Subject-group overview

Unit title	Key concept	Related concept(s)	Global context	Statement of inquiry	MYP subject specific objective(s)	ATL skills	Content (topics, knowledge, skills)
Building the Ultimate You	System	Interaction, balance	Scientific and Technical Innovation (analysis of argument)	Systems within organisms interact in order to enable normal functioning and maintain homeostasis using natural and man-made control measures	A -i, ii. iii. D- ii. iii.iv.	Communication: *use a variety of organizers for academic writing tasks * use appropriate forms of writing for different purposes and audiences. * structure information in summaries, essays and reports	LC 1 • I can describe cell specialization within organisms. • I can compare how the structure and function of cells, tissues, organs, and organ systems support life. • I can compare and evaluate various models that represent the interdependence of systems within organisms. • I can discuss the limits of a model. • I can develop and use a model to represent the interdependence of systems within organisms. • I can design and conduct an experiment to provide evidence on how feedback loops affect homeostasis. LC 2 • I can explain the systems involved in maintaining stability in feedback systems. • I can distinguish between positive and negative feedback loops.

You are What You Eat	Change	Energy, Environment, Transformation	Identities and Relationships	The changes in energy and the environment directly impact how we relate to each other and how we transform our surroundings.	A – i, ii B – i C – ii, iii, iv D – ii, iii, iv	Communication * use and interpret a range of discipline-specific terms and symbols *structure information in summaries, essays and reports * give and receive meaningful feedback * make inferences and draw conclusions * use appropriate forms of writing for different purposes and audiences *negotiate ideas and knowledge with peers and teachers. * use a variety of media to communicate with a range of audiences. **Thinking. Critical Thinking Skills)** * draw reasonable conclusions and generalizations * evaluate evidence and arguments *propose and evaluate a variety of solutions.	LC 1 – Photosynthesis •I can identify the inputs and outputs of photosynthesis. •I can explain the transfer of matter and flow of energy between organisms and their environment during photosynthesis. •I can use a model to explain how matter is rearranged during photosynthesis. •I can create a model to illustrate the energy conversion that occurs during photosynthesis. LC 2 – Transformation of Matter •I can identify the inputs and outputs of cellular respiration. •I can relate the process of cellular respiration to body temperature. •I can contrast the amount of energy in the inputs and outputs of cellular respiration. •I can contrast the conditions that contribute to aerobic and anaerobic respiration. •I can explain how muscles get energy from food. •I can use a model to explain how matter is rearranged during cellular respiration. Learning Cycle 3 – Matter on the Move

							• I can show how the atoms in glucose can be rearranged to form other carbon-based molecules. • I can explain how energy is used to form new compounds within organisms. • I can use a model to explain how matter and energy is obtained from food. • I can use evidence from a model or simulation to prove that the carbon, hydrogen and oxygen from glucose can combine with other elements to form different kinds of molecules. • I can create a model to show the molecular structure of carbon-based molecules.
Decoding Your Future	Change	Models, Transformations	Identities and Relationships: physical development; health and well-being	Models can be used to demonstrate change in the physical development of humans.	A – i, ii C – i, ii D – i, ii, iii	**Research. Information literacy** * make connections between various sources of information * collect, record and verify data **thinking. Critical thinking**	LC 1 – The Structure and Function of Cells • I can describe the structure and function of genes, • I can explain the relationship between genes, proteins, and specialized cells. • I can predict how a change in a DNA sequence might affect the formation of proteins. • I can use a model to explain how the sequences of genes contain

						* draw reasonable conclusions and generalizations *: use models and simulations to explore complex systems and issues. **Communication** * use appropriate forms of writing for different purposes and audiences * use and interpret a range of discipline-specific terms and symbols. * read critically and for comprehension	instructions that code for proteins, •I can identify the genetic material of cells. •I can construct an explanation for how the structure of DNA determines the structure of proteins which carry out the essential functions of life. LC 2 – Cell Division and Differentiation •I can explain how two genetically identical daughter cells are produced from one parent cell. •I can compare the inputs and outputs of mitosis.I •I can justify the importance of mitosis in the growth and development of multicellular organisms. •I can use a model to explain how mitosis and cell specialization are important to the life functions of multicellular organisms. •I can develop a model to illustrate how mitosis and cellular differentiation maintain complex organisms. LC 3 – Inheritance and Genetic Variation •I can describe the structure of a chromosome,

							•I can explain how traits are passed •I can explain how traits are passed from parents to offspring. •I can describe the different functions of DNA in cells. •I can explain how meiosis and sexual reproduction lead to genetic variation. •I can explain how errors in DNA replication and environmental factors cause genetic variation. •I can explain how crossing over affects the products of meiosis. •I can explain how cells with the same genetic information are able to produce different proteins. •I can explain the relationship between DNA, proteins and the resulting traits of an organism.
Superbugs	Relationships	Environment, Patterns (interactions)	Identities and Relationships: physical development; health and well-being	Relationships within the environment demonstrate patterns which will affect our health and well-being	A – i, iii C – i, ii D – i, ii, iii	**Communication** *Read critically and for comprehension * use appropriate forms of writing for different purposes and audiences * organize and depict information logically *write for different purposes; *use a variety of organizers for academic writing tasks	LC 1 – Natural Selection • I can identify the relationship between a trait's occurrence and environmental factors. • I can explain how beneficial traits increase an organism's survival. • I can identify the criteria required for natural selection to occur. • I can explain why the frequencies of heritable traits

						Thinking. Critical thinking ***** gather and organize relevant information to formulate an argument ***** draw reasonable conclusions and generalizations. * interpret data Research. Information literacy skills ***** process data and report results	change in a population over time. • I can interpret data to explain the distribution of traits within a population. • I can relate the reproductive success of organisms to the distribution of traits in a population. • I can calculate the distribution of traits within a population. • I can use models to support explanations of how traits are distributed within a specific population. • I can use probability to draw conclusions about the distribution of traits within a population. • I can develop a model that explains how natural selection causes changes in a population. LC 2 – Change Over Time • I can explain how competition for resources and/or genetic variation in a species leads to evolution. • I can explain how differential survival and reproduction of organisms within a species results in evolution. • I can predict, using statistical analysis, changes in trait distribution within a population if the environment changes. • I can use evidence to support the role of natural selection in the evolution of populations.

							• I can use scientific theories and laws to construct explanations about the evolution of populations. • I can use data as evidence to demonstrate that a population is evolving. • I can evaluate the evidence supporting claims that changes in an environment can lead to an increase in the population of a species, emergence of a new species and the extinction of other species. • I can construct an explanation for how evolution is a consequence of: 1) the potential for species to increase in number; 2) the genetic variation of individuals in a species; 3) competition; and 4) natural selection.
It's All Relative	Relation ships	Function, models	Identities and Relationships	Models help people visualize the relationship between the structures and the functions that shape human identity.	A – i, ii D – i, ii, iii	Communication * structure information in summaries, essays and reports * Make inferences and draw conclusions * Read critically and for comprehension *paraphrase accurately and concisely **Thinking. Critical thinking** *Interpret data	LC 1 – Evidence of Evolution • I can identify multiple lines of evidence used to determine common ancestry. • I can infer the evolutionary relationship among organisms based on multiple types of evidence including DNA and amino acid sequences, anatomical and embryological structures, and fossils to suggest common ancestry. • I can explain that evidence for evolutionary relationships is observed at multiple scales (for

						Self-management- Reflective * Consider ethical, cultural and environmental implications	example, spatial, temporal, microscopic, macroscopic). • I can compare DNA and amino acid sequences from multiple species and quantify the differences. • I can communicate conclusions about evolutionary relationships based on multiple lines of evidence in more than one way (for example- graphs, texts, charts). LC 2 – Group Behavior • I can identify factors that influence species' chances to survive and reproduce. • I can identify evidence to support the outcomes of group behavior. • I can describe group behaviors and their benefits on a species. • I can compare group and individual behaviors of organisms. • I can evaluate arguments regarding the outcomes of group behavior on individual and species' chances to survive and reproduce. • I can predict how a population will respond due to limited resources in an ecosystem. • I can develop an argument that justifies the relationship between group behavior and individual survival rates.

Top Predators	Relation ships	Evidence, Patterns	Orientation in space and time (evolution, constraints, and adaptation)	Relationships determined through examination of evidence help us explain adaptations and evolution of species.	A – i, ii, iii B – ii C – i, iii, iv	**Communication** * Use a variety of media to communicate with a range of audiences *: Make inferences and draw conclusions. * read critically and for comprehension *: use appropriate forms of writing for different purposes and audiences *collaborate with peers and experts using a variety of digital environments and media * Read critically and for comprehension *paraphrase accurately and concisely **Thinking. Critical Thinking** *revise understanding based on new evidence and information * evaluate evidence and arguments **Transfer Skills** * Combine knowledge, understanding and skills to create products or solutions **Research. Information literacy skills**	LC 1 – Matter and Energy in the Ecosystem • I can identify sources of carbon within the biosphere, atmosphere, hydrosphere, and geosphere. • I can explain how chemical elements are conserved as they cycle through the biosphere, atmosphere, hydrosphere, and geosphere. • I can account for energy not transferred to the next trophic level of the ecosystem from an organism. • I can design a model to illustrate how carbon is cycled through the biosphere, atmosphere, hydrosphere, and geosphere. • I can use a mathematical representation to support claims of the cycling of matter and flow of energy in an ecosystem. • I can develop a model to show the flow of carbon through global ecosystems. • I can create a model to illustrate the relative proportion of organisms at each trophic level. LC 2 – Populations

						* Create a bibliography according to recognized conventions *understand and implement intellectual property *make connections between various sources of information	• I can explain that ecosystems exist at the same location on a variety of scales. (Ex: plants and animals vs. microbes) • I can identify and explain factors that affect population sizes, species survival, and biodiversity within an ecosystem. • I can describe factors that affect carrying capacity of ecosystems. • I can draw conclusions using mathematical models about how the abundance of one species within an ecosystem affects the abundance of other species within that ecosystem. • I can use mathematical representations (trends, averages, and graphs) to demonstrate how populations change over time. • I can use mathematical representations to identify which factors have the largest effect on the carrying capacity of an ecosystem. • I can use mathematical models to support arguments on how the growth of populations are limited by living and non-living factors within their environments. • I can predict how a population will respond due to limited resources in an ecosystem. LC 3 – Biodiversity

							• I can explain how biodiversity affects stability and resiliency of an ecosystem. • I can recognize that not all disturbances result in a negative change to the environment. • I can list and describe examples of human-caused changes to ecosystems that have resulted in increase, decrease or total extinction of species. • I can predict how ecosystem stability may be altered by an environmental disturbance. • I can compare the impacts of moderate and extreme ecosystem disturbances. • I can evaluate evidence related to the resilience of an ecosystem in response to changes in the biological and physical environment. • I can draw conclusions about how an ecosystem will respond to disturbances based upon its biodiversity. • I can evaluate the argument that when faced with an extreme disturbance, even the most complex, biodiverse ecosystem can be changed enough to create a new ecosystem.
Capstone Project	Systems	Consequences	Globalization and sustainability (the impact of decision-	Consequences to natural systems and the sustainability of individual species are	A – i, ii, iii B – ii C – i, ii D – i, ii, iii, iv	**Communication** * Organize and depict information logically *make inferences and draw conclusions	• I can use evidence to defend the claim that biodiversity leads to ecosystem stability. (R) • I can evaluate the validity and reliability of evidence that the

			making on humankind and the environment)	affected by the choices made by humans.		**Research. Information literacy skills** * Make connections between various sources of information * present information in a variety of formats and platforms **Thinking. Critical Thinking Skills** * gather and organize relevant information to formulate an argument. * evaluate evidence and arguments	resilience of an ecosystem is dependent on the degree of change that occurs in the biological and physical environment. (R) • I can evaluate claims of how biodiversity is affected by changes in environmental conditions. (R) • I can analyze the effects of human activities on an environment. (R) • I can develop or revise a mathematical or computer-based simulation related to the decrease of biodiversity within an ecosystem. (S) • I can use the engineering design process to develop a solution to a problem related to a decrease in biodiversity caused by humans. (P) • I can identify and explain factors and variables that can affect the survival of species within an ecosystem. (K) • I can list and describe examples of human-caused changes to ecosystems that have resulted in increases, decreases or total extinction of species. (K) • I can identify the carrying capacity of a population. (K) • I can use mathematical representations to demonstrate how populations change over time. (S)

							• I can design a solution that reduces the effect of human activities on the environment and biodiversity. (P)

*School can add columns to this template should they wish.