

**Inquiry Investigations™**  
**Biotechnology Applications MODULE - 1278382**  
**Grades: 7-10**

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**Arizona Academic Standards**  
**Science**  
**Grade 7**

STRAND	AZ.SC07-S1.	Inquiry Process
CONCEPT / STANDARD	SC07-S1C1.	Observations, Questions, and Hypotheses: Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S1C1-01.	<p>Formulate questions based on observations that lead to the development of a hypothesis (See M07-S2C1-01).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S1C1-02.	<p>Select appropriate resources for background information related to a question, for use in the design of a controlled investigation (See W07-S3C6-01, R07-S3C1-06, and R07-S3C2-03).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1:</li> </ul>

		<p>Genetically Modified Crops</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
<b>STRAND</b>	AZ.SC07-S1.	Inquiry Process
<b>CONCEPT / STANDARD</b>	SC07-S1C2.	Scientific Testing (Investigating and Modeling): Design and conduct controlled investigations.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SC07-S1C2-01.	<p>Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SC07-S1C2-03.</p>	<p>Conduct a controlled investigation, utilizing multiple trials, to test a hypothesis using scientific processes.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SC07-S1C2-04.</p>	<p>Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> </ul>

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<b>STRAND</b>	<b>AZ.SC07-S1.</b>	<b>Inquiry Process</b>
<b>CONCEPT / STANDARD</b>	<b>SC07-S1C3.</b>	Analysis and Conclusions: Analyze and interpret data to explain correlations and results; formulate new questions.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SC07-S1C3-01.</b>	<p>Analyze data obtained in a scientific investigation to identify trends. (See M07-S2C1-07 and M07-S2C1-08) .</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of</li> </ul>

		<p>the Second Examination</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S1C3-03.	<p>Analyze results of data collection in order to accept or reject the hypothesis.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S1C3-05.	<p>Formulate a conclusion based on data analysis.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing</li> </ul>

		<p>Karyotypes</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S1C3-07.	<p>Formulate new questions based on the results of a previous investigation.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
STRAND	AZ.SC07-S1.	Inquiry Process
CONCEPT / STANDARD	SC07-	Communication: Communicate results of investigations.

	S1C4.	
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S1C4-01.	<p>Choose an appropriate graphic representation for collected data: line graph; double bar graph; stem and leaf plot; histogram (See M07-S2C1-03).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S1C4-02.	<p>Display data collected from a controlled investigation. (See M07-S2C1-03).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S1C4-03.	<p>Communicate the results of an investigation with appropriate use of qualitative and quantitative information. (See W07-S3C2-01) .</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing</li> </ul>

		<p>Karyotypes</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SC07-S1C4-04.</p>	<p>Write clear, step-by-step instructions for following procedures (without the use of personal pronouns) (See W07-S3C3-01) .</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>

PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S1C4-05.	<p>Communicate the results and conclusion of the investigation. (See W07-S3C6-02) .</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
STRAND	AZ.SC07-S2.	History and Nature of Science
CONCEPT / STANDARD	SC07-S2C1.	History of Science as a Human Endeavor: Identify individual, cultural, and technological contributions to scientific knowledge.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S2C1-02.	<p>Describe how a major milestone in science or technology has revolutionized the thinking of the time (e.g., global positioning system, telescopes, seismographs, photography).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S2C1-03.	Analyze the impact of a major scientific development occurring within the past decade.

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> </ul>
<b>STRAND</b>	<b>AZ.SC07-S2.</b>	<b>History and Nature of Science</b>
<b>CONCEPT / STANDARD</b>	<b>SC07-S2C2.</b>	<b>Nature of Scientific Knowledge Understand how science is a process for generating knowledge.</b>
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SC07-S2C2-01.</b>	<p>Describe how science is an ongoing process that changes in response to new information and discoveries.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> </ul>
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SC07-S2C2-02.</b>	<p>Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S2C2-03.	<p>Apply the following scientific processes to other problem solving or decision making situations: Observing; questioning; communicating; comparing; measuring; classifying; predicting; organizing data; inferring; generating hypotheses; identifying variables.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
STRAND	AZ.SC07-S3.	Science in Personal and Social Perspectives
CONCEPT / STANDARD	SC07-S3C1.	Changes in Environments: Describe the interactions between human populations, natural hazards, and the environment.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S3C1-01.	<p>Analyze environmental risks (e.g., pollution, destruction of habitat) caused by human interaction with biological or geological systems.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining</li> </ul>

		Oil-Degrading Microbes
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S3C1-03.	Propose possible solutions to address the environmental risks in biological or geological systems. <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
STRAND	AZ.SC07-S3.	Science in Personal and Social Perspectives
CONCEPT / STANDARD	SC07-S3C2.	Science and Technology in Society: Develop viable solutions to a need or problem.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S3C2-01.	Propose viable methods of responding to an identified need or problem. . <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S3C2-02.	Compare solutions to best address an identified need or problem. <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1:</li> </ul>

		<p>Biodegrading a Simulated Oil Spill</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S3C2-04.	<p>Describe a scientific discovery that influences technology.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> </ul>
STRAND	AZ.SC07-S4.	Life Science
CONCEPT / STANDARD	SC07-	Populations of Organisms in an Ecosystem: Analyze the relationships

	S4C3.	among various organisms and their environment.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S4C3-04.	<p>Evaluate data related to problems associated with population growth (e.g., overgrazing, forest management, invasion of non-native species) and the possible solutions.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S4C3-05.	<p>Predict how environmental factors (e.g., floods, droughts, temperature changes) affect survival rates in living organisms.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC07-S4C3-06.	<p>Create a model of the interactions of living organisms within an ecosystem.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> </ul>

**Arizona Academic Standards  
Science  
Grade 8**

STRAND	AZ.SC08-S1.	Inquiry Process
CONCEPT / STANDARD	SC08-S1C1.	Observations, Questions, and Hypotheses: Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S1C1-01.	<p>Formulate questions based on observations that lead to the development of a hypothesis. (See M08-S2C1-01).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<b>STRAND</b>	AZ.SC08-S1.	<b>Inquiry Process</b>
<b>CONCEPT / STANDARD</b>	SC08-S1C2.	Scientific Testing (Investigating and Modeling): Design and conduct controlled investigations.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SC08-S1C2-01.	<p>Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human</li> </ul>

		Karyotype
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S1C2-02.	<p>Design a controlled investigation to support or reject a hypothesis.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S1C2-03.	<p>Conduct a controlled investigation to support or reject a hypothesis.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling</li> </ul>

		<p>DNA Profiles to Solve a Mystery</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S1C2-04.	<p>Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
STRAND	AZ.SC08-S1.	Inquiry Process
CONCEPT / STANDARD	SC08-S1C3.	Analysis and Conclusions: Analyze and interpret data to explain correlations and results; formulate new questions.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S1C3-01.	<p>Analyze data obtained in a scientific investigation to identify trends. (See M08-S2C1-08).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1:</li> </ul>

		<p>Biodegrading a Simulated Oil Spill</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SC08-S1C3-03.</p>	<p>Interpret data that show a variety of possible relationships between two variables, including: positive relationship; negative relationship; no relationship.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SC08-S1C3-04.</p>	<p>Formulate a future investigation based on the data collected.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S1C3-08.	<p>Formulate new questions based on the results of a previous investigation.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
STRAND	AZ.SC08-S1.	Inquiry Process
CONCEPT / STANDARD	SC08-S1C4.	Communication: Communicate results of investigations.

<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SC08-S1C4-01.</p>	<p>Communicate the results of an investigation.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SC08-S1C4-02.</p>	<p>Choose an appropriate graphic representation for collected data: line graph; double bar graph; stem and leaf plot; histogram (See M08-S2C1-03).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SC08-S1C4-03.</p>	<p>Present analyses and conclusions in clear, concise formats (See W08-S3C6-02).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing</li> </ul>

		<p>Karyotypes</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SC08-S1C4-04.</p>	<p>Write clear, step-by-step instructions for conducting investigations or operating equipment (without the use of personal pronouns) (See W08-S3C3-01).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SC08-S1C4-05.</p>	<p>Communicate the results and conclusion of the investigation. (See W08-S3C6-02).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<b>STRAND</b>	AZ.SC08-S2.	<b>History and Nature of Science</b>
<b>CONCEPT / STANDARD</b>	SC08-S2C1.	History of Science as a Human Endeavor: Identify individual, cultural, and technological contributions to scientific knowledge.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SC08-S2C1-03.	<p>Evaluate the impact of a major scientific development occurring within the past decade.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> </ul>
<b>STRAND</b>	AZ.SC08-S2.	<b>History and Nature of Science</b>
<b>CONCEPT / STANDARD</b>	SC08-S2C2.	Nature of Scientific Knowledge: Understand how science is a process for generating knowledge.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SC08-S2C2-01.	<p>Apply the following scientific processes to other problem solving or decision making situations: Observing; questioning; communicating; comparing; measuring; classifying; predicting; organizing data; inferring; generating hypotheses; identifying variables.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making</li> </ul>

		<p>Cheese the Biotech Way</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SC08-S2C2-02.</p>	<p>Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S2C2-03.	<p>Defend the principle that accurate record keeping, openness, and replication are essential for maintaining an investigator's credibility with other scientists and society.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> </ul>
STRAND	AZ.SC08-S3.	Science in Personal and Social Perspectives
CONCEPT / STANDARD	SC08-S3C1.	Changes in Environments: Describe the interactions between human populations, natural hazards, and the environment.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S3C1-01.	<p>Analyze the risk factors associated with natural, human induced, and/or biological hazards, including: waste disposal of industrial chemicals; greenhouse gases.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S3C1-02.	<p>Analyze possible solutions to address the environmental risks associated with chemicals and biological systems.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
STRAND	AZ.SC08-S3.	Science in Personal and Social Perspectives
CONCEPT / STANDARD	SC08-S3C2.	Science and Technology in Society: Develop viable solutions to a need or problem.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S3C2-01.	<p>Propose viable methods of responding to an identified need or problem. .</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SC08-S3C2-02.</p>	<p>Compare solutions to best address an identified need or problem.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1:</li> </ul>

		<p>Comparing Electrophoresed DNA Profiles</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S3C2-04.	<p>Compare risks and benefits of the following technological advances: radiation treatments; genetic engineering (See Strand 4 Concept 2); airbags (See Strand 5 Concept 2).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> </ul>
STRAND	AZ.SC08-S4.	Life Science
CONCEPT / STANDARD	SC08-S4C2.	Reproduction and Heredity: Understand the basic principles of heredity.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S4C2-01.	<p>Explain the purposes of cell division: growth and repair; reproduction.</p> <ul style="list-style-type: none"> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S4C2-02.	<p>Explain the basic principles of heredity using the human examples of: eye color; widow's peak; blood type.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> </ul>

PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S4C2-03.	Distinguish between the nature of dominant and recessive traits in humans. <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> </ul>
STRAND	AZ.SC08-S4.	Life Science
CONCEPT / STANDARD	SC08-S4C4.	Diversity, Adaptation, and Behavior: Identify structural and behavioral adaptations.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S4C4-01.	Explain how an organism's behavior allows it to survive in an environment. <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S4C4-03.	Determine characteristics of organisms that could change over several generations. <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> </ul>
STRAND	AZ.SC08-S5.	Physical Science
CONCEPT / STANDARD	SC08-S5C1.	Properties and Changes of Properties in Matter: Understand physical and chemical properties of matter.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SC08-S5C1-02.	Identify different kinds of matter based on the following chemical properties: Reactivity; pH; oxidation (corrosion). <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> </ul>

Science  
Grade 9

STRAND	AZ.SCHS-S1.	Inquiry Process
CONCEPT / STANDARD	SCHS-S1C1.	Observations, Questions, and Hypotheses: Formulate predictions, questions, or hypotheses based on observations. Evaluate appropriate resources.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S1C1-02.	<p>Develop questions from observations that transition into testable hypotheses.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S1C1-04.	<p>Predict the outcome of an investigation based on prior evidence, probability, and/or modeling (not guessing or inferring).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<b>STRAND</b>	<b>AZ.SCHS-S1.</b>	<b>Inquiry Process</b>
<b>CONCEPT / STANDARD</b>	<b>SCHS-S1C2.</b>	Scientific Testing (Investigating and Modeling): Design and conduct controlled investigations.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S1C2-01.</b>	<p>Demonstrate safe and ethical procedures (e.g., use and care of technology, materials, organisms) and behavior in all science inquiry.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> </ul>

		<ul style="list-style-type: none"> <li>Teacher Resource CD: Biotechnology in Medicine</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S1C2-02.	<p>Identify the resources needed to conduct an investigation.</p> <ul style="list-style-type: none"> <li>Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S1C2-03.	<p>Design an appropriate protocol (written plan of action) for testing a hypothesis: Identify dependent and independent variables in a controlled investigation. Determine an appropriate method for data collection (e.g., using balances, thermometers, microscopes, spectrophotometer, using qualitative changes). Determine an appropriate method for recording data (e.g., notes, sketches, photographs, videos, journals (logs), charts, computers/calculators).</p> <ul style="list-style-type: none"> <li>Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue</li> </ul>

		<p>People of Troublesome Creek</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SCHS-S1C2-04.</p>	<p>Conduct a scientific investigation that is based on a research design.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY</p>	<p>SCHS-S1C2-05.</p>	<p>Record observations, notes, sketches, questions, and ideas using tools such as journals, charts, graphs, and computers. .</p>

LEVEL		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
STRAND	AZ.SCHS-S1.	Inquiry Process
CONCEPT / STANDARD	SCHS-S1C3.	Analysis, Conclusions, and Refinements: Evaluate experimental design, analyze data to explain results and propose further investigations. Design models.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S1C3-01.	<p>Interpret data that show a variety of possible relationships between variables, including: positive relationship; negative relationship; no relationship.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> </ul>

<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SCHS-S1C3-02.</p>	<p>Evaluate whether investigational data support or do not support the proposed hypothesis.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SCHS-S1C3-04.</p>	<p>Evaluate the design of an investigation to identify possible sources of procedural error, including: sample size; trials; controls; analyses.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SCHS-S1C3-06.</p>	<p>Use descriptive statistics to analyze data, including: Mean; frequency; range (See MHS-S2C1-10).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SCHS-S1C3-07.</p>	<p>Propose further investigations based on the findings of a conducted investigation.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>

STRAND	AZ.SCHS-S1.	Inquiry Process
CONCEPT / STANDARD	SCHS-S1C4.	Communication: Communicate results of investigations.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S1C4-01.	<p>For a specific investigation, choose an appropriate method for communicating the results. (See W09-S3C2-01 and W10-S3C3-01).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S1C4-02.	<p>Produce graphs that communicate data. (See MHS-S2C1-02).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> </ul>

PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S1C4-03.	<p>Communicate results clearly and logically. .</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
STRAND	AZ.SCHS-S2.	History and Nature of Science
CONCEPT / STANDARD	SCHS-S2C1.	History of Science as a Human Endeavor: Identify individual, cultural, and technological contributions to scientific knowledge.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S2C1-03.	<p>Analyze how specific changes in science have affected society. .</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S2C1-04.	<p>Analyze how specific cultural and/or societal issues promote or hinder scientific advancements.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> </ul>
STRAND	AZ.SCHS-S2.	History and Nature of Science
CONCEPT / STANDARD	SCHS-S2C2.	Nature of Scientific Knowledge: Understand how science is a process for generating knowledge.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S2C2-02.	<p>Explain the process by which accepted ideas are challenged or extended by scientific innovation.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically</li> </ul>

		Modified Crops
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S2C2-03.	<p>Distinguish between pure and applied science.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
STRAND	AZ.SCHS-S3.	Science in Personal and Social Perspectives
CONCEPT / STANDARD	SCHS-S3C1.	Changes in Environments: Describe the interactions between human populations, natural hazards, and the environment.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S3C1-01.	<p>Evaluate how the processes of natural ecosystems affect, and are affected by, humans.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S3C1-02.	<p>Describe the environmental effects of the following natural and/or human-caused hazards: Flooding; drought; earthquakes; fires; pollution; extreme weather.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S3C1-03.	<p>Assess how human activities (e.g., clear cutting, water management, tree thinning) can affect the potential for hazards.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> </ul>

		<ul style="list-style-type: none"> <li>Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
<b>STRAND</b>	AZ.SCHS-S4.	Life Science
<b>CONCEPT / STANDARD</b>	SCHS-S4C1.	The Cell: Understand the role of the cell and cellular processes.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SCHS-S4C1-05.	Describe the purposes and processes of cellular reproduction. <ul style="list-style-type: none"> <li>Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<b>STRAND</b>	AZ.SCHS-S4.	Life Science
<b>CONCEPT / STANDARD</b>	SCHS-S4C2.	Molecular Basis of Heredity: Understand the molecular basis of heredity and resulting genetic diversity.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SCHS-S4C2-01.	Analyze the relationships among nucleic acids (DNA, RNA), genes, and chromosomes. <ul style="list-style-type: none"> <li>Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>Teacher Resource CD: Biotechnology in Forensic Science</li> <li>Teacher Resource CD: Biotechnology in Medicine</li> <li>Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SCHS-S4C2-02.	Describe the molecular basis of heredity, in viruses and living things, including DNA replication and protein synthesis. <ul style="list-style-type: none"> <li>Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S4C2-03.	<p>Explain how genotypic variation occurs and results in phenotypic diversity.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> </ul>
STRAND	AZ.SCHS-S4.	Life Science
CONCEPT / STANDARD	SCHS-S4C3.	Interdependence of Organisms: Analyze the relationships among various organisms and their environment.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S4C3-01.	<p>Identify the relationships among organisms within populations, communities, ecosystems, and biomes.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S4C3-03.	<p>Assess how the size and the rate of growth of a population are determined by birth rate, death rate, immigration, emigration, and carrying capacity of the environment.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue</li> </ul>

		People of Troublesome Creek
<b>STRAND</b>	AZ.SCHS-S4.	Life Science
<b>CONCEPT / STANDARD</b>	SCHS-S4C4.	Biological Evolution: Understand the scientific principles and processes involved in biological evolution.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SCHS-S4C4-01.	<p>Identify the following components of natural selection, which can lead to speciation: potential for a species to increase its numbers; genetic variability and inheritance of offspring due to mutation and recombination of genes; finite supply of resources required for life; selection by the environment of those offspring better able to survive and produce offspring.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> </ul>
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SCHS-S4C4-02.	<p>Explain how genotypic and phenotypic variation can result in adaptations that influence an organism's success in an environment.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> </ul>
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SCHS-S4C4-04.	<p>Predict how a change in an environmental factor (e.g., rainfall, habitat loss, non-native species) can affect the number and diversity of species in an ecosystem.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> </ul>
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SCHS-S4C4-05.	<p>Analyze how patterns in the fossil record, nuclear chemistry, geology, molecular biology, and geographical distribution give support to the theory of organic evolution through natural selection over billions of years and the resulting present day biodiversity.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> </ul>
<b>STRAND</b>	AZ.SCHS-S5.	Physical Science
<b>CONCEPT / STANDARD</b>	SCHS-S5C2.	Motions and Forces: Analyze relationships between forces and motion.

PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S5C2-01.	Determine the rate of change of a quantity (e.g., rate of erosion, rate of reaction, rate of growth, velocity). <ul style="list-style-type: none"> <li>Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> </ul>
STRAND	AZ.SCHS-S5.	Physical Science
CONCEPT / STANDARD	SCHS-S5C4.	Chemical Reactions: Investigate relationships between reactants and products in chemical reactions.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S5C4-12.	Compare the nature, behavior, concentration, and strengths of acids and bases. <ul style="list-style-type: none"> <li>Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> </ul>
STRAND	AZ.SCHS-S6.	Earth and Space Science
CONCEPT / STANDARD	SCHS-S6C3.	Origin and Evolution of the Earth System: Analyze the factors used to explain the history and evolution of the Earth.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S6C3-06.	Earth History/Evolution: Investigate scientific theories of how life originated on Earth (high temperature, low oxygen, clay catalyst model). <ul style="list-style-type: none"> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S6C3-07.	Earth History/Evolution: Describe how life on Earth has influenced the evolution of the Earth's systems. <ul style="list-style-type: none"> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> </ul>

Arizona Academic Standards  
Science  
Grade 10

STRAND	AZ.SCHS-S1.	Inquiry Process
CONCEPT / STANDARD	SCHS-S1C1.	Observations, Questions, and Hypotheses: Formulate predictions, questions, or hypotheses based on observations. Evaluate appropriate resources.
PERFORMANCE OBJECTIVE /	SCHS-S1C1-02.	Develop questions from observations that transition into testable hypotheses.

<p>PROFICIENCY LEVEL</p>		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SCHS-S1C1-04.</p>	<p>Predict the outcome of an investigation based on prior evidence, probability, and/or modeling (not guessing or inferring).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<b>STRAND</b>	<b>AZ.SCHS-S1.</b>	<b>Inquiry Process</b>
<b>CONCEPT / STANDARD</b>	<b>SCHS-S1C2.</b>	Scientific Testing (Investigating and Modeling): Design and conduct controlled investigations.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S1C2-01.</b>	<p>Demonstrate safe and ethical procedures (e.g., use and care of technology, materials, organisms) and behavior in all science inquiry.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> </ul>
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S1C2-02.</b>	<p>Identify the resources needed to conduct an investigation.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading</li> </ul>

		<p>a Simulated Oil Spill</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SCHS-S1C2-03.</p>	<p>Design an appropriate protocol (written plan of action) for testing a hypothesis: Identify dependent and independent variables in a controlled investigation. Determine an appropriate method for data collection (e.g., using balances, thermometers, microscopes, spectrophotometer, using qualitative changes). Determine an appropriate method for recording data (e.g., notes, sketches, photographs, videos, journals (logs), charts, computers/calculators).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SCHS-S1C2-04.</p>	<p>Conduct a scientific investigation that is based on a research design.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SCHS-S1C2-05.</p>	<p>Record observations, notes, sketches, questions, and ideas using tools such as journals, charts, graphs, and computers. .</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining</li> </ul>

		<p>Oil-Degrading Microbes</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<b>STRAND</b>	AZ.SCHS-S1.	<b>Inquiry Process</b>
<b>CONCEPT / STANDARD</b>	SCHS-S1C3.	Analysis, Conclusions, and Refinements: Evaluate experimental design, analyze data to explain results and propose further investigations. Design models.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SCHS-S1C3-01.	<p>Interpret data that show a variety of possible relationships between variables, including: positive relationship; negative relationship; no relationship.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> </ul>
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	SCHS-S1C3-02.	<p>Evaluate whether investigational data support or do not support the proposed hypothesis.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SCHS-S1C3-04.</p>	<p>Evaluate the design of an investigation to identify possible sources of procedural error, including: sample size; trials; controls; analyses.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S1C3-06.	<p>Use descriptive statistics to analyze data, including: Mean; frequency; range (See MHS-S2C1-10).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S1C3-07.	<p>Propose further investigations based on the findings of a conducted investigation.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
STRAND	AZ.SCHS-S1.	Inquiry Process
CONCEPT / STANDARD	SCHS-S1C4.	Communication: Communicate results of investigations.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S1C4-01.	<p>For a specific investigation, choose an appropriate method for communicating the results. (See W09-S3C2-01 and W10-S3C3-01).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making</li> </ul>

		<p>Cheese the Biotech Way</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SCHS-S1C4-02.</p>	<p>Produce graphs that communicate data. (See MHS-S2C1-02).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> </ul>
<p>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</p>	<p>SCHS-S1C4-03.</p>	<p>Communicate results clearly and logically. .</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining</li> </ul>

		<p>Oil-Degrading Microbes</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
<b>STRAND</b>	<b>AZ.SCHS-S2.</b>	<b>History and Nature of Science</b>
<b>CONCEPT / STANDARD</b>	<b>SCHS-S2C1.</b>	History of Science as a Human Endeavor: Identify individual, cultural, and technological contributions to scientific knowledge.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S2C1-03.</b>	<p>Analyze how specific changes in science have affected society. .</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> </ul>
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S2C1-04.</b>	<p>Analyze how specific cultural and/or societal issues promote or hinder scientific advancements.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> </ul>
<b>STRAND</b>	<b>AZ.SCHS-S2.</b>	<b>History and Nature of Science</b>
<b>CONCEPT / STANDARD</b>	<b>SCHS-S2C2.</b>	Nature of Scientific Knowledge: Understand how science is a process for generating knowledge.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S2C2-02.</b>	<p>Explain the process by which accepted ideas are challenged or extended by scientific innovation.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> </ul>
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S2C2-03.</b>	<p>Distinguish between pure and applied science.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> </ul>

		<ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> </ul>
<b>STRAND</b>	<b>AZ.SCHS-S3.</b>	<b>Science in Personal and Social Perspectives</b>
<b>CONCEPT / STANDARD</b>	<b>SCHS-S3C1.</b>	Changes in Environments: Describe the interactions between human populations, natural hazards, and the environment.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S3C1-01.</b>	<p>Evaluate how the processes of natural ecosystems affect, and are affected by, humans.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S3C1-02.</b>	<p>Describe the environmental effects of the following natural and/or human-caused hazards: Flooding; drought; earthquakes; fires; pollution; extreme weather.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S3C1-03.</b>	<p>Assess how human activities (e.g., clear cutting, water management, tree thinning) can affect the potential for hazards.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
<b>STRAND</b>	<b>AZ.SCHS-S4.</b>	<b>Life Science</b>
<b>CONCEPT / STANDARD</b>	<b>SCHS-S4C1.</b>	The Cell: Understand the role of the cell and cellular processes.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S4C1-05.</b>	<p>Describe the purposes and processes of cellular reproduction.</p> <ul style="list-style-type: none"> <li>• Virtual Laboratory: Preparation and Analysis of a Human</li> </ul>

		Karyotype
STRAND	AZ.SCHS-S4.	Life Science
CONCEPT / STANDARD	SCHS-S4C2.	Molecular Basis of Heredity: Understand the molecular basis of heredity and resulting genetic diversity.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S4C2-01.	<p>Analyze the relationships among nucleic acids (DNA, RNA), genes, and chromosomes.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 3 Lab 7 Activity 1: Comparing Electrophoresed DNA Profiles</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 1: Case of the Second Examination</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human Karyotype</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S4C2-02.	<p>Describe the molecular basis of heredity, in viruses and living things, including DNA replication and protein synthesis.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 2 Lab 5 Activity 1: Diagnosing a Gene Defect</li> <li>• Biotechnology Applications: Unit 3 Lab 6 Activity 1: Modeling DNA Profiles to Solve a Mystery</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> <li>• Virtual Laboratory: Preparation and Analysis of a Human</li> </ul>

		Karyotype
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S4C2-03.	<p>Explain how genotypic variation occurs and results in phenotypic diversity.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> </ul>
STRAND	AZ.SCHS-S4.	Life Science
CONCEPT / STANDARD	SCHS-S4C3.	Interdependence of Organisms: Analyze the relationships among various organisms and their environment.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S4C3-01.	<p>Identify the relationships among organisms within populations, communities, ecosystems, and biomes.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S4C3-03.	<p>Assess how the size and the rate of growth of a population are determined by birth rate, death rate, immigration, emigration, and carrying capacity of the environment.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> </ul>
STRAND	AZ.SCHS-S4.	Life Science
CONCEPT / STANDARD	SCHS-S4C4.	Biological Evolution: Understand the scientific principles and processes involved in biological evolution.

PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S4C4-01.	<p>Identify the following components of natural selection, which can lead to speciation: potential for a species to increase its numbers; genetic variability and inheritance of offspring due to mutation and recombination of genes; finite supply of resources required for life; selection by the environment of those offspring better able to survive and produce offspring.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Teacher Resource CD: Biotechnology in Medicine</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S4C4-02.	<p>Explain how genotypic and phenotypic variation can result in adaptations that influence an organism's success in an environment.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 4 Lab 8 Activity 2: Finding Out Who Is at Risk for SARS</li> <li>• Teacher Resource CD: Biotechnology in Agriculture and the Environment</li> <li>• Teacher Resource CD: Biotechnology in Forensic Science</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S4C4-04.	<p>Predict how a change in an environmental factor (e.g., rainfall, habitat loss, non-native species) can affect the number and diversity of species in an ecosystem.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> </ul>
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S4C4-05.	<p>Analyze how patterns in the fossil record, nuclear chemistry, geology, molecular biology, and geographical distribution give support to the theory of organic evolution through natural selection over billions of years and the resulting present day biodiversity.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> </ul>
STRAND	AZ.SCHS-S5.	Physical Science
CONCEPT / STANDARD	SCHS-S5C2.	Motions and Forces: Analyze relationships between forces and motion.
PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL	SCHS-S5C2-01.	<p>Determine the rate of change of a quantity (e.g., rate of erosion, rate of reaction, rate of growth, velocity).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 1 Activity 1: Genetically Modified Crops</li> </ul>

<b>STRAND</b>	<b>AZ.SCHS-S5.</b>	<b>Physical Science</b>
<b>CONCEPT / STANDARD</b>	<b>SCHS-S5C4.</b>	Chemical Reactions: Investigate relationships between reactants and products in chemical reactions.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S5C4-12.</b>	<p>Compare the nature, behavior, concentration, and strengths of acids and bases.</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 2 Activity 1: Making Cheese the Biotech Way</li> </ul>
<b>STRAND</b>	<b>AZ.SCHS-S6.</b>	<b>Earth and Space Science</b>
<b>CONCEPT / STANDARD</b>	<b>SCHS-S6C2.</b>	Energy in the Earth System (Both Internal and External): Understand the relationships between the Earth's land masses, oceans, and atmosphere.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S6C2-12.</b>	<p>External Energy: Describe the conditions that cause severe weather (e.g., hurricanes, tornadoes, thunderstorms).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 2: Cleaning up Mini-Oil Spills in Various Shore Environments</li> <li>• Biotechnology Applications: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
<b>STRAND</b>	<b>AZ.SCHS-S6.</b>	<b>Earth and Space Science</b>
<b>CONCEPT / STANDARD</b>	<b>SCHS-S6C3.</b>	Origin and Evolution of the Earth System: Analyze the factors used to explain the history and evolution of the Earth.
<b>PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL</b>	<b>SCHS-S6C3-06.</b>	<p>Earth History/Evolution: Investigate scientific theories of how life originated on Earth (high temperature, low oxygen, clay catalyst model).</p> <ul style="list-style-type: none"> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 1: Taking a Case History of Baby Mike</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 2: Analyzing Karyotypes</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 3: The Blue People of Troublesome Creek</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 4: Uncovering a Family Secret</li> <li>• Biotechnology Applications: Unit 2 Lab 4 Activity 5: Creating a Pedigree to Analyze a Family Trait</li> </ul>

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