity of HIV on its host cells.	Matched SLO		Understar
			O: B-11-P-13]	List the symptoms of AIDS.	Matched SLO		Remembe
			O: B-11-P-14]	Explain opportunistic diseases that may attack an AIDS victim.	Matched SLO		Understar
		[SLC	O: B-11-P-15]	Describe the treatments available for AIDS.	Matched SLO		Understa
		[SLC	O: B-11-P-16]	List some common control measures against the transmission of HIV.	Matched SLO		Remembe
		[SLC	O: B-11-P-17]	Describe the causative agent, symptoms, treatment and prevention of the following viral diseases:hepatitis C, herpes, polio and leaf curl virus disease of cotton.	Matched SLO		Understar
		[SLC	O: B-11-P-18]	List the sources of transmission for each of the above-mentioned diseases.	Matched SLO		Remembe
		[SLC	O: B-11-P-19]	Describe the structure of prions and viroids.	Matched SLO		Understar
		[SLC	O: B-11-P-20]	List the diseases caused by prions and viroids.	Matched SLO		Remembe
		[SLC	O: B-11-P-21]	Interpret how viral infections cause global economic loss.	New SLO	Ambiguous	Apply
		[SLC	O: B-11-P-22]	Describe the limitations of the vaccine for the common cold / flu virus	New SLO	Ambiguous	Understar

Describe the basic structure and anatomy of plant cells and organs, including stems, roots, leaves, and flowers.

Benchmark 1: Students should be able to describe the unique characteristics and

Explain the process of photosynthesis, including the role of chlorophyll and other pigments.

Discuss the significance of seeds and the different methods of seed dispersal.

Describe the basic processes of plant growth and development, including germination, shoot and root development, and the role of hormones.

Outline the adaptations that allow plants to survive in different environments, including ways to conserve water, regulate temperature, and defend against herbivores.

Benchmark 1: Students should be able to describe the unique characteristics and adaptations of different types of plants, their life cycles and life processes including respiration, photosynthesis, nutrient intake and movement of water and sugar. Benchmark 2: Explain osmotic adjustment in plants and be acquanited with growth and movement in plants in response to environmental factors.

[SLO: B-11-Q-01]	List the macro and micronutrients of plants highlighting the role of each nutrient.	Matched SLO	Remember
[SLO: B-11-Q-02]	State the examples of carnivorous plant.	Matched SLO	Remember
[SLO: B-11-Q-03]	Explain the role of stomata and palisade tissue in the exchange of gasses in plants.	Matched SLO	Understand
[SLO: B-11-Q-04]	Relate transpiration with gas exchange in plants.	Matched SLO	Apply
[SLO: B-11-Q-05]	Assess the structure of xylem vessel elements, sieve tube elements, companion cells, tracheids and relate their structures with functions.	Modified(rephr ased) SLO	Understand
[SLO: B-11-Q-06]	Discuss the movement of water between plant cells, and between the cells and their environment in terms of water potential.	Modified(rephr ased) SLO	Understand
[SLO: B-11-Q-07]	Describe the movement of water through roots in terms of symplast, apoplast and vacuolar pathways.	Modified(rephr ased) SLO	Understand
[SLO: B-11-Q-08]	Explain the movement of water in xylem through TACT mechanism.	Matched SLO	Understand
[SLO:B-11-Q-09]	Describe the mechanisms involved in the opening and closing of stomata.	Matched SLO	Understand
[SLO: B-11-Q-10]	Explain the movement of sugars within plants.	Matched SLO	Understand
[SLO: B-11-Q-11]	Define osmotic adjustment.	Matched SLO	Remember
[SLO: B-11-Q-12]	State movement of water into or out of the cell in isotonic, hypotonic, and hypertonic conditions.	Modified(rephr ased) SLO	Understand
[SLO: B-11-Q-13]	Explain the osmotic adjustments in hydrophytic (marine and freshwater), xerophytic and mesophytic plants and plants in saline soil.	Modified(rephr ased) SLO	Understand
[SLO: B-11-Q-14]	List the adaptations in plants to cope with low and high temperatures	Matched SLO	Remember
[SLO: B-11-Q-15]	Describe Explain the turgor pressure and its significance in providing support to herbaceous plants.	Matched SLO	Understand
[SLO: B-11-Q-16]	Describe the structure of supporting tissues in plants.	Matched SLO	Understand
[SLO: B-11-Q-17]	Define growth and explain primary and secondary growth in plants.	Matched SLO	Remember
[SLO: B-11-Q-18]	Justify the formation of annual rings	Modified(rephr ased) SLO	Understand
[SLO: B-11-Q-19]	Explain influence of apical meristem on the growth of lateral shoots.	Matched SLO	Understand
		<u> </u>	 <u> </u>

		[SLO: B-11-Q-20]	outline the role of important plant growth regulators.	Modified(rephr ased) SLO		Understand
		[SLO. B-11-Q-20]	Explain the types of movement in plants	aseu) SLO		
			in response to light, force of gravity,	Matched SLO		Understand
		[SLO: B-11-Q-21]	touch and chemicals.			
		[SLO: B-11-Q-22]	Define photoperiodism.	Matched SLO		Remember
			Classify with examples plants on the			
			basis of photoperiodism and Describe			
			the mechanism of photoperiodism with	Matched SLO		Understand
		[CLO. D. 11 O. 22]	reference to the mode of action of			
		[SLO: B-11-Q-23]	phytochrome.  Explain the role of low temperature			
			treatment on flower production	Matched SLO		Understand
		[SLO: B-11-Q-24]	especially to biennials and perennials.	Matched SEO		Chacistana
		[[020,211 (21]	1			
Students should be understand the essence of	Benchmark 1: Plan the		Decisions relating to measurements and		Not oggogable	
scientific experimentation and carry out the	experiment and clearly	[SLO: B-11-X-01]	observations	New SLO	Not assessable in summative	Understand
necessary steps of understanding the	convey the reasons for the				III Sullillative	
terminology, taking general lab precautions,	experimental technique to	[SLO: B-11-X-02]				
understanding the lab equipment, recording	follow.		Within an investigation, students should			
data and providing suggestions on improving	Benchmark 2: Collect data		be able to:			
the experimental techniques.	and record observations in the form of readings, estimates		• identify the independent variable and dependent variable			
•	and accurate drawings.		decide a suitable range of values to			
	Benchmark 3: Evaluate and		use for the independent variable at			
	interpret the recorded data		which measurements of the			
	and display the calculations		dependent variable are recorded			
	and reasoning.		decide the number of different values			
	Benchmark 4: Analyze the		of the independent variable (a minimum			
	results of the experiment and		of five) and the intervals			
	provide conclusions.		between them	New SLO	Not assessable	Evaluate
	Benchmark 5: Identify		• decide how to change the value of the	New SLO	in summative	Lvaluate
	sources of error and		independent variable			
	suggesting improvements		decide how the dependent variable			
			should be measured • decide the number of replicates at			
			each value			
			decide on appropriate controls for the			
			experiment or investigation			
			decide which variables need to be			
			standardised and how to standardise			
			them. (Variables expected to have			
			a minimal effect, such as variation			
			between test-tubes of the same type, do			

			[SLO: B-11-X-03]	Within an investigation, students should be able to:  • follow instructions to collect results • consider the hazards of the procedure, including the use of any solutions and reagents, and assess the risk as low, medium or high • take readings to obtain accurate data (quantitative results) or observations (qualitative results). When using the light microscope and photomicrographs, Students should be able to: • draw plan diagrams to show the distribution of tissues in a specimen, with no cells drawn and the correct proportions of layers of tissues • draw the observable features of cells in a specimen showing:  – the correct shapes  – the thicknesses of cell walls where applicable (drawn with two lines or drawn with three lines where two cells touch)  – the relative sizes and proportions  – observable cell contents only	New SLO	Not assessable in summative	Understand
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			Recording data and observations			
		[SLO: B-11-X-04]	Within an investigation, students should be able to:  • record raw results (unprocessed) and calculated results (processed) in an appropriate table with:  – descriptive headings, including any required units (no units in body of table)  – heading for the independent variable to the left of (or above, if the table is in rows) the dependent variable  • record quantitative data to the number of decimal places that is appropriate for the measuring instrument used  • record qualitative observations using clear descriptions  • record calculated values (processed results) in an appropriate table.  When using the light microscope and photomicrographs, Students should be able to:  • record the fine details of the specimen, including drawing the detailed shapes of	New SLO	Not assessable in summative	Understand
		[SLO: B-11-X-05]	Display of calculation and reasoning	New SLO	Not assessable in summative	Understand
ills		[SLO: B-11-X-06]	Within an investigation and when using the light microscope and photomicrographs, students should be able to:  • display calculations clearly, showing all the steps and reasoning  • use the correct number of significant figures for calculated quantities. This should be the same as, or one more than, the smallest number of significant figures in the data used in the calculation.  Layout of data and observations	New SLO		

Experimentation Sk	[SLO: B-11-X-07]	Within an investigation, Students should be able to:  • display data as a graph (continuous data), bar chart (discontinuous or categoric) or histogram (frequency data)  • draw a graph, bar chart or histogram clearly and accurately with:  — the independent variable on the x-axis and the dependent variable on the y-axis  — axes labelled to match the relevant table headings, including units where appropriate  — a scale where both axes should use most or all of the grid available and allow the graph to be read easily to within half a square  — all graph points plotted accurately using a sharp pencil, as a small cross or a small dot in a circle, with the intersection of the cross or centre of the dot exactly on the required point  — the plotted points of a graph connected with a clear, sharp and unbroken line, either as a line of best fit, a smooth curve or with ruled straight	Modified(rephr ased) SLO	Not assessable	Understand
	SLO: B-11-X-08]	When using the light microscope and photomicrographs, students should be able to:  • make drawings, using a sharp pencil to give finely drawn lines that are clear and unbroken  • make drawings that use most of the available space and show all the features observed in the specimen, with no shading  • organise comparative observations, showing differences and similarities between specimens.	New SLO	Not assessable	Understand
	[SLO: B-11-X-09]	Interpreting data and observations			Understand

		[SLO: B-11-X-10]	within an investigation, students should be able to:  • calculate an answer with the correct number of significant figures using quantitative results or data provided  • use a graph to find unknown values  • estimate the concentrations of unknown solutions from qualitative results  • identify the contents of unknown solutions using biological molecule tests  • identify anomalous results and suggest how to deal with anomalies  • describe patterns and trends using the data provided in tables and graphs  • evaluate the confidence with which conclusions might be made.	Modified(rephr ased) SLO		Understand
			When using the light microscope and photomicrographs, Students should be able to:  • calculate an answer with the correct number of significant figures using quantitative results or data provided  • compare observable features of specimens of biological material including similarities and differences		Not assessable	
			From results, observations or information provided, students should be able to:  • summarise the main conclusions  • state and explain whether a hypothesis is supported  • make predictions from the patterns and trends in data  • suggest explanations for observations, results, patterns, trends and conclusions.	Modified(rephr ased) SLO	in summative	
		[SLO: B-11-X-11]				

			[SLO: B-11-X-12]	Within an investigation and when using the light microscope and photomicrographs, students should be able to:  • identify systematic or random errors in an investigation, understanding that systematic errors may not affect the trend in results whereas a random error may affect the trend • identify the main sources of error in a particular investigation • suggest improvements to a procedure that will increase the accuracy of the observations or measurements, including:  – using a more effective method to standardise relevant variables  – using a more accurate method of measuring the dependent variable  – using smaller intervals for the values of the independent variable  – collecting replicate measurements so that a mean can be calculated • suggest how to extend the investigation to answer a new question,	New SLO	Not assessable in summative	Understand
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