Virginia CTE

Technology Foundations (8403)

Demonstrating Personal Qualities and Abilities	1. **Demonstrate creativity and innovation.** 8403.1
	2. **Demonstrate critical thinking and problem solving.** 8403.2
	3. **Demonstrate initiative and self-direction.** 8403.3
	4. **Demonstrate integrity.** 8403.4
	5. **Demonstrate work ethic.** 8403.5
Demonstrating Interpersonal Skills	6. **Demonstrate conflict-resolution skills.** 8403.6
	7. **Demonstrate listening and speaking skills.** 8403.7
	8. **Demonstrate respect for diversity.** 8403.8
	9. **Demonstrate customer service skills.** 8403.9
	10. **Collaborate with team members.** 8403.10
Demonstrating Professional Competencies	11. **Demonstrate big-picture thinking.** 8403.11
	12. **Demonstrate career- and life-management skills.** 8403.12
	13. **Demonstrate continuous learning and adaptability.** 8403.13
	14. **Manage time and resources.** 8403.14
	15. **Demonstrate information-literacy skills.** 8403.15
	16. **Demonstrate an understanding of information security.** 8403.16
	17. **Maintain working knowledge of current information-technology (IT) systems.** 8403.17
	18. **Demonstrate proficiency with technologies, tools, and machines common to a specific occupation.** 8403.18
	19. **Apply mathematical skills to job-specific tasks.** 8403.19

	20. **Demonstrate professionalism.** 8403.20
	21. **Demonstrate reading and writing skills.** 8403.21
	22. **Demonstrate workplace safety.** 8403.22
Examining All Aspects of an Industry	23. **Examine aspects of planning within an industry/organization.** 8403.23
	24. **Examine aspects of management within an industry/organization.** 8403.24
	25. **Examine aspects of financial responsibility within an industry/organization.** 8403.25
	26. **Examine technical and production skills required of workers within an industry/organization.** 8403.26
	27. **Examine principles of technology that underlie an industry/organization.** 8403.27
	28. **Examine labor issues related to an industry/organization.** 8403.28
	29. **Examine community issues related to an industry/organization.** 8403.29
	30. **Examine health, safety, and environmental issues related to an industry/organization.** 8403.30
Addressing Elements of Student Life	31. **Identify the purposes and goals of the student organization.** 8403.31
	32. **Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.** 8403.32
	33. **Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects.** 8403.33
	34. **Identify Internet safety issues and procedures for complying with acceptable use standards.** 8403.34
Exploring Work-Based Learning	35. **Identify the types of work-based learning (WBL) opportunities.** 8403.35
	36. **Reflect on lessons learned during the WBL experience.** 8403.36
	37. **Explore career opportunities related to the WBL experience.** 8403.37
	38. **Participate in a WBL experience, when appropriate.** 8403.38
Exploring Technology Foundations	39. **Define technology.** 8403.39

	40. Explain the characteristics and scope of technology. 8403.40
	41. Identify the core concepts of technology. 8403.41
	42. Describe the basic systems model. 8403.42
	43. Distinguish between an open- and closed-loop system. 8403.43
	44. Explain how systems may have varying outputs. 8403.44
	45. List technological resources and their function in a system. 8403.45
	46. Explain what process does in a system. 8403.46
	47. Identify the seven resources for a particular technological system. 8403.47
	48. Describe an engineering design process that is used to design a product. 8403.48
	49. Identify common technological processes that convert materials or energy to produce an output or solution. 8403.49
	50. Describe the core areas of STEM. 8403.50
	51. Use the Pythagorean theorem during a problem-solving activity 8403.51
	52. Identify career opportunities in a variety of technological contexts. 8403.52
Understanding Technological Systems	**53.** Illustrate the concept of a technological system. 8403.53
	54. Distinguish between a system and a subsystem. 8403.54
	55. Analyze the effects of technological systems on society and the environment. 8403.55
Analyzing Consumer Products	**56.** Define consumer. 8403.56
	57. Explain how human factors engineering applies to product design. 8403.57
	58. Describe ways consumer products have shaped society and the environment. 8403.58
	59. Select a consumer product to analyze. 8403.59
	60. Collect product data. 8403.60
	61. Reverse engineer a product. 8403.61
	62. Analyze how a product works, using mathematical and scientific concepts. 8403.62

	63. **Describe an innovation that would improve a product.** 8403.63
	64. **Draw illustrations of an improved product.** 8403.64
	65. **Construct models of an improved product.** 8403.65
	66. **Represent 3D objects on a two-dimensional surface.** 8403.66
	67. **Create a display or multimedia presentation of an improved product, emphasizing STEM concepts.** 8403.67
	68. **Present recorded information about a product using multimedia.** 8403.68
Using Materials as a Technological Resource	69. **Classify materials as either natural or synthetic.** 8403.69
	70. **Classify materials according to the major types.** 8403.70
	71. **Explain how material resources are processed.** 8403.71
	72. **Create a detailed diagram for producing a designed product/model/prototype.** 8403.72
	73. **Use tools, machines, and processes to change materials to produce a designed product.** 8403.73
	74. **Select the best material for a specific design application.** 8403.74
	75. **Predict the outcomes of some technological processes.** 8403.75
	76. **Develop a design using recycled materials.** 8403.76
Using Energy as a Technological Resource	77. **Identify the two types of energy.** 8403.77
	78. **Analyze forms of energy.** 8403.78
	79. **Identify the sources of energy used with technological devices.** 8403.79
	80. **Model the use of energy with mechanical, electrical, fluidic, and thermal systems.** 8403.80
	81. **Map the path of current and emerging energy supplies from their source to end-users.** 8403.81
	82. **Compare methods to conserve energy through technological modification.** 8403.82
Controlling an Electronic System	83. **Analyze a problem whose solution uses electronic controls.** 8403.83

84. **Describe the different methods for using electronically controlled devices.** 8403.84

85. **Use engineering design to solve an identified problem using an electronically controlled device .** 8403.85

86. **Construct a functional model of an electronically controlled device.** 8403.86

87. **Control a device with a microcontroller.** 8403.87

88. **Present information about an electronically controlled device.** 8403.88

Designing a Product

89. **Evaluate the needs and wants of people in school, home, community, or world that could be met through technological change.** 8403.89

90. **Write a statement that defines a problem, challenge, need, or opportunity.** 8403.90

91. **Collect information about a technological problem to be solved.** 8403.91

92. **Generate potential solutions to the problem, challenge, need, or opportunity.** 8403.92

93. **Select the best solution for a problem.** 8403.93

94. **Construct a prototype of the best solution.** 8403.94

95. **Evaluate the solution by comparing it with the problem statement, constraints, and criteria.** 8403.95

96. **Present the final product.** 8403.96