New Jersey Standards Alignment with CodeX Curriculum

	Unit 1	Unit 2	Unit 3
Creativity and Innovation			
8.2.5.A.1 Compare and contrast how products made in nature differ from products that are human made in how they are produced and used.			
8.2.5.A.2 Investigate and present factors that influence the development and function of a product and a system.			
8.2.5.A.3 Investigate and present factors that influence the development and function of products and systems, e.g., resources, criteria and constraints.			
8.2.5.A.4 Compare and contrast how technologies have changed over time due to human needs and economic, political and/or cultural influences			
8.2.5.A.5 Identify how improvement in the understanding of materials science impacts technologies.			
Technology and Society			
8.2.5.B.1 Examine ethical considerations in the development and production of a product through its life cycle.			
8.2.5.B.2 Examine systems used for recycling and recommend simplification of the systems and share with product developers.			
8.2.5.B.3 Investigate ways that various technologies are being developed and used to reduce improper use of resources			
8.2.5.B.4 Research technologies that have changed due to society's changing needs and wants.			
8.2.5.B.5 Explain the purpose of intellectual property law			
8.2.5.B.6 Compare and discuss how technologies have influenced history in the past century.			
Design			
8.2.5.C.1 Collaborate with peers to illustrate components of a designed system.			
8.2.5.C.2 Explain how specifications and limitations can be used to direct a product's development.			
8.2.5.C.3 Research how design modifications have lead to new products.			
8.2.5.C.4 Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models.			
8.2.5.C.5 Explain the functions of a system and subsystems.		[1]	
8.2.5.C.6 Examine a malfunctioning tool and identify the process to troubleshoot and present options to repair the tool.			
8.2.5.C.7 Work with peers to redesign an existing product for a different purpose.			
Abilities for a Technological World			
8.2.5.D.1 Identify and collect information about a problem that can be solved by technology, generate ideas to solve the problem, and identify constraints and trade-offs to be considered.			
8.2.5.D.2 Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process to evaluate potential solutions			
8.2.5.D.3 Follow step by step directions to assemble a product or solve a problem.	[2]		
8.2.5.D.4 Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.			
8.2.5.D.5 Describe how resources such as material, energy, information, time, tools, people and capital are used in products or systems.			
8.2.5.D.6 Explain the positive and negative effect of products and systems on humans, other species and the environment, and when the product or system should be used.			
8.2.5.D.7 Explain the impact that resources such as energy and materials used in a process to produce products or system have on the environment.			
Computational Thinking: Programming			
8.2.5.E.1 Identify how computer programming impacts our everyday lives.	[3]		
8.2.5.E.2 Demonstrate an understanding of how a computer takes input of data, processes and stores the data through a series of commands, and outputs information.			
8.2.5.E.3 Using a simple, visual programming language, create a program using loops, events and procedures to generate specific output.		[4]	
8.2.5.E.4 Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing, software, coding, procedure, and data).	[5]		

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Creativity and Innovation			
8.2.8.A.1 Research a product that was designed for a specific demand and identify how the product has changed to meet new demands (i.e. telephone for communication - smart phone for mobility needs).			
8.2.8.A.2 Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system.			
8.2.8.A.3 Investigate a malfunction in any part of a system and identify its impacts.			
8.2.8.A.4 Redesign an existing product that impacts the environment to lessen its impact(s) on the environment.			
8.2.8.A.5 Describe how resources such as material, energy, information, time, tools, people, and capital contribute to a technological product or system.			
Technology and Society			
8.2.8.B.1 Evaluate the history and impact of sustainability on the development of a designed product or system over time and present results to peers.			
8.2.8.B.2 Identify the desired and undesired consequences from the use of a product or system.			
8.2.8.B.3 Research and analyze the ethical issues of a product or system on the environment and report findings for review by peers and /or experts.			
8.2.8.B.4 Research examples of how humans can devise technologies to reduce the negative consequences of other technologies and present your findings.			
8.2.8.B.5 Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries and societies.			
8.2.8.B.6 Compare and contrast the different types of intellectual property including copyrights, patents and trademarks.			
8.2.8.B.7 Analyze the historical impact of waste and demonstrate how a product is upcycled, reused or remanufactured into a new product.			
Design			
8.2.8.C.1 Explain how different teams/groups can contribute to the overall design of a product.			
8.2.8.C.2 Explain the need for optimization in a design process.		[6]	
8.2.8.C.3 Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.			
8.2.8.C.4 Identify the steps in the design process that would be used to solve a designated problem.		[7]	
8.2.8.C.5 Explain the interdependence of a subsystem that operates as part of a system			
8.2.8.C.5.a Create a technical sketch of a product with materials and measurements labeled.			
8.2.8.C.6 Collaborate to examine a malfunctioning system and identify the step-by-step process used to troubleshoot, evaluate and test options to repair the product, presenting the better solution.			
8.2.8.C.7 Collaborate with peers and experts in the field to research and develop a product using the design process, data analysis and trends, and maintain a design log with annotated sketches to record the developmental cycle			
8.2.8.C.8 Develop a proposal for a chosen solution that include models (physical, graphical or mathematical) to communicate the solution to peers.			
Abilities for a Technological World			
8.2.8.D.1 Design and create a product	[8]		
8.2.8.D.2 Identify the design constraints and trade-offs involved in designing a prototype (e.g., how the prototype might fail and how it might be improved) by completing a design problem and reporting results in a multimedia presentation, design portfolio or engineering notebook.			
8.2.8.D.3 Build a prototype that meets a STEM-based design challenge using science, engineering, and math principles that validate a solution.	[9]		
8.2.8.D.4 Research and publish the steps for using and maintaining a product or system and incorporate diagrams or images throughout to enhance user comprehension.			
8.2.8.D.5 Explain the impact of resource selection and the production process in the development of a common or technological product or system.			
8.2.8.D.6 Identify and explain how the resources and processes used in the production of a current technological product can be modified to have a more positive impact on the environment.			
Computational Thinking: Programming			
8.2.8.E.1 Identify ways computers are used that have had an impact across the range of human activity and within different careers where they are used.			
8.2.8.E.2 Demonstrate an understanding of the relationship between hardware and software.	[10]		
8.2.8.E.3 Develop an algorithm to solve an assigned problem using a specified set of commands and use peer review to critique the solution.			
8.2.8.E.4 Use appropriate terms in conversation (e.g., programming, language, data, RAM, ROM, Boolean logic terms).			

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	Unit 1	Unit 2	Unit 3
Creativity and Innovation			
8.2.12.A.1 Propose an innovation to meet future demands supported by an analysis of the potential full costs, benefits, trade-offs and risks, related to the use of the innovation			
8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.			
8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.			
Technology and Society			
8.2.12.B.1 Research and analyze the impact of the design constraints (specifications and limits) for a product or technology driven by a cultural, social, economic or political need and publish for review.			
8.2.12.B.2 Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.			
8.2.12.B.3 Analyze ethical and unethical practices around intellectual property rights as influenced by human wants and/or needs.			
8.2.12.B.4 Investigate a technology used in a given period of history, e.g., stone age, industrial revolution or information age, and identify their impact and how they may have changed to meet human needs and wants.			
8.2.12.B.5 Research the historical tensions between environmental and economic considerations as driven by human needs and wants in the development of a technological product, and present the competing viewpoints to peers for review.			
Design			
8.2.12.C.1 Explain how open source technologies follow the design process.			
8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.			
8.2.12.C.3 Analyze a product or system for factors such as safety, reliability, economic considerations, quality control, environmental concerns, manufacturability, maintenance and repair, and human factors engineering (ergonomics).			
8.2.12.C.4 Explain and identify interdependent systems and their functions.			
8.2.12.C.5 Create scaled engineering drawings of products both manually and digitally with materials and measurements labeled.			
8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.			
8.2.12.C.7 Use a design process to devise a technological product or system that addresses a global problem, provide research, identify trade-offs and constraints, and document the process through drawings that include data and materials.			
Abilities for a Technological World			
8.2.12.D.1 Design and create a prototype to solve a real world problem using a design process, identify constraints addressed during the creation of the prototype, identify trade-offs made, and present the solution for peer review			
8.2.12.D.2 Write a feasibility study of a product to include: economic, market, technical, financial, and management factors, and provide recommendations for implementation.			
8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.			
8.2.12.D.4 Assess the impacts of emerging technologies on developing countries			
8.2.12.D.5 Explain how material processing impacts the quality of engineered and fabricated products.			
8.2.12.D.6 Synthesize data, analyze trends and draw conclusions regarding the effect of a technology on the individual, society, or the environment and publish conclusions.			
Computational Thinking: Programming			
8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.			
8.2.12.E.2 Analyze the relationships between internal and external computer components.	[11]		
8.2.12.E.3 Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games).	[12]		
8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).			

[1] These can be done with flowcharts of the more advanced missions like Mission 7

[2] All of our missions have you do this

[3] This is discussed at the end of each Mission

[4] Remixes are where students can create their own codes

[5] These are taught in the missions and referenced with the toolbox

[6] This would be like the use of created functions which are introduced in Mission 9

[7] This would be the pseudocodes which are introduced in the teachers' manual

[8] All remixes which begin in Mission 4 are designed and created products by the students

[9] This could be the remixes depending on the rubric the teacher provides

[10] This is discussed any time a new part of the hardware is introduced like the buttons and sensors

[11] This is discussed any time a new part of the hardware is introduced like the buttons and sensors

[12] All of our missions are robotic functions