

Standards Correlations

Principles of Technology I (9811)

Task	SOL Correlations	CTSO 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*, 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,	

Task	SOL Correlations	CTSO Correlations
	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, 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	

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	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	
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	

Task	SOL Correlations	CTSO Correlations
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	

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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	
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	

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	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	
Examine aspects of management within an industry/organization.		
Examine aspects of financial responsibility		

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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	
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.		

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Identify Internet safety issues and procedures 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.		
UNIT 1: FORCE		
Differentiate between scalar and vector.	English: 10.5, 11.5, 12.5 Mathematics: MA.7, MA.11 Science: PH.5	ITEEA: 8 TSA: Principles of Technology (VA only event), Technology Bowl
Define <i>force</i> in general and in the context of mechanical, fluid, electrical, and thermal systems.	English: 10.3, 11.3, 12.3 Science: PH.5	ITEEA: 2, 3 TSA: Principles of Technology (VA only event), Technology Bowl
Give examples of complex technological devices where force must be controlled, measured, or applied.	English: 10.5, 11.5, 12.5 Science: PH.5	ITEEA: 3 TSA: Principles of Technology (VA only event)
Calculate force, pressure, voltage, and temperature difference.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.5, PH.1	ITEEA: 3 TSA: Principles of Technology (VA only event)

Task	SOL Correlations	CTSO Correlations
Predict what happens to an object when forces on it are balanced and when forces on it are unbalanced.	English: 10.5, 11.5, 12.5 Mathematics: MA. 7 Science: PH.5	ITEEA: 2, 3 TSA: Principles of Technology (VA only event)
Measure force in mechanical, fluid, electrical, and thermal systems.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.5, PH.7	ITEEA: 3, 8 TSA: Principles of Technology (VA only event), Technology Bowl
Research occupations that require technicians to measure, control, or otherwise deal with force in complex devices.	English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8	ITEEA: 3 TSA: Principles of Technology (VA only event), STEM Careers
UNIT 2: WORK		
Define <i>work</i> in general and in mechanical, fluid, and electrical systems.	English: 10.3, 11.3, 12.3 Mathematics: MA.7. MA.11 Science: PH.5	ITEEA: 2, 3 TSA: Technology Bowl
Compare the presence of force and movement in mechanical, fluid, and electrical systems.	English: 10.5, 11.5, 12.5 Science: PH.5, PH.7	TSA: Technology Bowl
Identify the International System of Units (SI) and English units for work in mechanical, fluid, and electrical systems.	English: 10.5, 11.5, 12.5 Mathematics: T.2 Science: PH.5	ITEEA: 2, 3 TSA: Technology Bowl
Demonstrate the effects of work done in mechanical, fluid, and electrical systems.	English: 10.5, 11.5, 12.5 Science: PH.5, PH.7	ITEEA: 8 TSA: Technology Bowl
Measure work in mechanical, fluid, and electrical systems.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.5, PH.7	ITEEA: 3, 8 TSA: Principles of Technology (VA only event), Technology Bowl
UNIT 3: RATE		

Task	SOL Correlations	CTSO Correlations
Define <i>rate</i> in general and in mechanical, fluid, electrical, and thermal systems.	English: 10.3, 11.3, 12.3 Mathematics: AII.3, T.2 Science: PH.5, PH.11	ITEEA: 2, 3 TSA: Principles of Technology (VA only event)
Identify the SI and English units for rate in all four energy systems.	English: 10.5, 11.5, 12.5 Mathematics: T.2 Science: PH.5, PH.10	ITEEA: 2, 3 TSA: Principles of Technology (VA only event), Technology Bowl
Calculate rate in mechanical, fluid, electrical, and thermal systems.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.7	ITEEA: 3 TSA: Principles of Technology (VA only event)
Research workplace applications where rate is measured and/or controlled.	English: 10.5, 11.5, 12.5 Science: PH.7	ITEEA: 3 TSA: Principles of Technology (VA only event), STEM Careers
UNIT 4: RESISTANCE		
Define <i>resistance</i> in general and in mechanical, fluid, electrical, and thermal energy systems.	English: 10.3, 11.3, 12.3 Mathematics: AII.3 Science: PH.5	ITEEA: 2, 3 TSA: Principles of Technology (VA only event), Flight Endurance, Technology Bowl
Calculate resistance in each energy system relating to the unifying principle of a “force” divided by a rate.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.5, PH.7	ITEEA: 3, 8 TSA: Principles of Technology (VA only event)
Identify the SI and English units for resistance in each energy system.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.7	ITEEA: 3, 8 TSA: Principles of Technology (VA only event), Technology Bowl
Compare positive and negative effects of resistance in each energy system.	English: 10.5, 11.5, 12.5 Science: PH.5	ITEEA: 8 TSA: Principles of Technology (VA only event), Essays on Technology

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Explain workplace applications where technicians measure or control resistance.	English: 10.5, 11.5, 12.5 Science: PH.5	ITEEA: 3 TSA: STEM Careers
Describe how resistance is affected in thermal systems at extremely high and low temperatures in materials, including superconductors.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.5	ITEEA: 3, 8 TSA: Principles of Technology (VA only event), Biotechnology Design
Measure resistance in mechanical, fluid, electrical, and thermal energy systems.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.5, PH.7	ITEEA: 3, 8 TSA: Biotechnology Design
Construct a system that demonstrates positive vs. negative effects of resistance.	English: 10.5, 11.5, 12.5 Science: PH.5, PH.7	ITEEA: 8 TSA: Computer Integrated Manufacturing (CIM)
UNIT 5: ENERGY		
Define <i>energy</i> in mechanical, fluid, electrical, and thermal systems.	English: 10.3, 11.3, 12.3 Science: PH.6	TSA: Technology Bowl
Demonstrate <i>potential energy</i> .	English: 10.5, 11.5, 12.5 Science: PH.6	ITEEA: 3, 8 TSA: Principles of Technology (VA only event)
Demonstrate <i>kinetic energy</i> .	English: 10.5, 11.5, 12.5 Science: PH.6	ITEEA: 3, 8 TSA: Principles of Technology (VA only event)
Describe the relationship between the law of conservation of energy and potential energy, kinetic energy, and heat energy.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.6	ITEEA: 3 TSA: Biotechnology Design, Technology Bowl
Interpret types of energy conversion in mechanical, thermal, electrical, and fluid systems.	English: 10.5, 11.5, 12.5 Science: PH.7	ITEEA: 3, 8 TSA: Technology Bowl
Describe the relationship between work and energy.	English: 10.5, 11.5, 12.5 Mathematics: AII.3, MA.7	ITEEA: 2, 3 TSA: Technology Bowl

Task	SOL Correlations	CTSO Correlations
	Science: PH.7	
Describe how principles of mechanics apply to celestial systems.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.7	ITEEA: 3 TSA: Biotechnology Design, Technology Bowl
Identify the SI and English units for energy in each system.	English: 10.5, 11.5, 12.5	ITEEA: 3, 8 TSA: Technology Bowl
Calculate energy in each energy system.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.6, PH.7	ITEEA: 3, 8 TSA: Principles of Technology (VA only event)
Research workplaces where technicians measure or control energy.	English: 10.8, 11.8, 12.8	ITEEA: 3 TSA: Prepared Presentation, STEM Careers
UNIT 6: POWER		
Define <i>power</i> in general and in mechanical, fluid, electrical, and thermal systems.	English: 10.3, 11.3, 12.3 Mathematics: AII.3 Science: PH.5	ITEEA: 2, 3 TSA: Technology Bowl
Explain how thermal power and thermal rate are the same.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.5, PH.7	ITEEA: 3 TSA: Technology Bowl
Explain how power in each energy system relates to the unifying principle of work divided by time.	English: 10.5, 11.5, 12.5 Mathematics: AII.3 Science: PH.5	ITEEA: 3 TSA: Technology Bowl
Analyze why power can be described in terms of a force multiplied by a rate for mechanical, fluid, and electrical systems.	English: 10.5, 11.5, 12.5 Mathematics: AII.3, MA.7 Science: PH.5	ITEEA: 3, 8 TSA: Principles of Technology (VA only event)
Research workplace applications where technicians measure or control power.	English: 10.8, 11.8, 12.8	ITEEA: 3 TSA: Essays on Technology, Prepared Presentation, STEM Careers

Task	SOL Correlations	CTSO Correlations
Construct a system that demonstrates the application of power.	English: 10.5, 11.5, 12.5 Mathematics: AII.3, COM.1	ITEEA: 8 TSA: Computer Integrated Manufacturing (CIM)
UNIT 7: FORCE TRANSFORMERS		
Define force transformers in general and in mechanical, fluid, and electrical systems.	English: 10.3, 11.3, 12.3 Science: PH.5	ITEEA: 3, 8 TSA: Principles of Technology (VA only event), Technology Bowl
Evaluate the efficiency of energy conversion, using mathematical calculations.	English: 10.5, 11.5, 12.5 Mathematics: AII.3	ITEEA: 3
Explain why force transformers form a unifying principle in mechanical, fluid, and electrical systems.	English: 10.5, 11.5, 12.5	ITEEA: 3, 8 TSA: Essays on Technology
Research examples of force transformers in mechanical, fluid, and electrical systems.	English: 10.8, 11.8, 12.8	ITEEA: 3 TSA: Principles of Technology (VA only event)
Construct a system that demonstrates the application of force transformers.	English: 10.5, 11.5, 12.5 Mathematics: AFDA.4, AII.6, AII.7, AII.9, MA.1 Science: PH.1, PH.5	ITEEA: 8 TSA: Engineering Design