

Standards Correlations

Engineering Studies (8491)

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Demonstrating Personal Qualities and Abilities			
Demonstrate creativity and innovation.	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 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WG.4, WHI.1, WHII.1 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*,		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	PS.3*, PS.4*, PS.7*, PS.9*, PS.10* Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PS.1		
Demonstrate critical thinking and problem solving.	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 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 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* Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PS.1		
Demonstrate initiative and self-direction.	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,		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	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.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1		
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		
Demonstrating Interpersonal Skills			
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		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	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,		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1		
Demonstrating Professional Competencies			
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-management skills.	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 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,		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	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		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	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 (IT) systems.	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,		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	USI.1, USII.1, VUS.1, WG.1, WHI.1, 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,		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	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,		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: CH.1		
Examining All Aspects of an Industry			
Examine aspects of planning within an industry/organization.	History and Social Science: GOVT.16		
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		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
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		
Addressing Elements of Student Life			
Identify the purposes and goals of the student organization.			
Explain the benefits and 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			

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
for complying with acceptable use standards.			
Exploring Work-Based Learning			
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.			
Applying Safety in Engineering Studies			
Demonstrate knowledge of appropriate personal safety procedures.	English: 10.5, 11.5, 12.5 History and Social Sciences: GOVT. 16 Science: CH.1	8P. Apply appropriate methods to diagnose, adjust and repair systems to ensure precise, safe and proper functionality.	

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Comply with safety rules in laboratory activities.	English: 10.5, 11.5, 12.5 History and Social Sciences: GOVT. 16 Science: CH.1	8N. Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.	
Define <i>risk</i> and <i>safety</i> .	English: 10.3, 10.5, 11.3, 11.5, 12.3, 12.5 History and Social Sciences: GOVT. 16	8Q. Synthesize data and analyze trends to make decisions about technological products, systems, or processes. 8R. Interpret the results of technology assessment to guide policy development.	
Examining the Engineering Profession			
Describe how engineering and technology have significantly influenced contemporary society and the environment.	English: 10.5, 11.5, 12.5 History and Social Sciences: WHII.14, VUS.14	5H. Evaluate a technological innovation that arose from a specific society’s unique need or want. 5I. Evaluate a technological innovation that was met with societal resistance impacting its development.	Transportation Modeling Geospatial Technology Principles of Technology (Virginia TSA only)
Research an application of emerging technologies that may have significant influence on contemporary society and the environment.	English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8 History and Social Sciences: WHII.1,14, VUS.1,14	1Q. Conduct research to inform intentional inventions and innovations that address specific needs and wants 4P. Evaluate ways that technology can impact individuals, society, and the environment.	Essays on Technology Prepared Presentation STEM Careers (Virginia TSA only)

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
		<p>4Q. Critique whether existing or proposed technologies use resources sustainably</p> <p>4T. Evaluate how technologies alter human health and capabilities</p>	
Explain how ethical behavior of engineers is essential to the betterment of society.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Sciences: GOVT.16</p>	6H. Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history.	Essays on Technology
Examine how intellectual property is treated in the engineering world.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Sciences: WHII.1, VUS.1, GOVT.1</p>	<p>2Z. Use management processes in planning, organizing, and controlling work</p> <p>8N. Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.</p>	STEM Careers (Virginia TSA only)
Practicing Engineering Fundamentals			
Perform a case study analysis.	<p>English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8</p> <p>History and Social Sciences: WHII.1, VUS.1, GOVT.1</p>	<p>2U. Diagnose a flawed system embedded within a larger technological, social, or environmental system.</p> <p>2Y. Implement quality control as a planned process to ensure that a product, service, or system meets established criteria.</p>	Essays on Technology

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
		<p>4Q. Critique whether existing or proposed technologies use resources sustainably.</p> <p>4S. Develop a solution to a technological problem that has the least negative environmental and social impact.</p> <p>8Q. Synthesize data and analyze trends to make decisions about technological products, systems, or processes</p>	
Communicate engineering ideas using computer applications.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Sciences: WHII.1, VUS.1, GOVT.1</p>	8N. Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems	Engineering Design
Demonstrate research techniques and strategies used by engineers.	<p>English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8</p> <p>History and Social Sciences: WHII.1, VUS.1, GOVT.1</p>	<p>2T. Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making.</p> <p>8Q. Synthesize data and analyze trends to make decisions about technological products, systems, or processes.</p> <p>8R. Interpret the results of technology assessment to guide policy development</p>	<p>Engineering Design</p> <p>Essays in Technology</p>
Evaluate the safety of designs.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Sciences: WHII.1, VUS.1, GOVT.1,16</p>	8P. Apply appropriate methods to diagnose, adjust and repair systems to ensure precise, safe and proper functionality.	Technology Bowl

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Reverse-engineer a product, process, or idea.	English: 10.5, 11.5, 12.5	<p>5J. Design an appropriate technology for use in a different culture</p> <p>7W. Determine the best approach by evaluating the purpose of the design</p> <p>7X. Document trade-offs in the technology and engineering design process to produce the optimal design</p>	Engineering Design
Create an algorithm to solve an engineering problem.	<p>English: 10.3, 10.5, 11.3, 11.5, 12.3, 12.5</p> <p>Mathematics: AII.3</p>	<p>1O. Assess how similarities and differences among scientific, mathematics, engineering, and technological knowledge and skills contributed to the design of a product or system</p> <p>2T. Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making</p> <p>2X. Cite examples of the criteria and constraints of a product or system and how they affect final design</p>	
Demonstrate teamwork skills necessary for success when working in a technological team.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Sciences: GOVT.16</p>	1R. Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system	<p>Engineering Design</p> <p>CAD Engineering</p>

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
		2Z. Use management processes in planning, organizing, and controlling work	
Exploring Mathematics and Science Concepts in Engineering Applications			
Identify physics concepts that are key to designing mechanical systems.	English: 10.3, 10.5, 11.3, 11.5, 12.5, 12.5 Science: PH.3	1O. Assess how similarities and differences among scientific, mathematics, engineering, and technological knowledge and skills contributed to the design of a product or system. 1R. Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system.	Principles of Technology (Virginia TSA only)
Explore physics and mathematical concepts that are key to designing electrical and computer systems.	English: 10.5, 10.8, 11.5, 11.5, 12.5, 12.8 Mathematics: COM.15 Science: PH.8	1O. Assess how similarities and differences among scientific, mathematics, engineering, and technological knowledge and skills contributed to the design of a product or system. 1R. Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system. 2T. Demonstrate the use of conceptual, graphical, virtual, mathematical, and	Principles of Technology (Virginia TSA only)

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
		physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making	
Identify the chemistry concepts that are key to thermodynamic systems.	English: 10.5, 11.5, 12.5 Science: PH.4	<p>1O. Assess how similarities and differences among scientific, mathematics, engineering, and technological knowledge and skills contributed to the design of a product or system.</p> <p>1R. Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system.</p>	Biotechnology Design Geospatial Technology
Identify biology and chemistry concepts that are key to engineered biological and/or environmental systems.	English: 10.5, 11.5, 12.5 Science: BIO.5	<p>1O. Assess how similarities and differences among scientific, mathematics, engineering, and technological knowledge and skills contributed to the design of a product or system.</p> <p>1R. Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system.</p> <p>2U. Diagnose a flawed system embedded within a larger technological, social, or environmental system.</p>	Biotechnology Design Engineering Design

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Applying the Engineering Design Process			
Identify the need for a product or system.	English: 10.3, 10.5, 11.3, 11.5, 12.3, 12.5 History and Social Sciences: WHII.1, VUS.1, GOVT.1	7AA. Illustrate principles, elements, and factors of design.	Biotechnology Design Engineering Design Manufacturing Prototype
Explain the validity of designing alternative solutions to an engineering design problem or challenge.	English: 10.5, 11.5, 12.5	7CC. Apply a broad range of design skills to their design process.	Engineering Design
Identify the specifications of the design problem.	English: 10.5, 11.5, 12.5	4Q. Critique whether existing or proposed technologies use resources sustainably 7W. Determine the best approach by evaluating the purpose of the design 7W. Determine the best approach by evaluating the purpose of the design 7Z. Apply principles of human-centered design 7AA. Illustrate principles, elements, and factors of design	Engineering Design CAD Engineering Manufacturing Prototype

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Generate multiple solutions to the design problem.	English: 10.5, 11.5, 12.5 History and Social Sciences: WHII.1, VUS.1, GOVT.1	4S. Develop a solution to a technological problem that has the least negative environmental and social impact 5J. Design an appropriate technology for use in a different culture 7CC. Apply a broad range of design skills to their design process	Engineering Design CAD Engineering Manufacturing Prototype
Justify an optimal solution to the design problem.	English: 10.5, 11.5, 12.5 History and Social Sciences: WHII.1, VUS.1, GOVT.1	7W. Determine the best approach by evaluating the purpose of the design 7BB. Implement the best possible solution to a design 8P. Apply appropriate methods to diagnose, adjust and repair systems to ensure precise, safe and proper functionality 8Q. Synthesize data and analyze trends to make decisions about technological products, systems, or processes	Engineering Design CAD Engineering Manufacturing Prototype
Create a model or prototype for the chosen solution.	English: 10.5, 10.6, 11.5, 11.6, 12.5, 12.6 History and Social Sciences: WHII.1, VUS.1, GOVT.1 Science: PH.1	2Z. Use management processes in planning, organizing, and controlling work 7DD. Apply a broad range of making skills to their design process	Engineering Design CAD Engineering Manufacturing Prototype Biotechnology Design

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Create a test plan based on specifications.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Sciences: WHIL.1, VUS.1, GOVT.1</p> <p>Science: PH.1</p>	<p>2Y. Implement quality control as a planned process to ensure that a product, service, or system meets established criteria</p> <p>4R. Assess a technology that minimizes resource use and resulting waste to achieve a goal.</p> <p>7W. Determine the best approach by evaluating the purpose of the design</p>	Engineering Design
Test the solution to the design problem.	<p>English: 10.5, 11.5, 12.5</p> <p>Mathematics: AII.3, AII.4, MA.2, MA.4, MA.5, MA.7, MA.10</p> <p>Science: PH.1</p>	<p>2Y. Implement quality control as a planned process to ensure that a product, service, or system meets established criteria</p> <p>4R. Assess a technology that minimizes resource use and resulting waste to achieve a goal.</p> <p>7W. Determine the best approach by evaluating the purpose of the design</p>	<p>Engineering Design</p> <p>CAD Engineering</p> <p>Manufacturing Prototype</p> <p>Biotechnology Design</p>
Evaluate the test results.	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Sciences: WHIL.1, VUS.1, GOVT.1</p> <p>Mathematics: PS.1*, PS.2*, PS.3*, PS.4*, PS.8*, PS.10*, DS.2, DS.7, DS.9*</p> <p>Science: PH.1</p>	<p>3I. Evaluate how technology enhances opportunities for new products and services through globalization</p> <p>4P. Evaluate ways that technology can impact individuals, society, and the environment</p> <p>7W. Determine the best approach by evaluating the purpose of the design</p>	<p>Engineering Design</p> <p>CAD Engineering</p> <p>Manufacturing Prototype</p> <p>Biotechnology Design</p>

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Modify the solution to the design problem, if needed.	English: 10.5, 11.5, 12.5 Science: PH.1	7BB. Implement the best possible solution to a design. 8P. Apply appropriate methods to diagnose, adjust and repair systems to ensure precise, safe and proper functionality	Engineering Design CAD Engineering Manufacturing Prototype Biotechnology Design
Test the modification/alternative solution, if needed.	English: 10.5, 11.5, 12.5 Mathematics: PS.1*, PS.2*, PS.3*, PS.4*, PS.8*, PS.10*, DS.2, DS.7, DS.9* Science: PH.1	2Y. Implement quality control as a planned process to ensure that a product, service, or system meets established criteria 4R. Assess a technology that minimizes resource use and resulting waste to achieve a goal. 7W. Determine the best approach by evaluating the purpose of the design	Engineering Design
Maintain documentation.	English: 10.5, 10.6, 10.7, 11.5, 11.6, 11.7, 12.5, 12.6, 12.7 History and Social Sciences: WHII.1, VUS.1, GOVT.1 Science: PH.1	7X. Document trade-offs in the technology and engineering design process to produce the optimal design	Engineering Design CAD Engineering Manufacturing Prototype Biotechnology Design
Present a solution.	English: 10.5, 11.5, 12.5 History and Social Sciences: WHII.1, VUS.1, GOVT.1	4P. Evaluate ways that technology can impact individuals, society, and the environment 4Q. Critique whether existing or proposed technologies use resources sustainably	Prepared Presentation Engineering Design

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Communicating Fundamental Information			
Communicate with stakeholders to inform requirements.	English: 10.1, 11.1, 12.1 History and Social Sciences: WHII.1, VUS.1, GOVT.1 Mathematics: PS.8*, PS.9*	8N. Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems	
Present an oral technical report on an engineering project.	English: 10.1, 11.1, 12.1 History and Social Sciences: WHII.1, VUS.1, GOVT.1	8N. Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems	Prepared Presentation Extemporaneous Speech
Write a business letter to request information or materials.	English: 10.6, 10.7, 11.6, 11.7, 12.6, 12.7 History and Social Sciences: WHII.1, VUS.1, GOVT.1	8N. Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems	
Identify the different types of models available to engineers.	English: 10.5, 11.5, 12.5 Mathematics: COM.4, COM.6, COM.15	4Q. Critique whether existing or proposed technologies use resources sustainably 7W. Determine the best approach by evaluating the purpose of the design 7CC. Apply a broad range of design skills to their design process	Engineering Design CAD Engineering Manufacturing Prototype Biotechnology Design

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
<p>Explain the benefits and limitations of modeling and simulation.</p>	<p>English: 10.5, 11.5, 12.5</p> <p>History and Social Sciences: WH.1.1, VUS.1, GOVT.1</p>	<p>8Q. Synthesize data and analyze trends to make decisions about technological products, systems, or processes</p> <p>1R. Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system.</p> <p>2U. Diagnose a flawed system embedded within a larger technological, social, or environmental system.</p> <p>4Q. Critique whether existing or proposed technologies use resources sustainably</p> <p>7W. Determine the best approach by evaluating the purpose of the design</p> <p>7CC. Apply a broad range of design skills to their design process</p> <p>8Q. Synthesize data and analyze trends to make decisions about technological products, systems, or processes</p>	<p>Geospatial Technology</p>
<p>Use rapid prototyping to develop models.</p>	<p>English: 10.5, 11.5, 12.5</p>	<p>7BB. Implement the best possible solution to a design.</p> <p>7DD. Apply a broad range of making skills to their design process.</p>	<p>Engineering Design</p> <p>CAD Engineering</p> <p>Manufacturing Prototype</p> <p>Biotechnology Design</p>

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Create a model or simulation for an engineering product, process, or idea.	English: 10.5, 11.5, 12.5	<p>7Z. Apply principles of human-centered design</p> <p>7AA. Illustrate principles, elements, and factors of design</p> <p>7BB. Implement the best possible solution to a design.</p>	<p>Engineering Design</p> <p>CAD Engineering</p> <p>Manufacturing Prototype</p> <p>Biotechnology Design</p>
Exploring Career Opportunities in Engineering			
Explore career opportunities for engineering graduates, both within and outside the field of engineering.	English: 10.5, 10.6, 10.8, 11.5, 11.6, 11.8, 12.5, 12.6, 12.8	<p>6G. Verify that the evolution of civilization has been directly affected by, and has in turn affected, the development and use of tools, materials, and processes.</p> <p>6H. Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history</p>	STEM Careers (Virginia TSA only)
Examine the breadth of topics within an engineering plan of study.	English: 10.5, 11.5, 12.5	<p>6G. Verify that the evolution of civilization has been directly affected by, and has in turn affected, the development and use of tools, materials, and processes.</p> <p>6H. Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history</p>	<p>Engineering Design</p> <p>CAD Engineering</p> <p>Manufacturing Prototype</p> <p>Biotechnology Design</p>

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Participate in a mock interview.	English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8	<p>6G. Verify that the evolution of civilization has been directly affected by, and has in turn affected, the development and use of tools, materials, and processes.</p> <p>6H. Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history</p>	