

Standards Correlations

Materials and Processes Technology (8433 / 8478)

| Task | SOL Correlation | ITEEA National Standards | TSA Competitive Events |
|---|--|--------------------------|------------------------|
| 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> | | |

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| | Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PS.1 | | |
| 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. | 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, | | |

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| | 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 | | |

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| | 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 | | |

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|---|--|--------------------------|------------------------|
| | 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 | | |

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|--|---|--------------------------|------------------------|
| | 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, | | |

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|--|---|--------------------------|------------------------|
| | 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 | | |

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| | 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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| | <p>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</p> <p>Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PH.1, PS.1</p> | | |
| Demonstrate professionalism. | <p>English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1</p> <p>History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1</p> | | |
| Demonstrate reading and writing skills. | <p>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</p> <p>History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1</p> <p>Science: 6.1, PH.1, PS.1</p> | | |

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| 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. | | | |
| Examine principles of technology that underlie an industry/organization. | | | |
| Examine labor issues related to an industry/organization. | History and Social Science: GOVT.16 | | |

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| 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. | | | |
| Exploring Work-Based Learning | | | |

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| 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. | | | |
| Examining Careers and Professional Practices | | | |
| Implement a safety plan that includes safety rules and emergency procedures for lab work. | English: 9.5, 10.5, 11.5 History and Social Science: VUS.8, WHII.8 Science: CH.1 | 12. Use and Maintain Technological Products and Systems | |
| Research careers related to materials and processes. | English: 9.5, 9.8, 10.5, 10.8, 11.5, 11.8 | 2. The Core Concepts of Technology | Career Prep Prepared Presentation |
| Investigate local industry and technical resources related to materials and processes technology. | English: 9.5, 9.8, 10.5, 10.8, 11.5, 11.8 History and Social Science: GOVT.7, WG.5, WG.6, WG.7, WG.8, WG.9, WG.10, WG.11, WG.12, WG.13 Mathematics: PS.1*, PS.8* | 1. The Characteristics and Scope of Technology | Essays on Technology |

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| Identify organizations that develop product and testing standards. | English: 9.5, 10.5, 11.5 | | |
| Research the responsibilities of the members of a project team. | English: 9.5, 9.8, 10.5, 10.8, 11.5, 11.8 History and Social Science: GOVT.1 | 8. The Attributes of Design | |
| Participate in a project team. | English: 9.1, 10.1, 11.1 History and Social Science: GOVT.1 Science: BIO.1, CH.1, PH.1 | 2. The Core Concepts of Technology | Chapter Team |
| Understanding Materials and Processes Technology Concepts | | | |
| Use measuring and layout tools. | Mathematics: G.3, G.14 Science: BIO.1, CH.1, ES.1, PH.1 | 13. Assess the Impact of Products and Systems | Engineering Design |
| List technological and societal developments related to materials and processes technology. | English: 9.6, 9.7, 10.6, 10.7, 11.6, 11.7 History and Social Science: VUS.8, VUS.13, VUS.14, WHI.1, WHI.2, WHI.3, WHI.4, WHI.5, WHI.6, WHI.8, WHII.13, WHII.14 Science: PH.4 | 7. The Influence of Technology on History | |

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| Explain the origin of various natural and synthetic materials. | English: 9.5, 10.5, 11.5 History and Social Science: WHI.2 | 1. The Characteristics and Scope of Technology | |
| Explain the life cycle of a given product and the materials and processes associated with it. | English: 9.5, 10.5, 11.5 History and Social Science: WHI.2, WHI.4 | 3. The Relationships Among Technologies and the Connections Between Technology and Other Fields | |
| Explain the basic structure of atoms and ions. | English: 9.5, 10.5, 11.5 History and Social Science: WHI.8 Science: CH.2, CH.3, CH.4 | 3. The Relationships Among Technologies and the Connections Between Technology and Other Fields | |
| Compare the structure of amorphous and crystalline materials. | English: 9.5, 10.5, 11.5 Science: CH.1, CH.2, CH.3, CH.6, ES.4 | 3. The Relationships Among Technologies and the Connections Between Technology and Other Fields | |
| Distinguish between materials. | English: 9.5, 10.5, 11.5 Science: CH.2 | 19. Manufacturing Technologies | |
| Describe mechanical properties. | English: 9.5, 10.5, 11.5 Mathematics: A.8, AFDA.1, AII.3, AII.7, AII.10 | 13. Assess the Impact of Products and Systems | |
| Perform material analysis using testing devices. | | 13. Assess the Impact of Products and Systems 19. Manufacturing Technologies | |

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|---|---|--|-------------------------------|
| Compare chemical and physical properties of selected materials. | English: 9.5, 10.5, 11.5 Science: CH.2 | 19. Manufacturing Technologies | |
| Research emerging technologies. | English: 9.5, 9.8, 10.5, 10.8, 11.5, 11.8 Science: BIO.1, ES.6 | 1. The Characteristics and Scope of Technology 2. The Core Concepts of Technology 4. The Cultural, Social, Economic, and Political Effects of Technology | |
| Working with Polymers | | | |
| Describe the characteristics and uses of thermoplastics and thermosetting plastics. | English: 9.3, 9.5, 10.3, 10.5, 11.3, 11.5 | 5. The Effects of Technology on the Environment | |
| Select a polymer for a product, based on the properties of the material. | English: 9.5, 10.5, 11.5 Science: CH.6 | 11. Apply the Design Process | |
| Produce polymer items through the use of selected combining techniques. | English: 9.6, 9.7, 10.6, 10.7, 11.6, 11.7 | 19. Manufacturing Technologies | |
| Use separating techniques on polymers. | English: 9.5, 10.5, 11.5 | 19. Manufacturing Technologies | |
| Use forming techniques on polymers. | | 19. Manufacturing Technologies | |
| Produce finished surfaces on polymers. | | 19. Manufacturing Technologies | |

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| Apply polymeric materials and processes to a problem, product design, or prototype. | English: 9.5, 10.5, 11.5 Mathematics: AFDA.8, PS.10* | 11. Apply the Design Process | |
| Working with Metals | | | |
| Describe the basic structure of metals. | English: 9.5, 10.5, 11.5 Science: CH.2 | 19. Manufacturing Technologies | |
| Compare typical properties of selected metals and alloys. | English: 9.5, 10.5, 11.5 Science: CH.2 | 19. Manufacturing Technologies | |
| Perform basic metal-forming techniques. | | 19. Manufacturing Technologies | |
| Perform metal separation processes. | | 19. Manufacturing Technologies | |
| Perform metal combining techniques. | | 19. Manufacturing Technologies | |
| Perform metal finishing techniques. | | 19. Manufacturing Technologies | |
| Apply metal materials and processes to a problem, product design, or prototype. | English: 9.5, 10.5, 11.5 Mathematics: AFDA.8, PS.10* | 11. Apply the Design Process | |
| Working with Wood | | | |
| Describe the nature and structure of wood and forest products. | English: 9.5, 10.5, 11.5 History and Social Science: WG.2, WG.3 | 19. Manufacturing Technologies | |

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| Determine the physical, mechanical, and chemical properties of wood. | English: 9.5, 10.5, 11.5 History and Social Science: WG.1, WG.2, WG.3 Mathematics: PS.2* | 19. Manufacturing Technologies | |
| Use separating techniques on wood. | English: 9.5, 10.5, 11.5 | 19. Manufacturing Technologies | |
| Use wood-combining methods. | English: 9.5, 10.5, 11.5 | 19. Manufacturing Technologies | |
| Apply wood-conditioning materials. | English: 9.5, 10.5, 11.5 | 19. Manufacturing Technologies | |
| Apply wood materials and processes to a problem, product design, or prototype. | English: 9.5, 10.5, 11.5 Mathematics: AFDA.8, PS.10* | 19. Manufacturing Technologies | |
| Working with Ceramics | | | |
| Explain the origin, types, and uses of ceramics. | English: 9.5, 10.5, 11.5 History and Social Science: WHI.4, WHI.5, WHI.6, WHI.8, WHI.11, WHI.5, WHI.6 | 19. Manufacturing Technologies | |
| Classify ceramics, based on their properties. | English: 9.5, 10.5, 11.5 | 19. Manufacturing Technologies | |
| Produce a ceramic part or item. | English: 9.5, 10.5, 11.5 Mathematics: AFDA.8, PS.10* | | |

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| Working with Composites | | | |
| Identify types and applications of composite materials. | English: 9.5, 10.5, 11.5 | 19. Manufacturing Technologies | |
| Produce a composite part or item. | English: 9.5, 10.5, 11.5 Mathematics: AFDA.8, PS.10* | 19. Manufacturing Technologies | Engineering Design |
| Exploring Additive and Subtractive Manufacturing | | | |
| Identify computer-driven additive and subtractive manufacturing processes. | English: 9.5, 10.5, 11.5 History and Social Science: VUS.14, WG.17, WHIL.14 | | |
| Generate models to be converted into machine-compatible digital files. | English: 9.2, 9.5, 10.2, 10.5, 11.2, 11.5 History and Social Science: VUS.14, WG.17, WHIL.14 | | |
| Create a product using computer-driven additive or subtractive processes. | English: 9.5, 10.5, 11.5 History and Social Science: VUS.14, WG.17, WHIL.14 Mathematics: AFDA.8, PS.10* | | |
| Exploring Product Standards | | | |
| Identify services that accredit companies and labs to standard quality systems. | English: 9.5, 10.5, 11.5 | | |

| Task | SOL Correlation | ITEEA National Standards | TSA Competitive Events |
|---|---|---------------------------------|-------------------------------|
| Explain how product standards shape the way raw materials and finished products are manufactured. | English: 9.5, 10.5, 11.5 | | |
| Explain how quality management systems (QMS) shape the way products are manufactured. | English: 9.3, 9.5, 10.3, 10.5, 11.3, 11.5 | | |
| Explain how testing standards help verify product quality. | English: 9.3, 9.5, 10.3, 10.5, 11.3, 11.5 | | |