

**PACE ACADEMY  
BIOLOGY 2  
CURRICULUM GUIDE  
S.Y. 2020 - 2021**

Most Essential Learning Competencies	Lessons
<b>ATP - ADP Cycle, Photosynthesis, Respiration:</b> Explain coupled reaction processes and describe the role of ATP in energy coupling and transfer	1.1 Cell and Its Energy  1.2 Specialized Cell Organelles (Mitochondria)  1.3 Cellular Respiration  1.4 Specialized Cell Organelles (Chloroplast)  1.5 Photosynthesis
Explain the importance of chlorophyll and other pigments	
Describe the patterns of electron flow through light reaction events	
Describe the significant events of the Calvin cycle	
Differentiate aerobic from anaerobic respiration	
Explain the major features and sequence the chemical events of cellular respiration	
Distinguish major features of glycolysis, Krebs cycle, electron transport system, and chemiosmosis	
Describe reactions that produce and consume ATP	
<b>Recombinant DNA:</b> Outline the processes involved in genetic engineering	1.6 Revisiting Genetics  1.7 Producing Genetically Modified Organisms
Discuss the applications of recombinant DNA	
<b>Relevance, Mechanisms, Evidence / Bases, and Theories of Evolution:</b> 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	1.8 History of Life on Earth  1.9 The Concept of Evolution  1.10 Changes in Evolutionary Thought Over Time

Explain the mechanisms that produce change in populations from generation to generation (e.g., artificial selection, natural selection, genetic drift, mutation, recombination)	1.11 The Evidence for Evolution
Show patterns of descent with modification from common ancestors to produce the organismal diversity observed today	1.12 Patterns of Natural Selection
Trace the development of evolutionary thought	1.13 How Evolution Works
Explain evidences of evolution (e.g., biogeography, fossil record, DNA/protein sequences, homology, and embryology)	1.14 Pace of Evolution
Infer evolutionary relationships among organisms using the evidence of evolution	
<b>Basic Taxonomic Concepts and Principles, Description, Nomenclature, Identification, and Classification:</b> Explain how the structural and developmental characteristics and relatedness of DNA sequences are used in classifying living things	1.15 Historical View on Life's Classification System
Identify the unique/distinctive characteristics of a specific taxon relative to other taxa	1.16 The Binomial Naming of Organisms
Describe species diversity and cladistics, including the types of evidence and procedures that can be used to establish evolutionary relationships	1.17 The Hierarchy of Taxonomic Classification
	1.18 Systematics: Tracing Life's History
	1.19 Domains of the Living World
	1.20 Microbes and Fungi
	1.21 Plants
	1.22 Animals
<b>Plant and Animal Organ Systems and Their Functions:</b> 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	1.23 Specialized structures in plants and animals
	1.24 Gas Exchange
	1.25 Transport System
	1.26 Defense System
	1.27 Nutrition
<b>Feedback Mechanisms:</b>	1.28 Regulation of Body Fluids

Explain how some organisms maintain steady internal conditions (e.g., temperature regulation, osmotic balance and glucose levels) that possess various structures and processes	1.29 Endocrine and Nervous Systems 1.30 Homeostasis 1.31 Plant Sensory Systems 1.32 Protection and Support 1.33 Bodily Shape and Support for Internal Organs 1.34 Muscular System / Motor Mechanisms 1.35 Reproduction
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### References:

Morales-Ramos, A. C., & Morales, J. D. (2017). *Exploring Life Through Science General Biology 2*. Phoenix Publishing House, Inc.

Seeley, R. R., Stephens, T. D., & Tate, P. (2006). *Essentials of Anatomy & Physiology* (6th ed.). C&E Publishing, Inc.

Urry, L. A., Cain, M. L., Wasserman, S.A., Minorsky, P. V., & Reece, J. B. (2017, 2014, 2011). *Campbell Biology* (11th ed.). Pearson Education, Inc.

**Time Allotment:** Four (4) synchronous sessions (40 minutes per session); Five (5) asynchronous sessions (40 minutes per session)

### Promotion/Retention:

- Assessments will be categorized as the following with the corresponding weight:
  - Short Quizzes (20%)
  - Written Outputs (35%)
  - Product and Performance Tasks (45%)
- Short Quizzes.** These include summative assessments after every lesson, group of related lessons, or chapter.
- Written Outputs.** These include concept maps, data recording and analyses, laboratory reports and documentations, reaction/reflection papers, article reviews, and surveys.
- Product and Performance Tasks.** These include portfolios, investigatory projects, models and diagrams construction, prototype building, research papers, debates, designing and implementation of action plans, designing various models, doing scientific investigations, issue-awareness campaigns, laboratory activity, multimedia presentations, simulation, skills demonstration, and verification experiments.