

Photosynthesis and Cellular Respiration Kit for General Biology



Texas Essential Knowledge Standards Alignment

The following table lists the Texas Essential Knowledge Standards that are addressed by the activities included in the Photosynthesis and Cellular Respiration Kit for General Biology. The table also provides details on how the activities align with those elements.

Texas Essential Knowledge Standards	Student Expectations	Photosynthesis and Cellular Respiration Kit for General Biology Alignment Details	Lessons			Post-Lab Questions
			1	2	3	
Biology			✓	✓	✓	✓
C.1 Scientific processes The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices.	The student is expected to: (A) Demonstrate safe practices during laboratory and field investigations. (B) Demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.	Students design and carry out hands-on laboratory experiments using proper safety considerations and protective equipment, and following disposal requirements.	✓	✓	✓	
C.2 Scientific processes The student uses scientific methods and equipment during laboratory and field investigations.	The student is expected to: (E) Plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology. (F) Collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, cameras, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures. (G) Analyze, evaluate, make inferences, and predict trends from data. (H) Communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports.	Students develop investigation questions about how algae beads can be used to measure photosynthesis and cellular respiration. Then, they design their own experiment to collect qualitative or semi-quantitative data. Students create scientific explanations for their experimental questions and make predictions for new scenarios. Students share their explanations and review those from other student groups.	✓	✓	✓	✓

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			1	2	3	
Biology			✓	✓	✓	✓
<p>C.3 Scientific processes</p> <p>The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom.</p>	<p>The student is expected to:</p> <p>(A) In all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student.</p> <p>(E) Evaluate models according to their limitations in representing biological objects or events.</p>	<p>Students draw on their knowledge to design their own experiments using algae beads to collect evidence to answer their questions. Students make claims and provide logical reasoning using evidence gathered from their experiments.</p> <p>In each lesson students create or revise their previous models based on new evidence to illustrate photosynthesis and cellular respiration in algae beads and connections between the processes. Students use their models to make predictions.</p>		✓	✓	
<p>C.9 Scientific concepts</p> <p>The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms.</p>	<p>The student is expected to:</p> <p>(B) Compare the reactants and products of photosynthesis and cellular respiration in terms of energy and matter.</p>	<p>Students explain the color changes of a pH indicator in the presence of algae beads in terms of the basic inputs and outputs of photosynthesis and cellular respiration. Students make connections between these two processes and design experiments using algae beads to further investigate the effects of different conditions.</p>	✓	✓	✓	✓

