



Unit 5: CTE Alignment Matrix

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Executive Summary

Sponsored by Genentech, Futurelab+ brought together a coalition of partners to develop an innovative, modular, 2-year biotechnology curriculum, along with instructional materials, to expose students and educators to the breadth of education and career pathways across biotechnology. To increase adoption and access to such curricula in California and beyond, the modular curriculum was designed to align with the [California Career Technical Education \(CTE\) Model Curriculum Standards for Biotechnology](#), meet at least 1 year of the [University of California science \(D\) subject requirement](#), and incorporate some of the three-dimensional learning innovations of the [Next Generation Science Standards](#). The 2-year biotechnology curriculum has four core units per year; each core unit has nine lessons and a lab that each take approximately 1 week to complete (9–10 weeks for the full unit). In total, the biotechnology curriculum has 72 lessons and eight labs that span 2 full instructional years. Because the Futurelab+ biotechnology curriculum is modular, teachers can select specific units and materials to design biotechnology courses that are relevant and appropriate for their students and teaching environments.

The purpose of this report is to provide teachers an independent review of which California CTE biotechnology standards are addressed within the curriculum and where they are addressed. The matrices that follow indicate the assignments and/or activities in which students demonstrate their understanding of a particular standard.

This review was completed on materials received May 31, 2022 and has not been updated to reflect any revisions made to materials since then. Only the standards met within Unit 5 are included in the matrices.

Anchor Standards

Standard	Description	Assessed (all student sections)
2.0 Communications: <i>Acquire and accurately use Health Science and Medical Technology sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats. (Direct alignment with LS 9–10, 11–12.6)</i>		
2.1	Recognize the elements of communication using a sender–receiver model.	Lesson 9, Day 1 <i>Design Thinking</i> —capture sheet Lesson 9, Day 2 <i>Design Thinking</i> —capture sheet Lesson 9, Day 3 <i>Design Thinking</i> —capture sheet Lesson 9, Day 4 <i>Designing and Revising Interview Questions</i> —capture sheet
2.2	Identify barriers to accurate and appropriate communication.	Lesson 9, Day 1 <i>Design Thinking</i> —capture sheet Lesson 9, Day 2 <i>Design Thinking</i> —capture sheet Lesson 9, Day 3 <i>Design Thinking</i> —capture sheet Lesson 9, Day 4 <i>Designing and Revising Interview Questions</i> —capture sheet
2.4	Demonstrate elements of written and electronic communication such as accurate spelling, grammar, and format.	Lesson 8, Day 4 <i>Microbes to the Rescue</i> —capture sheet
2.5	Communicate information and ideas effectively to multiple audiences using a variety of media and formats.	Lesson 3, Day 3 <i>Microgrub Poster</i> —checklist <i>Gallery Walk</i> —strategy, assessment at teacher discretion
3.0 Career Planning and Management: <i>Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans. (Direct alignment with SLS 11–12.2)</i>		
3.4	Research the scope of career opportunities available and the requirements for education, training, certification, and licensure.	Lesson 10, Days 4–6 <i>Micro-Con Passport</i> —capture sheet <i>Micro-Con Grading</i> —rubric

Standard	Description	Assessed (all student sections)
<p>4.0 Technology: Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the Health Science and Medical Technology sector workplace environment. (Direct alignment with WS 11–12.6)</p>		
4.1	Use electronic reference materials to gather information and produce products and services.	<p>Lesson 1, Day 2 <i>Microscope Slide</i>—capture sheet <i>Discussion</i>, whole group—strategy, assessment at teacher discretion</p> <p>Lesson 3, Day 1 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 1—capture sheet</p> <p>Lesson 3, Day 2 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 2—capture sheet <i>Toolkit, Microbes and Food (Menu)</i>, questions 1 and 2—capture sheet, assessment at teacher discretion <i>Exit Ticket</i>—strategy, assessment at teacher discretion</p> <p>Lesson 3, Day 3 <i>Microgrub Poster</i>—checklist <i>Toolkit, Microbes and Food (Menu)</i>, visual representation—capture sheet, assessment at teacher discretion</p> <p>Lesson 4, Day 1 <i>Antibiotics Resistance Simulation</i>, Part 2—capture sheet</p> <p>Lesson 4, Day 2 <i>Think-Pair-Share</i>—strategy, assessment at teacher discretion</p> <p>Lesson 4, Day 3 <i>Clinical Trials for a New Phage Therapy</i>, Part 2, question 4—capture sheet <i>Clinical Trials for a New Phage Therapy</i>, Part 3—capture sheet <i>Clinical Trials for a New Phage Therapy</i>, Part 4—capture sheet</p> <p>Lesson 5, Day 1 <i>Bacterial Defense Strategies</i>—capture sheet</p> <p>Lesson 5, Day 2 <i>Restriction Enzymes</i>—capture sheet</p> <p>Lesson 5, Day 4 <i>CRISPR-Cas9 Mechanism</i>—capture sheet</p>

Standard	Description	Assessed (all student sections)
		<p>Lesson 5, Day 5 <i>What Is Sickle Cell Disease</i>—capture sheet <i>Transcribing and Translating the BCL11A Repressor</i>—capture sheet <i>Barriers to CRISPR-Cas9 Therapies</i>—capture sheet</p> <p>Lesson 6, Day 3 <i>Bioethical Decision-Making</i>, questions 5 and 6—capture sheet</p> <p>Lesson 8, Day 1 <i>CO₂ Data Extrapolation</i>—capture sheet</p> <p>Lesson 8, Day 2 <i>Climate Change Simulation</i>—capture sheet</p> <p>Lesson 8, Day 3 <i>Greenhouse Gas Emissions from Large Facilities</i>—capture sheet</p> <p>Lesson 8, Day 4 <i>Microbes to the Rescue</i>—capture sheet</p> <p>Lesson 9, Day 3 <i>Micro-Con Challenge Topic Research</i>—capture sheet</p> <p>Lesson 9, Day 4 <i>Designing and Revising Interview Questions</i>—capture sheet</p> <p>Lesson 10, Day 1 <i>Micro-Con Project Tuning</i>—capture sheet</p> <p>Lesson 10, Day 2 <i>Micro-Con Project Tuning</i>—capture sheet <i>Elevator Pitch</i>—capture sheet</p> <p>Lesson 10, Days 4–6 <i>Micro-Con Grading</i>—rubric</p>
4.3	Use information and communication technologies to synthesize, summarize, compare, and contrast information from multiple sources.	<p>Lesson 1, Day 1 <i>Discussion</i>, whole group—strategy, assessment at teacher discretion <i>Concept Map</i>—assessment at teacher discretion</p> <p>Lesson 1, Day 2 <i>Microscope Slide</i>—capture sheet <i>Discussion</i>, whole group—strategy, assessment at teacher discretion</p> <p>Lesson 1, Day 3 <i>Superhero/Anime/Fantasy Creature Analogy</i>—capture sheet</p> <p>Lesson 1, Day 4 <i>Superhero Microbe Storyboard</i>—capture sheet</p>

Standard	Description	Assessed (all student sections)
		<p>Lesson 1, Day 5 <i>Superhero Microbe Comic</i>—rubric</p> <p>Lesson 3, Day 1 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 1—capture sheet</p> <p>Lesson 3, Day 2 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 2—capture sheet <i>Toolkit, Microbes and Food (Menu)</i>, questions 1 and 2—capture sheet, assessment at teacher discretion <i>Exit Ticket</i>—strategy, assessment at teacher discretion</p> <p>Lesson 3, Day 3 <i>Microgrub Poster</i>—checklist <i>Toolkit, Microbes and Food (Menu)</i>, visual representation—capture sheet, assessment at teacher discretion</p> <p>Lesson 4, Day 1 <i>Antibiotics Resistance Simulation</i>, Part 2—capture sheet <i>Antibiotics Resistance Simulation</i>, Part 3—capture sheet</p> <p>Lesson 4, Day 3 <i>Clinical Trials for a New Phage Therapy</i>, Part 2, question 4—capture sheet <i>Clinical Trials for a New Phage Therapy</i>, Part 3—capture sheet <i>Clinical Trials for a New Phage Therapy</i>, Part 4—capture sheet</p> <p>Lesson 5, Day 1 <i>Bacterial Defense Strategies</i>—capture sheet</p> <p>Lesson 5, Day 2 <i>Restriction Enzymes</i>—capture sheet</p> <p>Lesson 5, Day 4 <i>CRISPR-Cas9 Mechanism</i>—capture sheet</p> <p>Lesson 5, Day 5 <i>What is Sickle Cell Disease</i>—capture sheet <i>Barriers to CRISPR-Cas9 Therapies</i>—capture sheet</p> <p>Lesson 8, Day 1 <i>CO₂ Data Extrapolation</i>—capture sheet</p> <p>Lesson 8, Day 3 <i>Greenhouse Gas Emissions from Large Facilities</i>—capture sheet</p>

Standard	Description	Assessed (all student sections)
		<p>Lesson 8, Day 4 <i>Microbes to the Rescue</i>—capture sheet</p> <p>Lesson 9, Day 3 <i>Micro-Con Challenge Topic Research</i>—capture sheet</p> <p>Lesson 9, Day 4 <i>Designing and Revising Interview Questions</i>—capture sheet</p> <p>Lesson 10, Day 1 <i>Micro-Con Project Tuning</i>—capture sheet</p> <p>Lesson 10, Day 2 <i>Micro-Con Project Tuning</i>—capture sheet <i>Elevator Pitch</i>—capture sheet</p> <p>Lesson 10, Days 4–6 <i>Micro-Con Grading</i>—rubric</p>
4.5	Research past, present, and projected technological advances as they impact a particular pathway.	<p>Lesson 3, Day 1 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 1—capture sheet</p> <p>Lesson 3, Day 2 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 2 — capture sheet <i>Toolkit, Microbes and Food (Menu)</i>, questions 1 and 2—capture sheet, assessment at teacher discretion <i>Exit Ticket</i>—strategy, assessment at teacher discretion</p> <p>Lesson 3, Day 3 <i>Microgrub Poster</i>—checklist <i>Toolkit, Microbes and Food (Menu)</i>, visual representation—capture sheet, assessment at teacher discretion</p> <p>Lesson 5, Day 1 <i>Bacterial Defense Strategies</i>—capture sheet</p> <p>Lesson 5, Day 2 <i>Restriction Enzymes</i>—capture sheet</p> <p>Lesson 5, Day 4 <i>CRISPR-Cas9 Mechanism</i>—capture sheet <i>Barriers to CRISPR-Cas9 Therapies</i>—capture sheet</p> <p>Lesson 5, Day 6 <i>Toolkit, Bacterial Defense</i>, questions 5–7—capture sheet, assessment at teacher discretion <i>Microbe Phage Scenarios</i>—student group presentations</p>

Standard	Description	Assessed (all student sections)
		<p>Lesson 8, Day 1 <i>CO₂ Data Extrapolation</i>—capture sheet</p> <p>Lesson 8, Day 1 (optional) <i>Extension Activity</i>—discussion, assessment at teacher discretion</p> <p>Lesson 8, Day 2 <i>Climate Change Simulation</i>—capture sheet</p> <p>Lesson 8, Day 3 <i>Greenhouse Gas Emissions from Large Facilities</i>—capture sheet</p> <p>Lesson 8, Day 4 <i>Microbes to the Rescue</i>—capture sheet</p>
<p>5.0 Responsibility and Flexibility: <i>Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Health Science and Medical Technology sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques. (Direct alignment with WS 11–12.7)</i></p>		
5.1	Identify and ask significant questions that clarify various points of view to solve problems.	<p>Lesson 9, Day 1 <i>Design Thinking</i>—capture sheet</p> <p>Lesson 9, Day 2 <i>Design Thinking</i>—capture sheet</p> <p>Lesson 9, Day 3 <i>Design Thinking</i>—capture sheet <i>Micro-Con Challenge Topic Research</i>—capture sheet</p> <p>Lesson 9, Day 4 <i>Designing and Revising Interview Questions</i>—capture sheet</p> <p>Lesson 10, Day 1 <i>Micro-Con Project Tuning</i>—capture sheet</p> <p>Lesson 10, Day 2 <i>Micro-Con Project Tuning</i>—capture sheet <i>Elevator Pitch</i>—capture sheet</p> <p>Lesson 10, Day 3 <i>Micro-Con Project Tuning</i>—capture sheet</p> <p>Lesson 10, Days 4–6 <i>Micro-Con Grading</i>—rubric</p>
5.3	Use systems thinking to analyze how various components interact with each other to produce outcomes in a complex work environment.	<p>Lesson 4, Day 1 <i>Antibiotics Resistance Simulation, Part 2</i>—capture sheet <i>Antibiotics Resistance Simulation, Part 3</i>—capture sheet</p> <p>Lesson 4, Day 2 <i>When a Virus Is the Cure</i>—capture sheet</p>

Standard	Description	Assessed (all student sections)
5.6	Read, interpret, and extract information from documents.	<p>Lesson 1, Day 1 <i>Discussion</i>, whole group—strategy, assessment at teacher discretion <i>Concept Map</i>—assessment at teacher discretion</p> <p>Lesson 1, Day 3 <i>Superhero/Anime/Fantasy Creature Analogy</i>—capture sheet</p> <p>Lesson 1, Day 4 <i>Superhero Microbe Storyboard</i>—capture sheet</p> <p>Lesson 1, Day 5 <i>Superhero Microbe Comic</i>—rubric <i>Toolkit, Superhero Microbes</i>, questions 4 and 5—capture sheet, assessment at teacher discretion</p> <p>Lesson 3, Day 1 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 1—capture sheet</p> <p>Lesson 3, Day 2 <i>Synthetic Biology Article</i>—capture sheet <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 2 — capture sheet <i>Toolkit, Microbes and Food (Menu)</i>, questions 1 and 2—capture sheet, assessment at teacher discretion <i>Exit Ticket</i>—strategy, assessment at teacher discretion</p> <p>Lesson 3, Day 3 <i>Microgrub Poster</i>—checklist <i>Toolkit, Microbes and Food (Menu)</i>, questions 3 and 4, visual representation—capture sheet, assessment at teacher discretion</p> <p>Lesson 4, Day 1 <i>Antibiotics Resistance Simulation</i>, Part 2—capture sheet</p> <p>Lesson 4, Day 2 <i>When a Virus Is the Cure</i>—capture sheet</p> <p>Lesson 4, Day 3 <i>Clinical Trials for a New Phage Therapy</i>, Part 2, question 4—capture sheet <i>Clinical Trials for a New Phage Therapy</i>, Part 3—capture sheet <i>Clinical Trials for a New Phage Therapy</i>, Part 4—capture sheet</p>

Standard	Description	Assessed (all student sections)
		<p>Lesson 5, Day 1 <i>Bacterial Defense Strategies</i>—capture sheet</p> <p>Lesson 5, Day 2 <i>Restriction Enzymes</i>—capture sheet</p> <p>Lesson 5, Day 3 <i>History of CRISPR-Cas9</i>—capture sheet</p> <p>Lesson 5, Day 4 <i>CRISPR-Cas9 Mechanism</i>—capture sheet</p> <p>Lesson 5, Day 5 <i>What Is Sickle Cell Disease</i>—capture sheet <i>Barriers to CRISPR-Cas9 Therapies</i>—capture sheet</p> <p>Lesson 5, Day 6 <i>Toolkit, Bacterial Defense</i>, questions 5–7—capture sheet, assessment at teacher discretion <i>Microbe Phage Scenarios</i>—student group presentations</p> <p>Lesson 6, Day 1 <i>Decision-Making Framework</i>—capture sheet</p> <p>Lesson 6, Day 2 <i>Bioethical Decision-Making</i>, questions 1–4—capture sheet</p> <p>Lesson 6, Day 3 <i>Bioethical Decision-Making</i>, questions 5 and 6—capture sheet</p> <p>Lesson 8, Day 3 <i>Greenhouse Gas Emissions from Large Facilities</i>—capture sheet</p> <p>Lesson 8, Day 4 <i>Microbes to the Rescue</i>—capture sheet</p> <p>Lesson 9, Day 3 <i>Micro-Con Challenge Topic Research</i>—capture sheet</p> <p>Lesson 9, Day 4 <i>Designing and Revising Interview Questions</i>—capture sheet</p> <p>Lesson 10, Day 1 <i>Micro-Con Project Tuning</i>—capture sheet</p> <p>Lesson 10, Day 2 <i>Micro-Con Project Tuning</i>—capture sheet <i>Elevator Pitch</i>—capture sheet</p> <p>Lesson 10, Days 4–6 <i>Micro-Con Grading</i>—rubric</p>

Standard	Description	Assessed (all student sections)
<p>7.0 Responsibility and Flexibility: <i>Initiate and participate in a range of collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the Health Science and Medical Technology sector workplace environment and community settings. (Direct alignment with SLS 9–10, 11–12.1)</i></p>		
7.4	Practice time management and efficiency to fulfill responsibilities.	<p>Lesson 1, Day 3 <i>Superhero/Anime/Fantasy Creature Analogy</i>—capture sheet</p> <p>Lesson 6, Day 3 <i>Bioethical Decision-Making</i>, questions 5 and 6—capture sheet</p> <p>Lesson 9, Day 2 <i>Design Thinking</i>—capture sheet</p> <p>Lesson 10, Day 3 <i>Micro-Con Project Tuning</i>—capture sheet</p> <p>Lesson 10, Days 4–6 <i>Micro-Con Passport</i>—capture sheet <i>Micro-Con Grading</i>—rubric</p>
7.6	Demonstrate knowledge and practice of responsible financial management.	<p>Lesson 3, Day 1 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 1—capture sheet</p>
7.7	Demonstrate the qualities and behaviors that constitute a positive and professional work demeanor, including appropriate attire for the profession.	<p>Lesson 10, Days 4–6 <i>Micro-Con Passport</i>—capture sheet <i>Micro-Con Grading</i>—rubric</p>
7.8	Explore issues of global significance and document the impact on the Health Science and Medical Technology sector.	<p>Lesson 5, Day 1 <i>Bacterial Defense Strategies</i>—capture sheet</p> <p>Lesson 5, Day 2 <i>Restriction Enzymes</i>—capture sheet</p> <p>Lesson 5, Day 3 <i>History of CRISPR-Cas9</i>—capture sheet</p> <p>Lesson 5, Day 5 <i>What Is Sickle Cell Disease</i>—capture sheet <i>Barriers to CRISPR-Cas9 Therapies</i>—capture sheet</p> <p>Lesson 5, Day 6 <i>Toolkit, Bacterial Defense</i>, questions 5–7—capture sheet, assessment at teacher discretion <i>Microbe Phage Scenarios</i>—student group presentations</p>

Standard	Description	Assessed (all student sections)
		<p>Lesson 8, Day 1 <i>Think-Pair-Share</i>—strategy, assessment at teacher discretion</p> <p>Lesson 8, Day 1 (optional) <i>Extension Activity</i>—discussion, assessment at teacher discretion</p> <p>Lesson 8, Day 3 <i>Greenhouse Gas Emissions from Large Facilities</i>—capture sheet</p> <p>Lesson 8, Day 4 <i>Microbes to the Rescue</i>—capture sheet <i>Discussion</i>, whole group—strategy, assessment at teacher discretion <i>Microbes to the Rescue</i>—capture sheet <i>Toolkit, Microbes and Balance in the Environment</i>—capture sheet, assessment at teacher discretion</p> <p>Lesson 9, Day 3 <i>Micro-Con Challenge Topic Research</i>—capture sheet <i>Toolkit, Design Thinking to Identify Challenges</i>—capture sheet, assessment at teacher discretion</p> <p>Lesson 9, Day 4 <i>Designing and Revising Interview Questions</i>—capture sheet</p> <p>Lesson 10, Day 1 <i>Micro-Con Project Tuning</i>—capture sheet</p> <p>Lesson 10, Day 2 <i>Micro-Con Project Tuning</i>—capture sheet <i>Elevator Pitch</i>—capture sheet</p> <p>Lesson 10, Days 4–6 <i>Micro-Con Passport</i>—capture sheet <i>Micro-Con Grading</i>—rubric</p>
<p>9.0 Leadership and Teamwork: <i>Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision-making, benefits of workforce diversity, and conflict resolution as practiced in the Cal-HOSA career technical student organization. (Direct alignment with SLS 11-12.1b)</i></p>		
9.3	Understand the characteristics and benefits of teamwork, leadership, and citizenship in the school, community, and workplace setting.	<p>Lesson 3, Day 1 <i>Discussion</i>, small group—strategy, assessment at teacher discretion</p> <p>Lesson 3, Day 2 <i>Synthetic Biology Article</i>—capture sheet</p> <p>Lesson 3, Day 3 <i>Toolkit, Microbes and Food (Menu)</i>, visual representation—capture sheet, assessment at teacher discretion</p>

Standard	Description	Assessed (all student sections)
9.5	Understand that the modern world is an international community and requires an expanded global view.	<p>Lesson 3, Day 1 <i>Discussion</i>, small group—strategy, assessment at teacher discretion</p> <p>Lesson 3, Day 2 <i>Synthetic Biology Article</i>—capture sheet <i>Toolkit, Microbes and Food (Menu)</i>, questions 1 and 2—capture sheet, assessment at teacher discretion</p> <p>Lesson 3, Day 3 <i>Toolkit, Microbes and Food (Menu)</i>, visual representation—capture sheet, assessment at teacher discretion</p> <p>Lesson 5, Day 3 <i>History of CRISPR-Cas9</i>—capture sheet</p> <p>Lesson 5, Day 5 <i>What Is Sickle Cell Disease</i>—capture sheet <i>Barriers to CRISPR-Cas9 Therapies</i>—capture sheet</p> <p>Lesson 5, Day 6 <i>Toolkit, Bacterial Defense</i>, questions 5–7—capture sheet, assessment at teacher discretion <i>Microbe Phage Scenarios</i>—student group presentations</p> <p>Lesson 10, Day 1 <i>Micro-Con Project Tuning</i>—capture sheet</p> <p>Lesson 10, Day 2 <i>Micro-Con Project Tuning</i>—capture sheet <i>Elevator Pitch</i>—capture sheet</p> <p>Lesson 10, Days 4–6 <i>Micro-Con Passport</i>—capture sheet <i>Micro-Con Grading</i>—rubric</p>
9.7	Participate in interactive teamwork to solve real Health Science and Medical Technology sector issues and problems.	<p>Lesson 10, Day 1 <i>Micro-Con Project Tuning</i>—capture sheet</p> <p>Lesson 10, Day 2 <i>Micro-Con Project Tuning</i>—capture sheet <i>Elevator Pitch</i>—capture sheet</p> <p>Lesson 10, Day 3 <i>Micro-Con Project Tuning</i>—capture sheet</p> <p>Lesson 10, Days 4–6 <i>Micro-Con Passport</i>—capture sheet <i>Micro-Con Grading</i>—rubric</p>

Standard	Description	Assessed (all student sections)
10.0 Technical Knowledge and Skills: <i>Apply essential technical knowledge and skills common to all pathways in the Health Science and Medical Technology sector, following procedures when carrying out experiments or performing technical tasks. (Direct alignment with WS 11-12.6)</i>		
10.1	Interpret and explain terminology and practices specific to the Health Science and Medical Technology sector.	<p>Lesson 4, Day 1 <i>Antibiotics Resistance Simulation, Part 1</i>—capture sheet <i>Antibiotics Resistance Simulation, Part 3</i>—capture sheet</p> <p>Lesson 4, Day 2 <i>Think-Pair-Share</i>—strategy, assessment at teacher discretion <i>When a Virus Is the Cure</i>—capture sheet</p> <p>Lesson 4, Day 3 <i>Clinical Trials for a New Phage Therapy, Part 2, question 4</i>—capture sheet <i>Clinical Trials for a New Phage Therapy, Part 3</i>—capture sheet</p>

Pathway Standards

Standard	Description	Assessed
A1.0: <i>Define and assess biotechnology and recognize the diverse applications and impact on society.</i>		
A1.1	Use data to explain how biotechnology fields such as pharmaceuticals, agriculture, diagnostics, industrial products, instrumentation, and research and development are impacting human life.	<p>Lesson 3, Day 1 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker, question 1</i>—capture sheet <i>Discussion</i>, small group—strategy, assessment at teacher discretion</p> <p>Lesson 3, Day 2 <i>Synthetic Biology Article</i>—capture sheet <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker, question 2</i>—capture sheet <i>Toolkit, Microbes and Food (Menu)</i>, questions 1 and 2—capture sheet, assessment at teacher discretion</p> <p>Lesson 3, Day 3 <i>Toolkit, Microbes and Food (Menu)</i>, questions 3 and 4, visual representation—capture sheet, assessment at teacher discretion</p> <p>Lesson 5, Day 2 <i>Restriction Enzymes</i>—capture sheet</p> <p>Lesson 5, Day 3 <i>History of CRISPR-Cas9</i>—capture sheet</p>

Standard	Description	Assessed
		<p>Lesson 5, Day 5 <i>What Is Sickle Cell Disease</i>—capture sheet <i>Barriers to CRISPR-Cas9 Therapies</i>—capture sheet</p> <p>Lesson 5, Day 6 <i>Toolkit, Bacterial Defense</i>, questions 5–7—capture sheet, assessment at teacher discretion <i>Microbe Phage Scenarios</i>—student group presentations</p>
A1.3	Recognize the role of innovation in creation of emerging biotechnology careers, including those in nanotechnology, biofuels, and forensics.	<p>Lesson 3, Day 1 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 1—capture sheet</p> <p>Lesson 3, Day 2 <i>Synthetic Biology Article</i>—capture sheet <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 2 — capture sheet</p> <p>Lesson 3, Day 3 <i>Toolkit, Microbes and Food (Menu)</i>, questions 3 and 4, visual representation—capture sheet, assessment at teacher discretion</p> <p>Lesson 5, Day 3 <i>History of CRISPR-Cas9</i>—capture sheet</p> <p>Lesson 5, Day 4 <i>Discussion</i>, whole group—strategy, assessment at teacher discretion</p> <p>Lesson 5, Day 6 <i>Toolkit, Bacterial Defense</i>, questions 5–7—capture sheet, assessment at teacher discretion <i>Microbe Phage Scenarios</i>—student group presentations</p> <p>Lesson 8, Day 3 <i>Greenhouse Gas Emissions from Large Facilities</i>—capture sheet</p> <p>Lesson 8, Day 4 <i>Microbes to the Rescue</i>—capture sheet <i>Toolkit, Microbes and Balance in the Environment</i>—capture sheet, assessment at teacher discretion</p> <p>Lesson 9, Day 1 <i>Design Thinking</i>—capture sheet</p> <p>Lesson 9, Day 3 <i>Toolkit, Design Thinking to Identify Challenges</i>—capture sheet, assessment at teacher discretion</p>

Standard	Description	Assessed
A1.5	Evaluate the impact of biotechnological applications on both developing and industrial societies, including legal and judicial practices.	<p>Lesson 9, Day 3 <i>Toolkit, Design Thinking to Identify Challenges</i>—capture sheet, assessment at teacher discretion</p> <p>Lesson 9, Day 4 <i>Designing and Revising Interview Questions</i>—capture sheet</p>
A1.6	Explore and outline the various science and nonscience fields and careers associated with biotechnology.	<p>Lesson 3, Day 1 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 1—capture sheet</p> <p>Lesson 3, Day 2 <i>Synthetic Biology Article</i>—capture sheet <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 2 —capture sheet</p> <p>Lesson 3, Day 3 <i>Toolkit, Microbes and Food (Menu)</i>, questions 3 and 4, visual representation—capture sheet, assessment at teacher discretion</p> <p>Lesson 5, Day 3 <i>History of CRISPR-Cas9</i>—capture sheet</p> <p>Lesson 5, Day 4 <i>Discussion</i>, whole group—strategy, assessment at teacher discretion</p> <p>Lesson 5, Day 6 <i>Toolkit, Bacterial Defense</i>, questions 5–7—capture sheet, assessment at teacher discretion <i>Microbe Phage Scenarios</i>—student group presentations</p>
<p>A2.0: Understand the ethical, moral, legal, and cultural issues related to the use of biotechnology research and product development.</p>		
A2.1	Know the relationship between morality and ethics in the development of biotechnology health care products.	<p>Lesson 6, Day 1 <i>Decision-Making Framework</i>—capture sheet <i>Ethical Case Study</i>—capture sheet <i>Discussion</i>, whole group—strategy, assessment at teacher discretion</p> <p>Lesson 6, Day 2 <i>Bioethical Decision-Making</i>, questions 1–4—capture sheet</p> <p>Lesson 6, Day 3 <i>Bioethical Decision-Making</i>, questions 5 and 6—capture sheet <i>Toolkit, The Use of CRISPR and Bioethical Decision-Making</i>, questions 1–3—capture sheet, assessment at teacher discretion</p>

Standard	Description	Assessed
A2.2	Know the difference between personal, professional, and organizational ethics.	<p>Lesson 6, Day 1 <i>Decision-Making Framework</i>—capture sheet <i>Ethical Case Study</i>—capture sheet <i>Discussion</i>, whole group—strategy, assessment at teacher discretion</p> <p>Lesson 6, Day 2 <i>Bioethical Decision-Making</i>, questions 1–4—capture sheet</p> <p>Lesson 6, Day 3 <i>Bioethical Decision-Making</i>, questions 5 and 6—capture sheet <i>Toolkit, The Use of CRISPR and Bioethical Decision-Making</i>, questions 1–3—capture sheet, assessment at teacher discretion</p>
A2.4	Understand the critical need for ethical policies and procedures for institutions engaged in biotechnology research and product development.	<p>Lesson 4, Day 1 <i>Think-Pair-Share</i>—strategy, assessment at teacher discretion <i>Antibiotics Resistance Simulation</i>, Part 1—capture sheet <i>Antibiotics Resistance Simulation</i>, Part 3—capture sheet</p> <p>Lesson 4, Day 2 <i>Think-Pair-Share</i>—strategy, assessment at teacher discretion <i>When a Virus Is the Cure</i>—capture sheet</p> <p>Lesson 4, Day 3 <i>Discussion</i>, whole group—strategy, assessment at teacher discretion <i>Clinical Trials for a New Phage Therapy</i>, Part 2, questions 1–3—capture sheet <i>Clinical Trials for a New Phage Therapy</i>, Part 3—capture sheet</p> <p>Lesson 4, Day 3 <i>Clinical Trials for a New Phage Therapy</i>, Part 4—capture sheet <i>Toolkit, Antibiotics, Resistance, and Combating Disease</i>—capture sheet, assessment at teacher discretion</p> <p>Lesson 6, Day 1 <i>Decision-Making Framework</i>—capture sheet <i>Ethical Case Study</i>—capture sheet <i>Discussion</i>, whole group—strategy, assessment at teacher discretion</p> <p>Lesson 6, Day 2 <i>Bioethical Decision-Making</i>, questions 1–4—capture sheet</p>

Standard	Description	Assessed
		<p>Lesson 6, Day 3 <i>Bioethical Decision-Making</i>, questions 5 and 6—capture sheet <i>Toolkit, The Use of CRISPR and Bioethical Decision-Making</i>, questions 1–3—capture sheet, assessment at teacher discretion</p>
<p>A3.0: <i>Demonstrate competencies in the fundamentals of molecular cell biology, including deoxyribonucleic acid (DNA) and proteins and standard techniques for their purification and manipulation.</i></p>		
A3.3	Employ standard techniques of DNA extraction, purification, restriction digests, bacterial cell culture, and agarose gel electrophoresis and document and evaluate results.	<p>Lesson 2, Day 1 <i>Background Reading: Fermentation</i>—capture sheet <i>Student Guide, Part 1: Pre-Lab</i>, question 2—capture sheet <i>Vocabulary Tool</i> <i>Exit Ticket</i>—strategy, assessment at teacher discretion</p> <p>Lesson 2, Day 2 <i>Background Reading: Effects of Variables on Yogurt Production</i>, jigsaw—capture sheet <i>Student Guide, Part 1: Pre-Lab</i> <i>Toolkit, Yogurt Fermentation</i>, question 1—capture sheet, assessment at teacher discretion</p> <p>Lesson 2, Day 3 <i>Student Guide, Part 2: Lab</i>—capture sheet <i>The Microbiome</i>, jigsaw—capture sheet</p> <p>Lesson 2, Day 4 <i>Student Guide, Part 2: Lab</i>—capture sheet <i>Interview with a Scientist</i>—capture sheet</p> <p>Lesson 2, Day 5 <i>Student Guide, Part 2: Lab</i>—capture sheet <i>Student Guide, Part 3: Data Analysis</i>, questions 3 and 4—capture sheet <i>Gallery Walk</i>—strategy, assessment at teacher discretion <i>Think-Pair-Share</i>—strategy, assessment at teacher discretion <i>Student Guide, Part 4: Answer the Driving Question</i>—capture sheet</p> <p>Lesson 5, Day 1 <i>Bacterial Defense Strategies</i>—capture sheet <i>Toolkit, Bacterial Defense</i>, question 1—capture sheet, assessment at teacher discretion</p>

Standard	Description	Assessed
		<p>Lesson 5, Day 2 <i>Restriction Enzymes</i>—capture sheet <i>Toolkit, Bacterial Defense</i>, question 3—strategy, assessment at teacher discretion</p> <p>Lesson 5, Day 3 <i>History of CRISPR-Cas9</i>—capture sheet <i>Toolkit, Bacterial Defense</i> question 1—strategy, assessment at teacher discretion</p> <p>Lesson 5, Day 4 <i>CRISPR-Cas9 Mechanism</i>—capture sheet <i>Toolkit, Bacterial Defense</i>, question 2—strategy, assessment at teacher discretion</p> <p>Lesson 5, Day 5 <i>Transcribing and Translating the BCL11A Repressor</i>—capture sheet</p> <p>Lesson 5, Day 6 <i>Toolkit, Bacterial Defense</i>, questions 5–7—capture sheet, assessment at teacher discretion <i>Microbe Phage Scenarios</i>—student group presentations</p> <p>Lesson 7, Day 2 <i>Student Protocol, Part 1: Insect DNA Extraction and PCR</i>, steps 1–18—capture sheet <i>Exit Ticket</i>—strategy, assessment at teacher discretion <i>Vocabulary Tool</i></p> <p>Lesson 7, Day 3 <i>Student Protocol, Part 1: Insect DNA Extraction and PCR</i>, steps 19–30—capture sheet <i>Background Reading: What Is Polymerase Chain Reaction (PCR)?</i>—capture sheet <i>Exit Ticket</i>—strategy, assessment at teacher discretion</p> <p>Lesson 7, Day 4 <i>Student Protocol, Part 2: Gel Electrophoresis</i>—capture sheet <i>Background Reading: Analyzing Wolbachia PCR Results</i>—capture sheet <i>Student Guide, Part 2: Lab</i>—capture sheet <i>Student Guide, Part 3: Data Analysis</i>, question 1—capture sheet</p> <p>Lesson 7, Day 5 <i>Student Guide, Part 3: Data Analysis</i>, questions 2–4—capture sheet</p>

Standard	Description	Assessed
A3.5	Predict outcomes of DNA and protein separation protocols.	<p>Lesson 5, Day 2 <i>Restriction Enzymes</i>—capture sheet <i>Toolkit, Bacterial Defense</i>, question 3—strategy, assessment at teacher discretion</p> <p>Lesson 5, Day 3 <i>History of CRISPR-Cas9</i>—capture sheet <i>Toolkit, Bacterial Defense</i>, question 1—strategy, assessment at teacher discretion</p> <p>Lesson 5, Day 4 <i>CRISPR-Cas9 Mechanism</i>—capture sheet <i>Toolkit, Bacterial Defense</i>, question 2—strategy, assessment at teacher discretion</p> <p>Lesson 5, Day 5 <i>Transcribing and Translating the BCL11A Repressor</i>—capture sheet <i>CRISPR-Cas9 Mode</i>—capture sheet</p> <p>Lesson 5, Day 6 <i>Toolkit, Bacterial Defense</i>, questions 5–7—capture sheet, assessment at teacher discretion <i>Microbe Phage Scenarios</i>—student group presentations</p> <p>Lesson 7, Day 2 <i>Student Protocol, Part 1: Insect DNA Extraction and PCR</i>, steps 1–18—capture sheet</p> <p>Lesson 7, Day 3 <i>Student Protocol, Part 1: Insect DNA Extraction and PCR</i>, steps 19–30—capture sheet</p> <p>Lesson 7, Day 4 <i>Student Protocol, Part 2: Gel Electrophoresis</i>—capture sheet <i>Background Reading: Analyzing Wolbachia PCR Results</i>—capture sheet <i>Student Guide, Part 2: Lab</i>—capture sheet <i>Student Guide, Part 3: Data Analysis</i>, question 1—capture sheet</p> <p>Lesson 7, Day 5 <i>Student Guide, Part 3: Data Analysis</i>, questions 2–4—capture sheet</p>

Standard	Description	Assessed
A4.0: Recognize basic concepts in cell biology and become familiar with the laboratory tools used for their analysis.		
A4.1	List and describe the structure and function of cellular organelles.	<p>Lesson 1, Day 1 <i>Discussion</i>, small group—strategy, assessment at teacher discretion <i>Concept Map</i>—assessment at teacher discretion</p> <p>Lesson 1, Day 2 <i>Microscope Slide</i>—capture sheet <i>Discussion</i>, whole group—strategy, assessment at teacher discretion</p> <p>Lesson 1, Day 3 <i>Superhero/Anime/Fantasy Creature Analogy</i>—capture sheet</p> <p>Lesson 1, Day 4 <i>Superhero Microbe Storyboard</i>—capture sheet</p> <p>Lesson 1, Day 5 <i>Superhero Microbe Comic</i>—rubric <i>Discussion</i>, whole group—strategy, assessment at teacher discretion <i>Toolkit, Superhero Microbes</i>, questions 1–3—capture sheet, assessment at teacher discretion</p> <p>Lesson 6, Day 1 <i>Decision-Making Framework</i>—capture sheet</p>
A4.2	Describe conditions that promote cell growth under aseptic conditions in the laboratory and workplace.	<p>Lesson 2, Day 1 <i>Background Reading: Fermentation</i>—capture sheet <i>Vocabulary Tool</i> <i>Exit Ticket</i>—strategy, assessment at teacher discretion</p> <p>Lesson 2, Day 2 <i>Background Reading: Effects of Variables on Yogurt Production</i>, jigsaw—capture sheet <i>Student Guide, Part 1: Pre-Lab</i>—capture sheet <i>Toolkit, Yogurt Fermentation</i>, question 1—capture sheet, assessment at teacher discretion</p> <p>Lesson 2, Day 3 <i>Student Guide, Part 2: Lab</i>—capture sheet</p> <p>Lesson 2, Day 4 <i>Student Guide, Part 2: Lab</i>—capture sheet <i>Interview with a Scientist</i>—capture sheet</p> <p>Lesson 2, Day 5 <i>Student Guide, Part 2: Lab</i>—capture sheet</p>

Standard	Description	Assessed
		<p><i>Student Guide, Part 3: Data Analysis</i>, questions 3 and 4—capture sheet</p> <p><i>Gallery Walk</i>—strategy, assessment at teacher discretion</p> <p><i>Think-Pair-Share</i>—strategy, assessment at teacher discretion</p> <p><i>Student Guide, Part 4: Answer the Driving Question</i>—capture sheet</p>
A4.3	Use various methods to monitor the growth of cell cultures.	<p>Lesson 2, Day 1</p> <p><i>Exit Ticket</i>—strategy, assessment at teacher discretion</p> <p>Lesson 2, Day 2</p> <p><i>Background Reading: Effects of Variables on Yogurt Production</i>, jigsaw—capture sheet</p> <p><i>Student Guide, Part 1: Pre-Lab</i>—capture sheet</p> <p><i>Toolkit, Yogurt Fermentation</i>, question 1—capture sheet, assessment at teacher discretion</p> <p>Lesson 2, Day 3</p> <p><i>Student Guide, Part 2: Lab</i>—capture sheet</p> <p>Lesson 2, Day 4</p> <p><i>Student Guide, Part 2: Lab</i>—capture sheet</p> <p><i>Background Reading: Interview with a Scientist</i>—capture sheet</p> <p>Lesson 2, Day 5</p> <p><i>Student Guide, Part 2: Lab</i>—capture sheet</p> <p><i>Student Guide, Part 3: Data Analysis</i>, questions 3 and 4—capture sheet</p> <p><i>Gallery Walk</i>—strategy, assessment at teacher discretion</p> <p><i>Think-Pair-Share</i>—strategy, assessment at teacher discretion</p> <p><i>Student Guide, Part 4: Answer the Driving Question</i>—capture sheet</p>
A5.0: Integrate computer skills into program components.		
A5.1	Use the Internet and World Wide Web to collect and share scientific information.	<p>Lesson 1, Day 2</p> <p><i>Microscope Slide</i>—capture sheet</p> <p><i>Discussion</i>, whole group—strategy, assessment at teacher discretion</p> <p>Lesson 1, Day 3</p> <p><i>Superhero/Anime/Fantasy Creature Analogy</i>—capture sheet</p> <p>Lesson 1, Day 4</p> <p><i>Superhero Microbe Storyboard</i>—capture sheet</p> <p>Lesson 1, Day 5</p> <p><i>Superhero Microbe Comic</i>—rubric</p>

Standard	Description	Assessed
		<p>Lesson 3, Day 1 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 1—capture sheet <i>Discussion</i>, small group—strategy, assessment at teacher discretion</p> <p>Lesson 3, Day 2 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 2 — capture sheet <i>Toolkit, Microbes and Food (Menu)</i>, questions 1 and 2—capture sheet, assessment at teacher discretion <i>Exit Ticket</i>—strategy, assessment at teacher discretion</p> <p>Lesson 3, Day 3 <i>Microgrub Poster</i>—checklist <i>Toolkit, Microbes and Food (Menu)</i>, visual representation—capture sheet, assessment at teacher discretion</p> <p>Lesson 4, Day 1 <i>Antibiotics Resistance Simulation</i>, Part 2—capture sheet</p> <p>Lesson 4, Day 3 <i>Clinical Trials for a New Phage Therapy</i>, Part 2, question 4—capture sheet <i>Clinical Trials for a New Phage Therapy</i>, Part 3—capture sheet <i>Clinical Trials for a New Phage Therapy</i>, Part 4—capture sheet</p>
A5.2	Use a variety of methods, including literature searches in libraries, computer databases, and online for gathering background information, making observations, and collecting and organizing data.	<p>Lesson 1, Day 2 <i>Microscope Slide</i>—capture sheet <i>Discussion</i>, whole group—strategy, assessment at teacher discretion</p> <p>Lesson 1, Day 3 <i>Superhero/Anime/Fantasy Creature Analogy</i>—capture sheet</p> <p>Lesson 1, Day 4 <i>Superhero Microbe Storyboard</i>—capture sheet</p> <p>Lesson 1, Day 5 <i>Superhero Microbe Comic</i>—rubric</p>
A6.0: Implement use of the metric system, orders of magnitude, and the pH scale in preparation of reagents, analysis of data, and graphing.		
A6.4	Create data tables and graphs using Excel for the purpose of collecting and analyzing data.	<p>Lesson 4, Day 1 <i>Antibiotics Resistance Simulation</i>, Part 2—capture sheet <i>Antibiotics Resistance Simulation</i>, Part 3—capture sheet</p>

Standard	Description	Assessed
A7.0: Understand the function of regulatory agencies for the biotechnology industry and the lasting impact of routine laboratory and communication practices on product development and manufacturing.		
A7.1	Identify agencies at the local, state, and federal levels.	<p>Lesson 3, Day 1 <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 1—capture sheet</p> <p>Lesson 3, Day 2 <i>Synthetic Biology Article</i>—capture sheet <i>Microgrub Research, Environmentalist/Food Scientist/Financial Analyst/NGO Worker</i>, question 2 — capture sheet</p> <p>Lesson 3, Day 3 <i>Microgrub Poster</i>—checklist</p>
A7.2	Be aware of the role of agencies in promoting patient safety, quality control, and entrepreneurship.	<p>Lesson 4, Day 2 <i>When a Virus Is the Cure</i>—capture sheet</p> <p>Lesson 4, Day 3 <i>Discussion</i>, whole group—strategy, assessment at teacher discretion <i>Clinical Trials for a New Phage Therapy</i>, Part 2, questions 1–3—capture sheet <i>Clinical Trials for a New Phage Therapy</i>, Part 3—capture sheet</p> <p>Lesson 4, Day 3 <i>Clinical Trials for a New Phage Therapy</i>, Part 4—capture sheet <i>Toolkit, Antibiotics, Resistance, and Combating Disease</i>—capture sheet, assessment at teacher discretion</p>
A8.0: Follow sustainable and safe practices with high regard for quality control.		
A8.1	Follow written protocols and oral directions to perform a variety of laboratory and technical tasks.	<p>Lesson 2, Day 1 <i>Student Guide, Part 1: Pre-Lab</i>, questions 1 and 2—capture sheet <i>Background Reading: Fermentation</i>—capture sheet</p> <p>Lesson 2, Day 2 <i>Background Reading: Effects of Variables on Yogurt Production</i>, jigsaw—capture sheet <i>Student Guide, Part 1: Pre-Lab</i>—capture sheet</p> <p>Lesson 2, Day 3 <i>Student Guide, Part 2: Lab</i>—capture sheet</p> <p>Lesson 2, Day 4 <i>Student Guide, Part 2: Lab</i>—capture sheet</p>

Standard	Description	Assessed
		<p><i>Background Reading: Interview with a Scientist</i>—capture sheet</p> <p>Lesson 2, Day 5</p> <p><i>Student Guide, Part 2: Lab</i>—capture sheet</p> <p><i>Student Guide, Part 3: Data Analysis</i>, questions 1-4—capture sheet</p> <p><i>Gallery Walk</i>—strategy, assessment at teacher discretion</p> <p><i>Think-Pair-Share</i>—strategy, assessment at teacher discretion</p> <p><i>Student Guide, Part 4: Answer the Driving Question</i>—capture sheet</p> <p>Lesson 7, Day 1</p> <p><i>Student Guide, Part 1: Pre-Lab</i>, questions 1 and 2—capture sheet</p> <p>Lesson 7, Day 2</p> <p><i>Student Protocol, Part 1: Insect DNA Extraction and PCR</i>, steps 1-18—capture sheet</p> <p><i>Exit Ticket</i>—strategy, assessment at teacher discretion</p> <p>Lesson 7, Day 3</p> <p><i>Student Protocol, Part 1: Insect DNA Extraction and PCR</i>, steps 19-30—capture sheet</p> <p><i>Background Reading: What Is Polymerase Chain Reaction (PCR)?</i>—capture sheet</p> <p><i>Exit Ticket</i>—strategy, assessment at teacher discretion</p> <p>Lesson 7, Day 4</p> <p><i>Student Protocol, Part 2: Gel Electrophoresis</i>—capture sheet</p> <p><i>Background Reading: Analyzing Wolbachia PCR Results</i>—capture sheet</p> <p><i>Student Guide, Part 2: Lab</i>—capture sheet</p> <p><i>Student Guide, Part 3: Data Analysis</i>, question 1—capture sheet</p>
2.5	Properly and safely use and monitor a variety of scientific equipment, including pH meters, microscopes, spectrophotometers, pipettes, micropipettes, and balances.	<p>Lesson 2, Day 1</p> <p><i>Student Guide, Part 1: Pre-Lab</i>, question 2—capture sheet</p> <p>Lesson 2, Day 2</p> <p><i>Background Reading: Effects of Variables on Yogurt Production</i>, jigsaw—capture sheet</p> <p><i>Student Guide, Part 1: Pre-Lab</i>—capture sheet</p> <p>Lesson 2, Day 3</p> <p><i>Student Guide, Part 2: Lab</i>—capture sheet</p> <p>Lesson 2, Day 4</p> <p><i>Student Guide, Part 2: Lab</i>—capture sheet</p>

Standard	Description	Assessed
		<p>Lesson 2, Day 5 <i>Student Guide, Part 2: Lab—capture sheet</i></p> <p>Lesson 7, Day 2 <i>Student Protocol, Part 1: Insect DNA Extraction and PCR, steps 1–18—capture sheet</i> <i>Exit Ticket—strategy, assessment at teacher discretion</i></p> <p>Lesson 7, Day 3 <i>Student Protocol, Part 1: Insect DNA Extraction and PCR, steps 19–30—capture sheet</i> <i>Background Reading: What Is Polymerase Chain Reaction (PCR)?—capture sheet</i> <i>Exit Ticket—strategy, assessment at teacher discretion</i></p> <p>Lesson 7, Day 4 <i>Student Protocol, Part 2: Gel Electrophoresis—capture sheet</i> <i>Student Guide, Part 2: Lab—capture sheet</i></p>
A8.7	Determine which equipment is appropriate to use for a given task and the units of measurement used.	<p>Lesson 2, Day 1 <i>Student Guide, Part 1: Pre-Lab, question 2—capture sheet</i></p> <p>Lesson 2, Day 2 <i>Student Guide, Part 1: Pre-Lab—capture sheet</i></p> <p>Lesson 2, Day 3 <i>Student Guide, Part 2: Lab—capture sheet</i></p> <p>Lesson 2, Day 4 <i>Student Guide, Part 2: Lab—capture sheet</i></p> <p>Lesson 2, Day 5 <i>Student Guide, Part 2: Lab—capture sheet</i></p> <p>Lesson 7, Day 2 <i>Student Protocol, Part 1: Insect DNA Extraction and PCR, steps 1–18—capture sheet</i></p> <p>Lesson 7, Day 3 <i>Student Protocol, Part 1: Insect DNA Extraction and PCR, steps 19–30—capture sheet</i> <i>Background Reading: What Is Polymerase Chain Reaction (PCR)?—capture sheet</i> <i>Exit Ticket—strategy, assessment at teacher discretion</i></p> <p>Lesson 7, Day 4 <i>Student Protocol, Part 2: Gel Electrophoresis—capture sheet</i> <i>Student Guide, Part 2: Lab—capture sheet</i></p>

Standard	Description	Assessed
A8.8	Perform specimen collection, label samples, and prepare samples for testing.	<p>Lesson 7, Day 1 <i>Student Guide, Part 1: Pre-Lab</i>, questions 1 and 2—capture sheet</p> <p>Lesson 7, Day 2 <i>Student Protocol, Part 1: Insect DNA Extraction and PCR</i>, steps 1–18—capture sheet</p> <p>Lesson 7, Day 3 <i>Student Protocol, Part 1: Insect DNA Extraction and PCR</i>, steps 19–30—capture sheet <i>Background Reading: What Is Polymerase Chain Reaction (PCR)?</i>—capture sheet</p> <p>Lesson 7, Day 4 <i>Student Protocol, Part 2: Gel Electrophoresis</i>—capture sheet <i>Student Guide, Part 2: Lab</i>—capture sheet</p>
A8.9	Handle, transport and store samples safely.	<p>Lesson 7, Day 1 <i>Student Guide, Part 1: Pre-Lab</i>, questions 1 and 2—capture sheet</p> <p>Lesson 7, Day 2 <i>Student Protocol, Part 1: Insect DNA Extraction and PCR</i>, steps 1–18—capture sheet</p> <p>Lesson 7, Day 3 <i>Student Protocol, Part 1: Insect DNA Extraction and PCR</i>, steps 19–30—capture sheet</p> <p>Lesson 7, Day 4 <i>Student Protocol, Part 2: Gel Electrophoresis</i>—capture sheet <i>Student Guide, Part 2: Lab</i>—capture sheet</p>



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