

# Standards Correlations

## Biotechnology Foundations in Technology Education (8468)

Task	SOL Correlations
<b>Demonstrating Personal Qualities and Abilities</b>	
Demonstrate creativity and innovation.	<p>English: 6.1, 6.3, 6.4, 6.6, 6.7, 6.9, 7.1, 7.3, 7.4, 7.6, 7.7, 7.9, 8.1, 8.3, 8.4, 8.6, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8</p> <p>History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WG.4, WHI.1, WHII.1</p> <p>Mathematics: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.10, 6.11, 6.12, 7.2, 7.3, 7.8, 7.9, 8.2, 8.4, 8.6, 8.7, 8.11, 8.12, 8.17, 8.18, A.9, AFDA.3, AFDA.4, AFDA.5, AFDA.6, AFDA.7, AFDA.8, AII.9, COM.1, COM.3, COM.4, COM.5, COM.8, DM.7, DM.1*, DM.10, DM.2*, DM.3*, PS.3*, PS.4*, PS.7*, PS.9*, PS.10*</p> <p>Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PS.1</p>
Demonstrate critical thinking and problem solving.	<p>English: 6.1, 6.3, 6.4, 6.5, 6.6, 6.7, 6.9, 7.1, 7.3, 7.4, 7.5, 7.6, 7.7, 7.9, 8.1, 8.3, 8.4, 8.5, 8.6, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8</p> <p>History and Social Science: CE.1, CE.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WG.4, WHI.1, WHII.1</p> <p>Mathematics: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.10, 6.11, 7.2, 7.3, 7.8, 7.12, 7.13, 8.2, 8.4, 8.8, 8.9, 8.10, 8.11, A.8, A.9, G.1, G.13, G.14, AFDA.3, AFDA.5, AFDA.8, AII.9, AII.10, AII.11, COM.1, COM.3, COM.4, COM.5, COM.8, DM.4, DM.7, DM.1*, DM.2*, DM.3*, DM.9*, PS.9*, PS.10*</p> <p>Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PS.1</p>
Demonstrate initiative and self-direction.	<p>English: 6.1, 6.4, 6.6, 6.7, 6.9, 7.1, 7.4, 7.6, 7.7, 7.9, 8.1, 8.4, 8.6, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8</p> <p>History and Social Science: CE.1, CE.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1</p>

<b>Task</b>	<b>SOL Correlations</b>
Demonstrate integrity.	English: 6.1, 7.1, 8.1, 9.1, 9.5, 10.1, 10.5, 11.1, 11.5, 12.1, 12.5 History and Social Science: CE.1, CE.3, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrate work ethic.	English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: CH.1
<b>Demonstrating Interpersonal Skills</b>	
Demonstrate conflict-resolution skills.	English: 6.1, 6.2, 6.4, 6.6, 6.7, 6.9, 7.1, 7.2, 7.4, 7.6, 7.7, 7.9, 8.1, 8.2, 8.4, 8.6, 8.7, 8.9, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, VUS.1
Demonstrate listening and speaking skills.	English: 6.1, 6.2, 6.4, 6.6, 7.1, 7.2, 7.4, 7.6, 8.1, 8.2, 8.4, 8.6, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrate respect for diversity.	English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.3, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, USII.9, VUS.1, VUS.13, WG.1, WHI.1, WHII.1
Demonstrate customer service skills.	English: 6.1, 6.4, 6.7, 7.1, 7.4, 7.7, 8.1, 8.4, 8.7, 9.1, 9.5, 9.6, 10.1, 10.5, 10.6, 11.1, 11.5, 11.6, 12.1, 12.5, 12.6 History and Social Science: CE.1, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Collaborate with team members	English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.3, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
<b>Demonstrating Professional Competencies</b>	
Demonstrate big-picture thinking.	English: 6.1, 6.4, 7.1, 7.4, 8.1, 8.4, 9.1, 9.5, 10.1, 10.5, 11.1, 11.5, 12.1, 12.5 History and Social Science: CE.1, CE.4, CE.12, GOVT.1, GOVT.15, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrate career- and life-	English: 6.1, 6.7, 7.1, 7.7, 8.1, 8.7, 9.1, 9.6, 10.1, 10.6, 11.1, 11.6, 12.1, 12.6

Task	SOL Correlations
management skills.	History and Social Science: CE.1, CE.4, CE.12, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 8.4
Demonstrate continuous learning and adaptability.	English: 6.1, 6.4, 6.7, 6.9, 7.1, 7.4, 7.7, 7.9, 8.1, 8.4, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.3, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: BIO.1, CH.1, LS.1, PH.1, PH.4, PS.1
Manage time and resources.	English: 6.1, 6.2, 6.4, 6.7, 6.9, 7.1, 7.2, 7.4, 7.7, 7.9, 8.1, 8.2, 8.4, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.2, 11.5, 11.6, 11.8, 12.2, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.10, 6.11, 6.12, 7.2, 7.3, 7.8, 7.9, 7.10, 7.11, 7.12, 7.13, 8.4, 8.11, 8.12, 8.13, 8.14, 8.17, 8.18, A.4, A.5, A.8, A.9, AFDA.3, AFDA.4, AFDA.5, AFDA.6, AFDA.7, AFDA.8, COM.1, COM.3, COM.5, COM.8
Demonstrate information-literacy skills.	English: 6.1, 6.2, 6.4, 6.6, 6.7, 6.9, 7.1, 7.2, 7.3, 7.4, 7.6, 7.7, 7.9, 8.1, 8.2, 8.3, 8.4, 8.6, 8.7, 8.9, 9.2, 9.5, 9.6, 9.8, 10.2, 10.5, 10.6, 10.8, 11.2, 11.5, 11.6, 11.8, 12.2, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.10, 6.11, 7.8, 7.9, 8.11, 8.12, A.8, A.9, AFDA.3, AFDA.4, AFDA.6, AFDA.7, AFDA.8, DM.8, PS.1*, PS.2*, PS.3*, PS.4*, PS.7*, PS.8*, PS.9*, PS.10* Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PH.1, PS.1
Demonstrate an understanding of information security.	English: 6.1, 6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 7.1, 7.2, 7.3, 7.4, 7.6, 7.7, 7.8, 7.9, 8.1, 8.2, 8.3, 8.4, 8.6, 8.7, 8.8, 8.9, 9.1, 9.2, 9.5, 9.6, 9.8, 10.1, 10.2, 10.5, 10.6, 10.8, 11.1, 11.2, 11.5, 11.6, 11.8, 12.1, 12.2, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: COM.10
Maintain working knowledge of current information-technology	English: 6.1, 6.3, 6.4, 6.6, 6.9, 7.1, 7.3, 7.4, 7.6, 7.9, 8.1, 8.3, 8.4, 8.6, 8.9 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1,

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(IT) systems.	WHII.1 Mathematics: 7.8, COM.1, COM.2, COM.7, COM.9, COM.10, COM.11, COM.16, COM.18, PS.17 Science: BIO.1, CH.1, ES.1, PH.1
Demonstrate proficiency with technologies, tools, and machines common to a specific occupation.	History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.10, 6.11, 7.9, 8.4, A.7, A.8, A.9, AFDA.1, AFDA.3, AFDA.5, AII.4, AII.7, AII.9, COM.1, COM.7, COM.10, COM.11, COM.12, COM.16 Science: CH.1, ES.1, LS.1, PH.1, PS.1
Apply mathematical skills to job-specific tasks.	English: 6.4, 6.6, 6.7, 7.4, 7.6, 7.7, 8.4, 8.6, 8.7, 9.5, 9.6, 10.5, 10.6, 11.5, 11.6, 12.5, 12.6 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.1, 6.2, 6.5, 6.6, 6.12, 6.13, 6.14, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.8, 7.9, 7.11, 7.12, 7.13, 8.4, 8.5, 8.6, 8.8, 8.9, 8.10, 8.11, 8.12, 8.13, 8.14, 8.15, 8.16, 8.17, 8.18, A.1, A.3, A.4, A.5, A.7, A.8, A.9, AFDA.1, AFDA.3, AFDA.5, AFDA.8, AII.3, AII.7, AII.9, AII.10, COM.1, COM.7 Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PH.1, PS.1
Demonstrate professionalism.	English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrate reading and writing skills.	English: 6.1, 6.6, 6.7, 7.1, 7.6, 7.7, 8.1, 8.6, 8.7, 9.1, 9.5, 9.6, 9.7, 10.1, 10.5, 10.6, 10.7, 11.1, 11.5, 11.6, 11.7, 12.1, 12.5, 12.6, 12.7 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: 6.1, PH.1, PS.1
Demonstrate workplace safety.	English: 6.4, 7.4, 8.4, 9.5, 10.5, 11.5, 12.5 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: CH.1
<b>Examining All Aspects of an Industry</b>	
Examine aspects of planning	History and Social Science: GOVT.16

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within an industry/organization.	
Examine aspects of management within an industry/organization.	
Examine aspects of financial responsibility within an industry/organization.	
Examine technical and production skills required of workers within an industry/organization.	
Examine principles of technology that underlie an industry/organization.	
Examine labor issues related to an industry/organization.	History and Social Science: GOVT.16
Examine community issues related to an industry/organization.	History and Social Science: GOVT.16
Examine health, safety, and environmental issues related to an industry/organization.	History and Social Science: GOVT.16
<b>Addressing Elements of Student Life</b>	
Identify the purposes and goals of the student organization.	
Explain the benefits and	

Task	SOL Correlations
responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.	
Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects.	
Identify Internet safety issues and procedures for complying with acceptable use standards.	
<b>Exploring Work-Based Learning</b>	
Identify the types of work-based learning (WBL) opportunities.	
Reflect on lessons learned during the WBL experience.	
Explore career opportunities related to the WBL experience.	
Participate in a WBL experience, when appropriate.	
<b>Exploring Foundations in Biotechnology</b>	
Define <i>biotechnology</i> .	<p>English: 10.3, 11.3, 12.3</p> <p>History and Social Science: VUS.14, WG.17, WHII.14</p> <p>ITEEA National Standards: 1. The Characteristics and Scope of Technology</p>

Task	SOL Correlations
	<p>15. Agricultural and Related Biotechnologies 3. The Relationships Among Technologies and the Connections Between Technology and Other Fields</p> <p>TSA Competitive Events: Biotechnology Design Technology Bowl (Written and Oral)</p>
Give examples of biotechnology milestones.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: GOVT.13, VUS.13, VUS.14, WG.7, WG.8, WG.10, WG.11, WG.12, WHIL.6, WHIL.8</p> <p>ITEEA National Standards: 7. The Influence of Technology on History</p> <p>TSA Competitive Events: Biotechnology Design</p>
Describe social implications of biotechnology.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: GOVT.9, GOVT.15, VUS.13, VUS.14, WG.6, WHIL.13, WHIL.14</p> <p>Mathematics: PS.1*, PS.7*, PS.11*</p> <p>Science: BIO.5</p> <p>ITEEA National Standards: 4. The Cultural, Social, Economic, and Political Effects of Technology</p> <p>TSA Competitive Events: Biotechnology Design Engineering Design</p>

Task	SOL Correlations
	Essays on Technology
Describe technology transfer in biotechnology.	<p>History and Social Science: VUS.13, VUS.14</p> <p>ITEEA National Standards: 3. The Relationships Among Technologies and the Connections Between Technology and Other Fields</p> <p>TSA Competitive Events: Biotechnology Design Engineering Design</p>
Identify careers related to biotechnology.	<p>English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8</p> <p>ITEEA National Standards: 1. The Characteristics and Scope of Technology 10. The Role of Troubleshooting, Research and Development, Invention and Innovation, and Experimentation in Problem Solving 4. The Cultural, Social, Economic, and Political Effects of Technology 7. The Influence of Technology on History</p> <p>TSA Competitive Events: Biotechnology Design Digital Video Production Engineering Design</p>
<b>Preparing for Biotechnology Experiences</b>	
Demonstrate understanding of required safety practices and procedures in the classroom and laboratory environment.	<p>History and Social Science: VUS.8, VUS.13, VUS.14, WHIL.8</p> <p>Science: BIO.1, CH.1</p> <p>ITEEA National Standards: 12. Use and Maintain Technological Products and Systems</p>



Task	SOL Correlations
	14. Medical Technologies 15. Agricultural and Related Biotechnologies  TSA Competitive Events: Biotechnology Design
Use the scientific method and the technological/engineering method to solve biotechnology problems.	English: 10.3, 10.5, 10.8, 11.3, 11.5, 11.8, 12.3, 12.5, 12.8  History and Social Science: WHII.4  Mathematics: A.8, A.9, AFDA.3, AFDA.8, AII.9, PS.1*, PS.2*, PS.3*, PS.4*, PS.8*, PS.10*  Science: BIO.1, CH.1, PH.3, PH.4  ITEEA National Standards: 11. Apply the Design Processes 8. The Attributes of Design  TSA Competitive Events: Engineering Design Scientific and Technical Visualization (SciVis)
Analyze data generated from lab activities.	English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8  History and Social Science: WHII.4  Mathematics: A.4, A.8, A.9, AFDA.3, AFDA.8, AII.3, AII.9, PS.1*, PS.2*, PS.3*, PS.4*, PS.8*  Science: BIO.1, CH.1, PH.3  TSA Competitive Events: Biotechnology Design

Task	SOL Correlations
	Engineering Design
<b>Exploring Biochemistry</b>	
Explain the roles of sciences applicable to biotechnology, including organic chemistry, biochemistry, and microbiology.	<p>English: 10.5, 11.5, 12.5</p> <p>Science: BIO.2, CH.6</p> <p>ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies</p> <p>TSA Competitive Events: Biotechnology Design Technology Bowl (Written and Oral)</p>
Prepare buffer stock solutions and reagents.	<p>Mathematics: A.1, A.4, AII.3</p> <p>Science: CH.4</p> <p>ITEEA National Standards: 14. Medical Technologies</p>
Explain the structure and cellular function of organic macromolecules.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: WHII.4</p> <p>Science: BIO.2</p> <p>ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies 3. The Relationships Among Technologies and the Connections Between Technology and Other Fields</p>

Task	SOL Correlations
	TSA Competitive Events: Biotechnology Design Essays on Technology Extemporaneous Presentation
Analyze how organic macromolecules are manipulated and detected, using biotechnological tools.	English: 10.5, 11.5, 12.5  Science: BIO.1  ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies 3. The Relationships Among Technologies and the Connections Between Technology and Other Fields  TSA Competitive Events: Biotechnology Design Essays on Technology Extemporaneous Presentation
Explain the function of carbohydrates and lipids.	English: 10.5, 11.5, 12.5  Science: BIO.2  ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies  TSA Competitive Events: Technology Bowl (Written and Oral)
Combine several separate	English: 10.5, 11.5, 12.5

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shapefiles and attribute tables into one file.	<p>ITEEA National Standards:  14. Medical Technologies  15. Agricultural and Related Biotechnologies  3. The Relationships Among Technologies and the Connections Between Technology and Other Fields</p> <p>TSA Competitive Events:  Biotechnology Design  Essays on Technology  Extemporaneous Presentation</p>
Differentiate among the types of proteins found in organisms.	<p>English: 10.5, 11.5, 12.5</p> <p>Science: BIO.5</p> <p>ITEEA National Standards:  12. Use and Maintain Technological Products and Systems  13. Assess the Impact of Products and Systems</p> <p>TSA Competitive Events:  Biotechnology Design</p>
Explain the basic principles of protein utilization in organisms.	<p>English: 10.5, 11.5, 12.5</p> <p>Mathematics: AFDA.1, AFDA.3, AII.7, AII.9, PS.8*, PS.11*</p> <p>Science: BIO.4, BIO.7, BIO.8</p> <p>ITEEA National Standards:  14. Medical Technologies  15. Agricultural and Related Biotechnologies</p>

Task	SOL Correlations
Explain the advantages of protein utilization in organisms.	<p>TSA Competitive Events: Technology Bowl (Written and Oral)</p> <p>English: 10.5, 11.5, 12.5</p> <p>Science: BIO.2, CH.6</p> <p>ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies</p> <p>TSA Competitive Events: Biotechnology Design</p>
Illustrate the function or use of an enzyme, using a prototype or model.	<p>Science: BIO.2</p> <p>ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies</p> <p>TSA Competitive Events: Biotechnology Design</p>
<b>Investigating Genetic Engineering</b>	
Define <i>genetic engineering</i> .	<p>English: 10.3, 11.3, 12.3</p> <p>History and Social Science: VUS.14, WG.17, WHII.14</p> <p>Science: BIO.5</p> <p>ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies</p>

Task	SOL Correlations
	<p>3. The Relationships Among Technologies and the Connections Between Technology and Other Fields</p> <p>TSA Competitive Events: Biotechnology Design Technology Bowl (Written and Oral)</p>
Develop a timeline of genetic engineering milestones.	<p>English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8</p> <p>History and Social Science: GOVT.9, GOVT.15, VUS.3, VUS.6, VUS.13, VUS.14, WHI.1, WHI.2, WHI.3, WHI.4, WHI.5, WHI.8, WHI.9, WHI.11, WHI.12, WHI.13, WHII.1, WHII.2, WHII.5, WHII.6, WHII.7, WHII.13, WHII.14</p> <p>Science: BIO.1, BIO.5</p> <p>ITEEA National Standards: 6. The Role of Society in the Development and Use of Technology 7. The Influence of Technology on History</p> <p>TSA Competitive Events: Biotechnology Design Essays on Technology</p>
Model deoxyribonucleic acid (DNA).	<p>History and Social Science: WHII.4</p> <p>Science: BIO.5</p> <p>ITEEA National Standards: 14. Medical Technologies</p> <p>TSA Competitive Events: Biotechnology Design</p>

Task	SOL Correlations
Assess the importance of the genetic information contained in DNA.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: VUS.14, WG.17, WHII.14</p> <p>Science: BIO.5</p> <p>ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies</p> <p>TSA Competitive Events: Essays on Technology</p>
Describe the function of DNA, ribonucleic acid (RNA), and protein in living cells.	<p>History and Social Science: WHII.4</p> <p>Science: BIO.5</p> <p>ITEEA National Standards: 14. Medical Technologies</p> <p>TSA Competitive Events: Biotechnology Design</p>
Demonstrate how the structure of DNA influences its function, analysis, and manipulation.	<p>History and Social Science: WHII.4</p> <p>Science: BIO.5</p> <p>ITEEA National Standards: 14. Medical Technologies</p> <p>TSA Competitive Events: Biotechnology Design</p>

Task	SOL Correlations
Demonstrate how manipulation of nucleic acids through genetic engineering alters the function of proteins and subsequent cellular processes.	<p>Science: BIO.1, BIO.5</p> <p>ITEEA National Standards:  11. Apply the Design Processes  12. Use and Maintain Technological Products and Systems  14. Medical Technologies</p>
Explain how genetic engineering is used in plants, animals, and medicine.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: VUS.14, WG.17, WHII.14</p> <p>ITEEA National Standards:  14. Medical Technologies  15. Agricultural and Related Biotechnologies  6. The Role of Society in the Development and Use of Technology</p> <p>TSA Competitive Events:  Biotechnology Design  Essays on Technology  Extemporaneous Presentation</p>
Explain the importance of genetic mapping.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: VUS.14, WG.17, WHII.14</p> <p>Science: BIO.5</p> <p>ITEEA National Standards:  14. Medical Technologies  3. The Relationships Among Technologies and the Connections Between Technology and Other Fields</p> <p>TSA Competitive Events:</p>



Task	SOL Correlations
<p>Analyze social implications of genetic engineering.</p>	<p>Digital Video Production Technology Bowl (Written and Oral)</p> <p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: GOVT.9, GOVT.15, VUS.3, VUS.6, VUS.13, VUS.14, WHII.13, WHII.14</p> <p>ITEEA National Standards: 14. Medical Technologies 3. The Relationships Among Technologies and the Connections Between Technology and Other Fields</p> <p>TSA Competitive Events: Engineering Design Essays on Technology</p>
<b>Applying Biotechnology to the Environment</b>	
<p>Assess the social implication of environmental quality management.</p>	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: GOVT.9, GOVT.15, VUS.3, VUS.6, VUS.13, VUS.14, WHII.13, WHII.14</p> <p>ITEEA National Standards: 4. The Cultural, Social, Economic, and Political Effects of Technology</p> <p>TSA Competitive Events: Digital Video Production Engineering Design</p>
<p>Investigate biotreatment systems.</p>	<p>English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8</p> <p>History and Social Science: VUS.14, WG.17, WHII.14</p>

Task	SOL Correlations
	<p>ITEEA National Standards: 1. The Characteristics and Scope of Technology</p> <p>TSA Competitive Events: Technology Bowl (Written and Oral)</p>
Examine the potential benefits of biological controls in plant and animal systems.	<p>English: 10.5, 11.5, 12.5</p> <p>ITEEA National Standards: 10. The Role of Troubleshooting, Research and Development, Invention and Innovation, and Experimentation in Problem Solving 5. The Effects of Technology on the Environment</p> <p>TSA Competitive Events: Biotechnology Design</p>
Design a bioremediation system.	<p>English: 10.1, 10.5, 10.6, 10.7, 11.1, 11.5, 11.6, 11.7, 12.1, 12.5, 12.6, 12.7</p> <p>History and Social Science: VUS.14, WG.17, WHII.14</p> <p>Science: BIO.1</p> <p>ITEEA National Standards: 1. The Characteristics and Scope of Technology</p> <p>TSA Competitive Events: Biotechnology Design Engineering Design</p>
Plan a bio restoration system.	<p>English: 10.1, 10.5, 10.6, 10.7, 11.1, 11.5, 11.6, 11.7, 12.1, 12.5, 12.6, 12.7</p>

Task	SOL Correlations
	<p>History and Social Science: VUS.14, WG.17, WHIL.14</p> <p>Science: BIO.1</p> <p>ITEEA National Standards: 8. The Attributes of Design</p> <p>TSA Competitive Events: Biotechnology Design Engineering Design</p>
<p>Demonstrate the use of biotechnology to restore or remediate contaminated environments.</p>	<p>History and Social Science: VUS.14, WG.17, WHIL.14</p> <p>ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies 5. The Effects of Technology on the Environment</p> <p>TSA Competitive Events: Biotechnology Design</p>
<b>Examining the Role of Biotechnology in Agriculture</b>	
<p>Demonstrate various procedures used with tissue cultures.</p>	<p>ITEEA National Standards: 10. The Role of Troubleshooting, Research and Development, Invention and Innovation, and Experimentation in Problem Solving</p>
<p>Analyze social implications of biotechnology in agriculture.</p>	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: GOVT.9, GOVT.15, VUS.13, VUS.14, WG.14, WG.15, WG.17, WHIL.13, WHIL.14</p> <p>ITEEA National Standards: 4. The Cultural, Social, Economic, and Political Effects of Technology</p>

Task	SOL Correlations
	TSA Competitive Events: Biotechnology Design Essays on Technology
Identify microbial applications in agriculture.	English: 10.5, 11.5, 12.5  ITEEA National Standards: 15. Agricultural and Related Biotechnologies  TSA Competitive Events: Biotechnology Design
Summarize the role of biotechnology in crop modification.	English: 10.5, 11.5, 12.5  History and Social Science: VUS.14, WG.17, WHII.14  Science: BIO.5, BIO.7  ITEEA National Standards: 3. The Relationships Among Technologies and the Connections Between Technology and Other Fields  TSA Competitive Events: Biotechnology Design
Identify factors that jeopardize food safety.	English: 10.5, 11.5, 12.5  ITEEA National Standards: 12. Use and Maintain Technological Products and Systems
Examine advances of biotechnology in food science.	History and Social Science: WHI.3, WHI.12  ITEEA National Standards:

Task	SOL Correlations
	<p>15. Agricultural and Related Biotechnologies</p> <p>TSA Competitive Events:            Biotechnology Design            Digital Video Production            Essays on Technology</p>
<b>Exploring Bioprocessing</b>	
Define <i>bioprocessing</i> .	<p>English: 10.3, 11.3, 12.3</p> <p>History and Social Science: VUS.14, WG.17, WHII.14</p> <p>ITEEA National Standards:            14. Medical Technologies            15. Agricultural and Related Biotechnologies            3. The Relationships Among Technologies and the Connections Between Technology and Other Fields</p> <p>TSA Competitive Events:            Biotechnology Design            Technology Bowl (Written and Oral)</p>
Describe the process of fermentation.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: WHI.3, WHI.4</p> <p>Science: BIO.2</p> <p>ITEEA National Standards:            15. Agricultural and Related Biotechnologies</p> <p>TSA Competitive Events:</p>

Task	SOL Correlations
Prepare a product generated from bioprocessing.	Biotechnology Design Technology Bowl (Written and Oral)  History and Social Science: VUS.14, WG.17, WHIL.14  ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies  TSA Competitive Events: Biotechnology Design Engineering Design Manufacturing Prototype
Describe genetic engineering applications used in bioprocessing.	English: 10.5, 11.5, 12.5  History and Social Science: VUS.14, WG.17, WHIL.14  Science: BIO.5  ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies  TSA Competitive Events: Biotechnology Design Engineering Design Scientific and Technical Visualization (SciVis) Technology Bowl (Written and Oral)
Demonstrate the application of microbes in bioprocessing.	ITEEA National Standards: 15. Agricultural and Related Biotechnologies

Task	SOL Correlations
Describe the social and environmental effects of bioprocessing.	<p>TSA Competitive Events: Biotechnology Design</p> <p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: GOVT.9, GOVT.15, VUS.13, VUS.14, WG.14, WG.15, WG.17, WHIL.13, WHIL.14</p> <p>ITEEA National Standards: 4. The Cultural, Social, Economic, and Political Effects of Technology 5. The Effects of Technology on the Environment</p> <p>TSA Competitive Events: Biotechnology Design</p>
Perform separation and purification techniques.	<p>Science: CH.1</p> <p>ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies</p> <p>TSA Competitive Events: Biotechnology Design</p>
Illustrate the design of bioprocessing systems.	<p>ITEEA National Standards: 11. Apply the Design Processes 8. The Attributes of Design</p> <p>TSA Competitive Events: Biotechnology Design Engineering Design</p>
<b>Examining the Role of Biotechnology in Medicine</b>	

Task	SOL Correlations
Identify the influence of biotechnology on medicine.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: GOVT.9, GOVT.15, VUS.13, VUS.14, WHIL.13, WHIL.14</p> <p>ITEEA National Standards: 13. Assess the Impact of Products and Systems 14. Medical Technologies</p> <p>TSA Competitive Events: Technology Bowl (Written and Oral)</p>
Describe the ethical, legal, and social implications of biomedicine.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: GOVT.9, GOVT.15, VUS.13, VUS.14, WHIL.13, WHIL.14</p> <p>ITEEA National Standards: 4. The Cultural, Social, Economic, and Political Effects of Technology</p> <p>TSA Competitive Events: Essays on Technology</p>
Explain vaccine (i.e., immunology) research and development.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: VUS.8, VUS.13, VUS.14, WG.17, WHIL.8, WHIL.14</p> <p>Science: BIO.3</p> <p>ITEEA National Standards: 14. Medical Technologies 3. The Relationships Among Technologies and the Connections Between Technology and Other Fields</p> <p>TSA Competitive Events:</p>



Task	SOL Correlations
	Essays on Technology Technology Bowl (Written and Oral)
Describe the effects of molecular research on society.	English: 10.5, 11.5, 12.5  History and Social Science: GOVT.9, GOVT.15, VUS.13, VUS.14, WHII.13, WHII.14  Science: BIO.5  ITEEA National Standards: 13. Assess the Impact of Products and Systems 14. Medical Technologies 15. Agricultural and Related Biotechnologies
Identify emerging healthcare technologies.	English: 10.5, 11.5, 12.5  History and Social Science: GOVT.9, GOVT.15, VUS.3, VUS.6, VUS.13, VUS.14, WHII.13, WHII.14  ITEEA National Standards: 14. Medical Technologies 6. The Role of Society in the Development and Use of Technology
Explain the applications of genetics in pharmacology.	English: 10.5, 11.5, 12.5  Science: BIO.5  ITEEA National Standards: 3. The Relationships Among Technologies and the Connections Between Technology and Other Fields
Describe the effects of biotechnology on preventive healthcare.	English: 10.5, 11.5, 12.5  History and Social Science: GOVT.9, GOVT.15, VUS.13, VUS.14, WHII.13, WHII.14

Task	SOL Correlations
	<p>ITEEA National Standards:  13. Assess the Impact of Products and Systems  4. The Cultural, Social, Economic, and Political Effects of Technology  5. The Effects of Technology on the Environment</p> <p>TSA Competitive Events:  Digital Video Production</p>
<b>Investigating Forensics</b>	
Define <i>forensic science</i> .	<p>English: 10.3, 10.5, 11.3, 11.5, 12.3, 12.5</p> <p>History and Social Science: VUS.14, WG.17, WHII.14</p> <p>Science: BIO.5</p> <p>ITEEA National Standards:  1. The Characteristics and Scope of Technology  14. Medical Technologies  15. Agricultural and Related Biotechnologies  3. The Relationships Among Technologies and the Connections Between Technology and Other Fields</p> <p>TSA Competitive Events:  Biotechnology Design  Technology Bowl (Written and Oral)</p>
Describe situations in which medical forensics can be used.	<p>English: 10.5, 11.5, 12.5</p> <p>ITEEA National Standards:  14. Medical Technologies</p>
Describe situations in which	English: 10.5, 11.5, 12.5

Task	SOL Correlations
forensic science can be used in criminal investigations.	ITEEA National Standards: 14. Medical Technologies
Describe situations in which biological forensic science can be used.	English: 10.5, 11.5, 12.5  ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies
Demonstrate the basic instrumentation used in DNA analysis for forensic purposes.	English: 10.5, 11.5, 12.5  ITEEA National Standards: 12. Use and Maintain Technological Products and Systems 2. The Core Concepts of Technology  TSA Competitive Events: Engineering Design
<b>Understanding Biomedical Engineering</b>	
Define <i>bioengineering</i> .	English: 10.3, 10.5, 11.3, 11.5, 12.3, 12.5  History and Social Science: VUS.14, WG.17, WHII.14  ITEEA National Standards: 1. The Characteristics and Scope of Technology 14. Medical Technologies 15. Agricultural and Related Biotechnologies 2. The Core Concepts of Technology 3. The Relationships Among Technologies and the Connections Between Technology and Other Fields  TSA Competitive Events:

Task	SOL Correlations
Identify uses of nanobiotechnology.	<p>Biotechnology Design Technology Bowl (Written and Oral)</p> <p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: VUS.14, WG.17, WHII.14</p> <p>ITEEA National Standards: 6. The Role of Society in the Development and Use of Technology</p> <p>TSA Competitive Events: Biotechnology Design</p>
Identify examples of biowarfare.	<p>History and Social Science: GOVT.9, GOVT.15, VUS.13, VUS.14, WHII.12, WHII.13, WHII.14</p> <p>ITEEA National Standards: 6. The Role of Society in the Development and Use of Technology</p> <p>TSA Competitive Events: Technology Bowl (Written and Oral)</p>
Design and produce a biomechanism.	<p>English: 10.1, 10.5, 10.8, 11.1, 11.5, 11.8, 12.1, 12.5, 12.8</p> <p>History and Social Science: VUS.14, WG.17, WHII.14</p> <p>Science: BIO.1</p> <p>ITEEA National Standards: 11. Apply the Design Processes 12. Use and Maintain Technological Products and Systems</p> <p>TSA Competitive Events:</p>

Task	SOL Correlations
	Biotechnology Design Engineering Design
<b>Examining Social Aspects and Ethics of Biotechnology</b>	
Define <i>bioethics</i> .	<p>English: 10.3, 11.3, 12.3</p> <p>History and Social Science: VUS.14, WG.17, WHII.14</p> <p>ITEEA National Standards: 14. Medical Technologies 15. Agricultural and Related Biotechnologies 6. The Role of Society in the Development and Use of Technology</p> <p>TSA Competitive Events: Biotechnology Design Essays on Technology Extemporaneous Presentation</p>
Assess implications of biotechnology, including gene therapy, patenting of living tissue, and cloning.	<p>History and Social Science: GOVT.1, GOVT.9, GOVT.15, VUS.13, VUS.14, WHII.12, WHII.13, WHII.14</p> <p>Science: BIO.5</p> <p>ITEEA National Standards: 13. Assess the Impact of Products and Systems</p> <p>TSA Competitive Events: Biotechnology Design</p>
Differentiate among ethical principles that reflect social, religious, economic, and political perspectives.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: GOVT.1, GOVT.3, GOVT.9, GOVT.15, GOVT.16</p>

Task	SOL Correlations
	<p>ITEEA National Standards: 4. The Cultural, Social, Economic, and Political Effects of Technology</p> <p>TSA Competitive Events: Essays on Technology</p>
Identify regulations that affect biotechnology.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Science: GOVT.9</p> <p>ITEEA National Standards: 4. The Cultural, Social, Economic, and Political Effects of Technology 6. The Role of Society in the Development and Use of Technology</p> <p>TSA Competitive Events: Essays on Technology</p>