

**Goodheart-Willcox Publisher**  
**Correlation of Foundations of Engineering & Technology**  
**to Maryland Department of Education**  
**(Grades 6–12)**



Grade Band	STEL Benchmark	Correlating Text Pages
<b>STEL 1 Nature and Characteristics of Technology and Engineering</b>		
6-8	<b>1J.</b> Develop innovative products and systems that solve problems and extend capabilities based on individual or collective needs and wants.	5, 9–13, 19, 21, 153–154, 637, 638, 640–647
6-8	<b>1K.</b> Compare and contrast the contributions of science, engineering, mathematics and technology in the development of technological systems.	18–31, 41, 83, 110, 125, 155, 163, 183, 209, 220, 271, 282, 286, 300, 308, 329, 337, 359, 384, 409, 440, 497, 505, 524, 588, 622, 673, 698
6-8	<b>1L.</b> Explain how technology and engineering are closely linked to creativity, which can result in both intended and unintended innovations.	6, 11, 12, 28, 31, 173, 578, 588, 713
6-8	<b>1M.</b> Apply creative problem-solving strategies to the improvement of existing devices or processes or the development of new approaches.	60, 67, 73–75, 90, 93
9-12	<b>1N.</b> Explain how the world around them guides technological development and engineering design.	5, 9–13, 19, 21, 153–154, 637, 638, 640–647
9-12	<b>1O.</b> Assess how similarities and differences among scientific, mathematics, engineering, and technological knowledge and skills contributed to the design of a product or system.	21–24, 22 Figure 2.4 (Connections between Technology, Engineering, and Other Fields of Study )21 (Career Connection)
9-12	<b>1P.</b> Analyze the rate of technological development and predict future diffusion and adoption of new technologies.	6, 170–188, 236–243, 453–454, 553–554, 562
9-12	<b>1Q.</b> Conduct research to inform intentional inventions and innovations that address specific needs and wants.	28, 50–66, 170–188, 687–689
9-12	<b>1R.</b> Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system.	671–679, 682–683, 704

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<b>STEL 2 Core Concepts of Technology and Engineering</b>		
6-8	<b>2M.</b> Differentiate between inputs, processes, outputs, and feedback in technological systems.	152–169, 170–190, 192–211, 212–227
6-8	<b>2N.</b> Illustrate how systems thinking involves considering relationships between every part, as well as how the system interacts with the environment in which it is used.	9, 23, 34, 55, 103, 174, 219, 242, 252, 285, 302, 323, 375, 412, 425, 436, 453, 491, 516, 586, 618, 644, 658, 692
6-8	<b>2O.</b> Create an open-loop system that has no feedback path and requires human intervention.	156–167, 215–225
6-8	<b>2P.</b> Create a closed-loop system that has a feedback path and requires no human intervention.	156–167, 215–225
6-8	<b>2Q.</b> Predict outcomes of a future product or system at the beginning of the design process.	57–64, 89, 120–124
6-8	<b>2R.</b> Compare how different technologies involve different sets of processes.	13–15, 33–34, 197–209, 234–243, 248, 250–251, 297–299, 399–401, 422–424, 453–454, 515–518, 553–554, 613–614
6-8	<b>2S.</b> Defend decisions related to a design problem.	58, 69–71, 194–195
9-12	<b>2T.</b> Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decisionmaking.	95–115, 121–122
9-12	<b>2U.</b> Diagnose a flawed system embedded within a larger technological, social, or environmental system.	54–55, 154–155
9-12	<b>2V.</b> Analyze the stability of a technological system and how it is influenced by all of the components in the system, especially those in the feedback loop.	156–167, 215–225
9-12	<b>2W.</b> Select resources that involve tradeoffs between competing values, such as availability, cost, desirability, and waste while solving problems.	55, 73, 288–289
9-12	<b>2X.</b> Cite examples of the criteria and constraints of a product or system and how they affect final design.	50–66, 70–71, 121–124, 193–197
9-12	<b>2Y.</b> Implement quality control as a planned process to ensure that a product, service, or system meets established criteria.	114–115, 216–218, 290–291, 673, 692–693

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9-12	<b>2Z.</b> Use management processes in planning, organizing, and controlling work.	163–164, 208–209, 211, 672–674, 680, 682–683
<b>STEL 3 Integration of Knowledge, Technologies, and Practices</b>		
6-8	<b>3E.</b> Analyze how different technological systems often interact with economic, environmental, and social systems.	8, 287–288, 638–640, 643–646, 662–663
6-8	<b>3F.</b> Apply a product, system or process developed for one setting to another setting.	642, 646–647, 650
6-8	<b>3G.</b> Explain how knowledge gained from other content areas affects the development of technological products and systems.	21–24
9-12	<b>3H.</b> Analyze how technology transfer occurs when a user applies an existing innovation developed for one function for a different purpose.	25–26, 170–188
9-12	<b>3I.</b> Evaluate how technology enhances opportunities for opportunities products and services through globalization.	289 (Career Connection)
9-12	<b>3J.</b> Connect technological progress to the advancement of other areas of knowledge and vice versa.	18–31, 41, 83, 110, 125, 155, 163, 183, 209, 220, 271, 282, 286, 300, 308, 329, 337, 359, 384, 409, 440, 497, 505, 524, 588, 622, 673, 698
<b>STEL 4 Impacts of Technology</b>		
6-8	<b>4K.</b> Examine the ways that technology can have both positive and negative effects at the same time.	8, 213–215, 288–289, 291–293, 636–647, 662–663, 674–675
6-8	<b>4L.</b> Analyze how the creation and use of technologies consumes renewable and non-renewable resources and creates waste.	185, 373, 64 185
6-8	<b>4M.</b> Devise strategies for reducing, reusing, and recycling waste caused from the creation and use of technology.	170–189, 256–267, 369–375
6-8	<b>4N.</b> Analyze examples of technologies that have changed the way people think, interact, and communicate.	6–7
6-8	<b>4O.</b> Hypothesize what alternative outcomes (individual, cultural, and/or environmental) might have resulted had a different technological solution been selected.	640–647, 662–663
9-12	<b>4P.</b> Evaluate ways that technology can impact individuals, society, and the environment.	640–647, 662–663
9-12	<b>4Q.</b> Critique whether existing or proposed	9–13

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	technologies use resources sustainably.	
9-12	<b>4R.</b> Assess a technology that minimizes resource use and resulting waste to achieve a goal.	644-645
9-12	<b>4S.</b> Develop a solution to a technological problem that has the least negative environmental and social impact.	8, 379–381, 710–711
9-12	<b>4T.</b> Evaluate how technologies alter human health and capabilities.	5, 9–13, 19, 21, 153–154, 637, 638, 640–647
<b>STEL 5 Influence of Society on Technological Development</b>		
6-8	<b>5F.</b> Analyze how an invention or innovation was influenced by its historical context.	8, 20, 41, 83, 110, 125, 155, 163, 183, 209, 220, 271, 282, 286, 300, 308, 329, 337, 359, 384,
6-8	<b>5G.</b> Evaluate trade-offs based on various perspectives as part of a decision process that recognizes the need for careful compromises among competing factors.	73, 288–289
9-12	<b>5H.</b> Evaluate a technological innovation that arose from a specific society's unique need or want.	637-647
9-12	<b>5I.</b> Evaluate a technological innovation that was met with societal resistance impacting its development.	150–167, 171–175
9-12	<b>5J.</b> Design an appropriate technology for use in a different culture.	9–13, 152, 213–214, 653–655, 693
<b>STEL 6 History of Technology</b>		
6-8	<b>6C.</b> Compare various technologies and how they have contributed to human progress.	21-24
6-8	<b>6D.</b> Engage in a research and development process to simulate how inventions and innovations have evolved through systematic tests and refinements.	25, 63, 196-197
6-8	<b>6E.</b> Verify how specialization of function has been at the heart of many technological improvements.	121-122
9-12	<b>6F.</b> Relate how technological development has been evolutionary, often the result of a series of refinements to basic inventions or technological knowledge.	5–6, 9–13, 171, 400, 553–554, 613–614, 688–689
9-12	<b>6G.</b> Verify that the evolution of civilization has been directly affected by, and has in turn affected, the development and use of tools,	5–6, 9–13, 19–20, 99–106, 111–114, 158–159, 175–183



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	materials and processes.	
9-12	<b>6H.</b> Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history.	5–6, 9–13, 158–159, 638–640, 646–647
9-12	<b>6I.</b> Analyze how the Industrial Revolution resulted in the development of mass production, sophisticated transportation and communication systems, advanced construction practices, and improved education and leisure time.	11–12, 34, 250, 393, 436–437, 484, 503, 517–518, 654
9-12	<b>6J.</b> Investigate the widespread changes that have resulted from the Information Age, which has placed emphasis on the processing and exchange of information.	12–13, 27, 654–655
<b>STEL 7 Design in Technology and Engineering Education</b>		
6-8	<b>7P.</b> Illustrate the benefits and opportunities associated with different approaches to design.	122-124, 285-289
6-8	<b>7Q.</b> Apply the technology and engineering design process.	Engineering Design Challenge: 15, 25, 51-64, 67, 92, 118, 148, 162, 168, 190, 193-197, 228, 274, 314, 340, 364, 418, 448, 572, 608, 232, 650, 668, 682, 704
6-8	<b>7R.</b> Refine design solutions to address criteria and constraints.	50–67, 68–92, 94–116, 120–129, 130–147, 194–197
6-8	<b>7S.</b> Create solutions to problems by identifying and applying human factors in design.	Problem-Solving Processes: Engineering Design, 51-52, 56-64, 162, 193-197
6-8	<b>7T.</b> Assess design quality based upon established principles and elements of design.	50-64, 69-90, 95-115
6-8	<b>7U.</b> Evaluate the strengths and weaknesses of different design solutions.	50-64, 69-90, 95-115
6-8	<b>7V.</b> Improve essential skills necessary to successfully design.	57-59
9-12	<b>7W.</b> Determine the best approach by evaluating the purpose of the design.	121-129
9-12	<b>7X.</b> Document trade-offs in the technology and engineering design process to produce the optimal design.	69-90, 95-115, 121-128, 130-145
9-12	<b>7Y.</b> Optimize a design by addressing desired qualities within criteria and constraints.	25, 73, 89, 288-289
9-12	<b>7Z.</b> Apply principles of human-centered design.	51–52, 55, 57, 61, 63, 70–71, 73, 85, 89, 98, 114–115, 286–287, 491–492





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9-12	<b>7AA.</b> Illustrate principles, elements and factors of design.	51–52, 55, 57, 61, 63, 70–71, 73, 85, 89, 98, 114–115, 286–287, 491–492
9-12	<b>7BB.</b> Implement the best possible solution to a design.	57, 59–61, 120–129
9-12	<b>7CC.</b> Apply a broad range of design skills to their design process.	25, 59–61, 195–196
9-12	<b>7DD.</b> Apply a broad range of making skills to their design process.	25, 59–61, 195–196
<b>STEL 8 Applying, Maintaining, and Assessing Technological Products and Systems</b>		
6-8	<b>8H.</b> Research information from various sources to use and maintain technological products or systems.	25, 58–59, 195
6-8	<b>8I.</b> Use tools, materials, and machines to safely diagnose, adjust, and repair systems.	162–165, 175–180, 710
6-8	<b>8J.</b> Use devices to control technological systems.	161–164, 192–211
6-8	<b>8K.</b> Design methods to gather data about technological systems.	58–59, 71–73, 194–195, 544–545, 550–551, 713
6-8	<b>8L.</b> Interpret the accuracy of information collected.	58–59, 71–73, 194–195, 544–545, 550–551
6-8	<b>8M.</b> Use instruments to gather data on the performance of everyday products.	58–59, 71–73, 194–195, 544–545, 550–551
9-12	<b>8N.</b> Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.	93, 130–144, 448
9-12	<b>8O.</b> Develop a device or system for the marketplace.	138, 638–639, 686–690
9-12	<b>8P.</b> Apply appropriate methods to diagnose, adjust and repair systems to ensure precise, safe and proper functionality.	162–165, 175–180, 710
9-12	<b>8Q.</b> Synthesize data and analyze trends to make decisions about technological products, systems or processes.	610–611, 711–713
9-12	<b>8R.</b> Interpret the results of technology assessment to guide policy development.	711–713