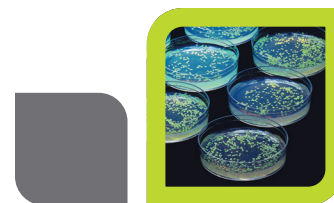


pGLO Bacterial Transformation Kit for General Biology



Texas Essential Knowledge Standards Alignment

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

| Standards | Student Expectations | pGLO Bacterial Transformation Kit for General Biology Alignment Details | Activity | | |
|--|--|--|----------|---|---|
| | | | 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 plan and perform investigations using bacterial transformation to understand gene expression and gene regulation. Students create scientific explanations for their experimental questions. | | | ✓ |

General Biology: Curriculum Alignment

| Standards | Student Expectations | pGLO Bacterial Transformation Kit for General Biology Alignment Details | Activity | | |
|--|--|--|----------|---|---|
| | | | 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) Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the student.</p> <p>(D) Evaluate the impact of scientific research on society and the environment.</p> <p>(E) Evaluate models according to their limitations in representing biological objects or events.</p> | <p>Students draw on their knowledge to design experiments that answer their questions. Students make claims and provide logical reasoning using evidence gathered from their experiments.</p> <p>Students will design and evaluate biosensors that are based on biotechnology.</p> <p>Multiple times throughout the activities, students will create, revise, and use their models to understand and explain gene expression, gene regulation, and the nature of bacterial transformation.</p> | | | ✓ |
| <p>C.6 Scientific concepts</p> <p>The student knows the mechanisms of genetics, such as the role of nucleic acids and the principles of Mendelian and non-Mendelian genetics.</p> | <p>The student is expected to:</p> <p>(B) Recognize that components that make up the genetic code are common to all organisms.</p> <p>(C) Explain the purpose and process of transcription and translation using models of DNA and RNA.</p> <p>(D) Recognize that gene expression is a regulated process.</p> | <p>Students ask questions about the role of the GFP gene in making jellyfish and bacteria fluoresce green.</p> <p>Students will use results from their own experiments to construct an argument about how a gene from jellyfish transferred into bacteria can produce green fluorescent protein.</p> <p>Students will analyze evidence from their experiments to determine cause and effect in gene expression and gene regulation in the pGLO plasmid bacterial transformation system.</p> | | | |