

Standards Correlations

Modeling and Simulation (8460)

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Demonstrating Personal Qualities and Abilities			
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>		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	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, 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 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		

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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		
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, 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		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
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 (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, 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		

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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		
Examining All Aspects of an Industry			
Examine aspects of planning within an industry/organization.	History and Social Science: GOVT.16		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
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		

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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 for complying with acceptable use standards.			
Exploring Work-based Learning			

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
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.			
Exploring Modeling and Simulation (M&S)			
Describe models and simulations and the relationship between the two.	<p>English: 10.3, 10.5, 11.3, 11.5, 12.3, 12.5</p> <p>Science: PH.1</p> <p>Mathematics: AII.6, AII.7, AII.9, AFDA.2, AFDA.3AFDA.4, AFDA.5, AFDA.6, AFDA.8, COM.2, COM.3, COM.4, COM.7, COM.8, COM.9, OM.10, COM.11, COM.13, COM.14, COM.15, PS.8*, PS.10*, PS.11*, PS.12*, PS.15*, PS.16*, MA.1, MA.2, MA.3, MA.4, MA.5 MA.10</p>	STEL 2, 3	<p>Board Game Design</p> <p>Video Game Design</p>
Describe application domains for M&S activity.	English: 10.1, 10.5, 11.1, 11.5, 12.1, 12.5	STEL 3	<p>Board Game Design</p> <p>Animatronics</p>

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			Geospatial Technology
Explain the history of M&S.	English: 10.5, 11.5, 12.5	STEL6	Technology Bowl
Explain the M&S process and life cycle.	<p>English: 10.1, 10.3, 10.5, 10.8, 11.1, 11.3, 11.5, 11.8, 12.1, 12.3, 12.5, 12.8</p> <p>Science: PH.1</p> <p>Mathematics: AFDA.8, COM.3, COM.5, COM.17, PS.8*</p>	STEL 5	<p>Architectural Design</p> <p>Board Game Design</p> <p>CAD Architecture</p> <p>CAD Engineering</p> <p>Dragster Design</p> <p>Engineering Design</p> <p>Promotional Design</p> <p>Video Game Design</p>

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Identify types of modeling and modeling tools.	<p>English: 10.2, 10.5, 11.2, 11.5, 12.2, 12.5</p> <p>History: WG 17, WHI 1, WHII 14, VUS 14</p> <p>Science: PH.1, PH.2</p>	STEL 8	<p>Board Game Design</p> <p>CAD Architecture</p> <p>CAD Engineering</p> <p>Data Science and Analytics</p> <p>Geospatial Technology</p> <p>Video Game Design</p>
Differentiate the uses of various modeling methods.	<p>English: 10.5, 11.5, 12.5</p> <p>Mathematics: DM.1, DM.2, DM.3, DM.4</p>	STEL 8	Technology Bowl
Identify types of simulation.	English: 10.3, 10.5, 11.3, 11.5, 12.3, 12.5	STEL 8	Technology Bowl
Examine ethical and legal issues in M&S.	<p>English: 10.5, 11.5, 12.5</p> <p>History: Govt 7, 8, 9, 15</p>	STEL 4	<p>Essays on Technology</p> <p>Technology Bowl</p>

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Examine career opportunities in M&S.	English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8	STEL 3	Cybersecurity Software Development Transportation Modeling Data Science and Analytics Geospatial Technology
Learning Technical Skills for M&S			
Describe computer programming tools that can be used to develop models and simulations.	English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8	STEL 8	Technology Bowl Video Game Design
Explain the principles of an object-oriented approach to the design of models and simulations.	English: 10.5, 11.5, 12.5	STEL 7, 8	Technology Bowl
Reverse engineer an existing simulation or	English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8	STEL 8	Data Science and Analytics

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
simulation game to its working components and systems.			Video Game Design
Architect a simulation, using an algorithm, pseudocode, flowchart, decision table, and/or a prototype.	English: 10.5, 11.5, 12.5	STEL 8	CAD Architecture Architecture Design
Create a functional simulation.	English: 10.1, 11.1, 10.5, 11.5, 12.1, 12.5 Science PH.1	STEL 8, 3	CAD Architecture CAD Engineering
Visualizing Data			
Explain data visualization.	English: 10.5, 11.5, 12.5 History: WG 17, WHI 1, WHII 14, VUS 14	STEL 3	Geospatial Technology
Explain techniques for presenting data in a visual format.	English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8 Mathematics: AII.9, COM.14, PS.1*, MA.7	STEL 3	CAD Engineering Geospatial Technology Coding
Create a visual representation of data	English: 10.5, 11.5, 12.5	STEL 8	Geospatial Technology

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
using student-collected data or a simulation model.	Mathematics: AII.9, AFDA.3, AFDA.4, AFDA.8, COM.14, PS.1*, PS.2*, PS.3*, PS.4*, PS.10*, MA.7		
Evaluating Complex Systems			
Explain the nature of complex systems.	English: 10.5, 11.5, 12.5	STEL 2	Essays on Technology
Explain data variables that would be necessary to effectively model a complex system.	English: 10.5, 11.5, 12.5 Mathematics: COM.15, COM.16	STEL 8	Essays on Technology Technology Bowl
Propose models of complex systems.	English: 10.5, 10.6, 11.5, 11.6, 12.5, 12.6		Geospatial Technology
Conduct experiments using developed simulation models.	English: 10.5, 11.5, 12.5 Science: PH.1	STEL 8	Engineering Design
Design a 3D working model, using 3D software.	English: 10.1, 11.1, 12.1 Science: PH.1	STEL 7	CAD Engineering Engineering Design
Analyze the 3D model, using simulation software.	English: 10.3, 10.5, 11.3, 11.5, 12.3, 12.5	STEL 8	CAD Engineering
Verify the model's performance within a	English: 10.5, 11.5, 12.5	STEL 8	Engineering Design

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
simulated environment or system.	Science: PH.1		
Produce a physical model based on requirements from a 3D design.	English: 10.1, 10.5, 11.1, 11.5, 12.1, 12.5	STEL 7, 8	CAD Engineering Engineering Design