

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

Grade: Grade 11/12
Subject Title: Biology 2*

Quarters: 3rd to 4th Quarter
No. of Hours: 40 hours/10 Weeks per Quarter

Subject Description: This subject is designed to enhance the understanding of the principles and concepts in the study of biology, particularly heredity and variation, and the diversity of living organisms, their structure, function, and evolution.

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE	SCIENCE EQUIPMENT
Organismal Biology	<i>The learners demonstrate an understanding of:</i> 1. Plant and Animal Organ Systems and their Functions	<i>The learners shall be able to:</i> develop a presentation (e.g. role-playing, dramatization and other forms of multimedia) to show how an organism maintains homeostasis through the interaction of the various organ systems in the body	<i>The learners:</i> 1. compare and contrast the following processes in plants and animals: reproduction, development, nutrition, gas exchange, transport/circulation, regulation of body fluids, chemical and nervous control, immune systems, and sensory and motor mechanisms	STEM_BIO11/12-IVa-h-1	1. Model, Human Skeleton 2. Model, Human Torso
	2. Feedback Mechanisms		2. explain how some organisms maintain steady internal conditions that possess various structures and processes	STEM_BIO11/12-IVi-j-2	
			3. describe examples of homeostasis (e.g., temperature regulation, osmotic balance and glucose levels) and the major features of feedback loops that produce such homeostasis	STEM_BIO11/12-IVi-j-3	
Genetics	1. Mendel's Laws of Inheritance 2. Sex Linkage 3. Central Dogma of Molecular Biology 4. Recombinant DNA	1. make a pedigree analysis in the learner's family using a simple genetic trait 2. make a research paper/case study/poster on genetic diseases 3. make a diagram (e.g., pictogram, poster) showing the evolution of a domesticated crop 4. differentiate the 3-Domain Scheme from the 5-Kingdom Scheme of classification of living things	1. predict genotypes and phenotypes of parents and offspring using the laws of inheritance	STEM_BIO11/12-IIIa-b-1	
			2. explain sex linkage and recombination	STEM_BIO11/12-IIIa-b-2	
			3. describe modifications to Mendel's classic ratios (gene interaction)	STEM_BIO11/12-IIIa-b-3	
			4. illustrate the molecular structure of DNA, RNA, and proteins	STEM_BIO11/12-IIIa-b-4	

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			5. diagram the steps in DNA replication and protein synthesis	STEM_BIO11/12-IIIa-b-5	
			6. outline the processes involved in genetic engineering	STEM_BIO11/12-IIIa-b-6	
			7. discuss the applications of recombinant DNA	STEM_BIO11/12-IIIa-b-7	
Evolution and Origin of Biodiversity	Relevance, Mechanisms, Evidence/Bases, and Theories of Evolution		1. describe general features of the history of life on Earth, including generally accepted dates and sequence of the geologic time scale and characteristics of major groups of organisms present during these time periods	STEM_BIO11/12-IIIc-g-8	
			2. explain the mechanisms that produce change in populations from generation to generation (e.g., artificial selection, natural selection, genetic drift, mutation, recombination)	STEM_BIO11/12-IIIc-g-9	
			3. show patterns of descent with modification from common ancestors to produce the organismal diversity observed today	STEM_BIO11/12-IIIc-g-10	
			4. trace the development of evolutionary thought	STEM_BIO11/12-IIIc-g-11	
			5. explain evidences of evolution (e.g., biogeography, fossil record, DNA/protein sequences, homology, and embryology)	STEM_BIO11/12-IIIc-g-12	
			6. infer evolutionary relationships among organisms using the evidence of evolution	STEM_BIO11/12-IIIc-g-13	
Systematics Based on Evolutionary Relationships	Basic Taxonomic Concepts and Principles, Description, Nomenclature, Identification, and Classification		1. explain how the structural and developmental characteristics and relatedness of DNA sequences are used in classifying living things	STEM_BIO11/12IIIh-j-14	
			2. identify the unique/distinctive characteristics of a specific taxon relative to other taxa	STEM_BIO11/12IIIh-j-15	
			3. describe species diversity and cladistics, including the types of evidence and procedures that can be used to establish evolutionary relationships	STEM_BIO11/12IIIh-j-16	

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Code Book Legend

Sample: STEM_BIO11/12IIIh-j-16

LEGEND		SAMPLE	
First Entry	Learning Area and Strand/ Subject or Specialization	Science, Technology, Engineering and Mathematics	STEM_BIO11/12
	Grade Level	Grade 11 or 12	
Uppercase Letter/s	Domain/Content/ Component/ Topic	Biology	
			-
Roman Numeral <i>*Zero if no specific quarter</i>	Quarter	Third Quarter	III
Lowercase Letter/s <i>*Put a hyphen (-) in between letters to indicate more than a specific week</i>	Week	Weeks eight to ten	h-j
			-
Arabic Number	Competency	describe species diversity and cladistics, including the types of evidence and procedures that can be used to establish evolutionary relationships	16

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References:

Alberts, Bruce et. al. *Molecular biology of the cell. (5th ed.)*. New York: Garland Publishing, 2007.

Reece, Jane. B. et. al. *Campbell Biology (9th ed.)*. Boston: Pearson, 2011.