

Standards Correlations

Energy and Power (8448, 8495)

Task	SOL Correlations	ITEEA	TSA
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>		

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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, 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,		

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	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		

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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		
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		

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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,		

Task	SOL Correlations	ITEEA	TSA
	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,		

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	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		

Task	SOL Correlations	ITEEA	TSA
	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,		

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	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		
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.			

Task	SOL Correlations	ITEEA	TSA
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		
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.			

Task	SOL Correlations	ITEEA	TSA
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.			
Exploring the History of the Energy Industry			
Develop a timeline of energy innovation throughout history.	English: 11.5, 12.5 Science: ES.6 Social Studies: VUS 8, Govt 9, 12, 15	STEL 6	Technology Bowl
Discuss the history of energy as it pertains to mankind's evolution to modern day sources.	English: 11.1, 12.1 Social Studies: VUS 8	STEL 6, 5	Technology Bowl Children's Stories Technology Bowl
Discuss the United States' history of energy as it relates to modern day sources.	English: 11.1, 12.1 Social Studies: VUS 8, 12, 13, 14; Govt 7, 8, 9, 12, 15	STEL 6	
Research the processes of regulatory compliance.	English: 11.5, 11.8, 12.5, 12.8	STEL 3	

Task	SOL Correlations	ITEEA	TSA
	Social Studies: VUS 8, 14; Govt 7, 8, 9, 12, 15		
Introducing Energy			
Define <i>energy</i> .	English: 11.3, 12.3 Science: PH.7, PH.9, PH.11	STEL 2	Technology Bowl
Describe types of energy and their uses.	English: 11.5, 12.5 Social Studies: VUS 15; Govt 9, 12, 15	STEL 2	Technology Bowl
Describe the flow of energy from source to consumer.		STEL 2	Technology Bowl
Demonstrate the use of tools and procedures common to jobs in energy industries.	English: 11.5, 12.5 Science: PH.6	STEL 8	Principles of Technology (Virginia only event)
Demonstrate the use of instruments to measure units.	English: 11.5, 11.6, 12.5, 12.6 Science: PH.1	STEL 8, 3	Principles of Technology (Virginia only event)
Convert units of measure.	English: 11.5, 12.5 Mathematics: AII.3 Science: PH.1, PH.11, CH.1	STEL 3	Principles of Technology (Virginia only event)
Analyze renewable and non-renewable sources of energy.	English: 11.5, 12.5 Science: ES.6 Social Studies: VUS 14; Govt 9, 12, 15	STEL 2	Debating Technological Issues

Task	SOL Correlations	ITEEA	TSA
Explain energy conversion.	English: 11.5, 12.5 Science: PH.6, ES.6	STEL 2, 8	Children's Stories
Introducing Safety and Regulations in Energy and Power			
Explain the purpose of energy regulation.	English: 11.5, 12.5 Science: ES.6 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15	STEL 5	Technology Bowl
Identify the agencies involved in energy regulation.	English: 11.5, 11.8, 12.5, 12.8 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15	STEL 5	Technology Bowl
Comply with federal, state, and local safety requirements.	English: 11.5, 11.8, 12.5, 12.8 Science: CH.1 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15	STEL 2	
Explain safe working practices around electrical hazards.	English: 11.5, 12.5	STEL 2	Principles of Technology (Virginia only event)
Identify emergency first-aid procedures.	English: 11.5, 12.5 Science: CH.1		
Inspect course-specific hand and power tools to visually identify defects.		STEL 8	

Task	SOL Correlations	ITEEA	TSA
Demonstrate lifting and carrying techniques.	English: 11.5, 12.5		
Report personal injuries and environmental and equipment safety violations to the appropriate authority.	English: 11.5, 12.5		
Earn the OSHA 10 card.	English: 11.5, 12.5 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15		
Pass a safety exam for lab/site safety and the use of tools and equipment, if applicable.	English: 11.5, 12.5	STEL 8	
Identify personal protective equipment (PPE) requirements.		STEL 8	
Demonstrate the use of PPE common in electric power distribution.	English: 11.5, 12.5		
Maintain a safe working environment.	English: 11.5, 12.5	STEL 2	
Apply safety guidelines in appropriate circumstances.	English: 11.5, 11.6, 12.5, 12.6 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15	STEL 2, 8	
Explain safety issues related to natural gas distribution.	English: 11.5, 12.5	STEL 8	
Exploring Sources of Energy			

Task	SOL Correlations	ITEEA	TSA
Describe the procurement and reclamation processes (for each source of energy).	English: 11.3, 11.5, 12.3, 12.5 Science: ES.6, PH.7	STEL 8	
Analyze continuous supply and intermittent supply.	English: 11.5, 12.5 Science: ES.6	STEL 3	Technology Bowl
Explain how oil was created and list its advantages and disadvantages.	English: 11.5, 12.5 Science: ES.6 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15	STEL 3	Technology Bowl
Explain how coal was created and list its advantages and disadvantages.	English: 11.5, 12.5 Science: ES.6 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15	STEL 3	Technology Bowl
Explain how uranium is created and list its advantages and disadvantages.	English: 11.5, 12.5 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15	STEL 3	Technology Bowl
Describe byproduct management associated with the use of each type of energy.	English: 11.5, 12.5	STEL 3	Technology Bowl
Explore advantages and disadvantages of hydroelectric power.	English: 11.5, 12.5 Science: ES.6	STEL 3	Technology Bowl

Task	SOL Correlations	ITEEA	TSA
	Social Studies: VUS 14; Govt 7, 8, 9, 12, 15		
Describe effects on solar photovoltaic performance.	English: 11.5, 12.5 Science: ES.6	STEL 8	Children's Stories
Generating Electricity			
Describe the conversion of energy sources (all sources) to electricity.	English: 11.5, 12.5 Science: PH.7	STEL 2, 8	Technology Bowl
Describe electric power generation equipment and systems.	English: 11.5, 12.5 Science: PH.11	STEL 8	Technology Bowl
Transmitting Electricity			
Describe the electric transmission network or grid.	English: 11.3, 11.5, 12.3, 12.5	STEL 8	Technology Bowl Principles of Technology (Virginia only event)
Distinguish among the various lines used for transmission typical to Virginia.	English: 11.5, 12.5		
Analyze schemes for transmission and grid protection and management.	English: 11.5, 12.5		
Describe the transmission of natural gas.	English: 11.3, 11.5, 12.3, 12	STEL 8	Technology Bowl
Describe distribution of natural gas.	English: 11.5, 12.5	STEL 8	Technology Bowl

Task	SOL Correlations	ITEEA	TSA
			Principles of Technology (Virginia only event)
Describe pipes and pressure used in the transmission of natural gas.	English: 11.5, 12.5	STEL 3, 8	
Analyze schemes for protection and management of pipelines.	English: 11.5, 12.5 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15		
Distributing Electricity and Energy Sources			
Describe the electric distribution network.	English: 11.3, 11.5, 12.3, 12.5	STEL 2, 8	Technology Bowl Principles of Technology (Virginia only event)
Analyze schemes for electric distribution system protection and management.	English: 11.5, 12.5 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15		
Analyze schemes for protection and management of natural gas distribution systems.	English: 11.5, 12.5 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15		
Exploring Energy Consumption			
Describe the different physical units in which energy sources are measured.	English: 11.5, 12.5	STEL 3	Technology Bowl
Explain how different energy sources are compared to each other in one common unit.	English: 11.3, 11.5, 12.3, 2.5		

Task	SOL Correlations	ITEEA	TSA
Compare the percentage of each energy source used in the United States over a period of time.	English: 11.5, 12.5 Mathematics: AFDA.3, PS.3*, PS.4* Social Studies: VUS 14; Govt 7, 8, 9, 12, 15		
Explain different end-user sectors and the percentage of energy used by each.	English: 11.5, 12.5		
Exploring Demand-Side Management and Energy Efficiency			
Describe the sectors that comprise energy demand.	English: 11.5, 12.5 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15	STEL 8	Technology Bowl
Define <i>energy demand</i> .	English: 11.3, 12.3 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15		Technology Bowl
Investigate energy demand in a sector.	English: 11.5, 11.8, 12.5, 12.8 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15		
Define <i>energy efficiency</i> .	English: 11.3, 12.3	STEL 3	Technology Bowl
Keep a personal energy log.	English: 11.6, 11.7, 12.6, 12.7		
Identify the components of energy demand.	English: 11.5, 12.5 Social Studies: VUS 14; Govt 7, 8, 9, 12, 15		Technology Bowl

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Preparing for Careers in the Energy Industry			
Examine jobs related to energy.	English: 11.5, 11.8, 12.5, 12.8	STEL 3	
Participate in a mock interview.	English: 11.5, 12.5		Extemporaneous Presentation
Prepare a résumé or portfolio.	English: 11.6, 11.7, 12.6, 12.7	STEL 3	STEM Careers