PACE ACADEMY
BIOLOGY 1
CURRICULUM GUIDE
S.Y. 2020 - 2021

Most Essential Learning Competencies	Lessons
Explain the postulates of the cell theory	1.1 Cell Theory
Describe the structure and function of major and subcellular organelles	1.2 Cell Structure and Functions
Distinguish prokaryotic and eukaryotic cells according to their distinguishing features	1.3 Prokaryotic vs. Eukaryotic Cells
Classify different cell types (of plant/animal tissues) and specify the function(s) of each	1.4 Cell Types
Describe some cell modifications that lead to adaptation to carry out specialized functions (e.g., microvilli, root hair)	1.5 Cell Modifications
Characterize the phases of the cell cycle and their control points	1.6 Cell Cycle (Mitosis & Meiosis)
Describe the stages of mitosis/meiosis given 2n=6	
Explain the significance or applications of mitosis/meiosis	
Identify disorders and diseases that result from the malfunction of the cell during the cell cycle	
Describe the structural components of the cell membrane	1.7 Transport Mechanisms (Simple Diffusion, Facilitated Transport, Active Transport, Bulk / Vesicular Transport)
Relate the structure and composition of the cell membrane to its function	
Explain transport mechanisms in cells (diffusion osmosis, facilitated transport, active transport)	
Differentiate exocytosis and endocytosis	
Describe the components of an enzyme	1.8 Structures and Functions of Biological

Explain oxidation/reduction reactions	Molecules (Carbohydrates, Lipids, Proteins, Enzymes, Nucleic Acids)
Determine how factors such as pH, temperature, and substrate affect enzyme activity	
Explain coupled reaction processes and describe the role of ATP in energy coupling and transfer	1.9 ATP - ADP Cycle
Explain the importance of chlorophyll and other pigments	1.10 Photosynthesis
Describe the patterns of electron flow through light reaction events	
Describe the significant events of the Calvin cycle	
Differentiate aerobic from anaerobic respiration	1.11 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	
Describe the role of oxygen in respiration and describe pathways of electron flow in the absence of oxygen	
Explain the advantages and disadvantages of fermentation and aerobic respiration	

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.