Skill Struck ®

Skill Struck's alignment to

2020 New Jersey Student Learning Standards – Computer Science and Design Thinking

Legend

✅ = Standard aligned

🔷 = Not currently aligned

Standard	Status
8.1.2.CS.1 Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.	✅
8.1.2.CS.2 Explain the functions of common software and hardware components of computing systems.	✅
8.1.2.CS.3 Describe basic hardware and software problems using accurate terminology.	✅
8.1.2.NI.1 Model and describe how individuals use computers to connect to other individuals, places, information, and ideas through a network.	✅

8.1.2.NI.2 Describe how the Internet enables individuals to connect with others worldwide.	✅
8.1.2.NI.3 Create a password that secures access to a device. Explain why it is important to create unique passwords that are not shared with others.	✅
8.1.2.NI.4 Explain why access to devices need to be secured.	✅
8.1.2.IC.1 Compare how individuals live and work before and after the implementation of new computing technology.	✅
8.1.2.DA.1 Collect and present data, including climate change data, in various visual formats.	✅
8.1.2.DA.2 Store, copy, search, retrieve, modify, and delete data using a computing device.	✅
8.1.2.DA.3 Identify and describe patterns in data visualizations.	✅
8.1.2.DA.4 Make predictions based on data using charts or graphs.	✅
8.1.2.AP.1 Model daily processes by creating and following algorithms to complete tasks.	✅
8.1.2.AP.2 Model the way programs store and manipulate data by using numbers or other symbols to represent information	✅

8.1.2.AP.3 Create programs with sequences and simple loops to accomplish tasks.	✅
8.1.2.AP.4 Break down a task into a sequence of steps.	✅
8.1.2.AP.5 Describe a program's sequence of events, goals, and expected outcomes.	✅
8.1.2.AP.6 Debug errors in an algorithm or program that includes sequences and simple loops.	✅
8.1.5.CS.1 Model how computing devices connect to other components to form a system.	✅
8.1.5.CS.2 Model how computer software and hardware work together as a system to accomplish tasks.	✅
8.1.5.CS.3 Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.	✅
8.1.5.NI.1 Develop models that successfully transmit and receive information using both wired and wireless methods.	✅
8.1.5.NI.2 Describe physical and digital security measures for protecting sensitive personal information.	✅
8.1.5.IC.1 Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.	✅

8.1.5.IC.2 Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.	✅
8.1.5.DA.1 Collect, organize, and display data in order to highlight relationships or support a claim.	✅
8.1.5.DA.2 Compare the amount of storage space required for different types of data.	✅
8.1.5.DA.3 Organize and present collected data visually to communicate insights gained from different views of the data.	✅
8.1.5.DA.4 Organize and present climate change data visually to highlight relationships or support a claim.	✅
8.1.5.DA.5 Propose cause and effect relationships, predict outcomes, or communicate ideas using data.	✅
8.1.5.AP.1 Compare and refine multiple algorithms for the same task and determine which is the most appropriate.	✅
8.1.5.AP.2 Create programs that use clearly named variables to store and modify data.	✅
8.1.5.AP.3 Create programs that include sequences, events, loops, and conditionals.	✅
8.1.5.AP.4 Break down problems into smaller, manageable sub-problems to facilitate	✅

program development.	
8.1.5.AP.5 Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program.	✅
8.1.5.AP.6 Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.	✅
8.1.8.CS.1 Recommend improvements to computing devices in order to improve the ways users interact with the devices.	✅
8.1.8.CS.2 Design a system that combines hardware and software components to process data.	✅
8.1.8.CS.3 Justify design decisions and explain potential system trade-offs.	✅
8.1.8.CS.4 Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.	✅
8.1.8.NI.1 Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination.	✅
8.1.8.NI.2 Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication.	✅
8.1.8.NI.3 Explain how network security depends on a combination of hardware,	✅

software, and practices that control access to data and systems.	
8.1.8.NI.4 Explain how new security measures have been created in response to key malware events.	✅
8.1.8.IC.1 Compare the trade-offs associated with computing technologies that affect individual's everyday activities and career options.	✅
8.1.8.IC.2 Describe issues of bias and accessibility in the design of existing technologies.	✅
8.1.8.DA.1 Organize and transform data collected using computational tools to make it usable for a specific purpose.	✅
8.1.8.DA.2 Explain the difference between how the computer stores data as bits and how the data is displayed.	✅
8.1.8.DA.3 Identify the appropriate tool to access data based on its file format.	✅
8.1.8.DA.4 Transform data to remove errors and improve the accuracy of the data for analysis.	✅
8.1.8.DA.5 Test, analyze, and refine computational models.	✅
2.AP.PD.4 Using correct terminology, describe steps taken and choices made during the iterative process of program (procedure) development.	✅
8.1.8.DA.6	✅

Analyze climate change computational models and propose refinements.	
8.1.8.AP.1 Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.	✅
8.1.8.AP.2 Create clearly named variables that represent different data types and perform operations on their values.	✅
8.1.8.AP.3 Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.	✅
8.1.8.AP.4 Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs.	✅
8.1.8.AP.5 Create procedures with parameters to organize code and make it easier to reuse	✅
8.1.8.AP.6 Refine a solution that meets users' needs by incorporating feedback from team members and users	✅
8.1.8.AP.7 Design programs, incorporating existing code, media, and libraries, and give attribution	✅
8.1.8.AP.8 Systematically test and refine programs using a range of test cases and users.	✅
8.1.8.AP.9 Document programs in order to make them easier to follow, test, and	✅

debug.	
8.1.12.CS.1 Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.	✅
8.1.12.CS.2 Model interactions between application software, system software, and hardware.	✅
8.1.12.CS.3 Compare the functions of application software, system software, and hardware.	✅
8.1.12.CS.4 Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.	✅
8.1.12.NI.1 Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.	✅
8.1.12.NI.2 Evaluate security measures to address various common security threats.	✅
8.1.12.NI.3 Explain how the needs of users and the sensitivity of data determine the level of security implemented.	🔷
8.1.12.NI.4 Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.	🔷
8.1.12.IC.1 Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.	✅

8.1.12.IC.2 Test and refine computational artifacts to reduce bias and equity deficits.	✅
8.1.12.IC.3 Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.	✅
8.1.12.DA.1 Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.	✅
8.1.12.DA.2 Describe the trade-offs in how and where data is organized and stored.	✅
8.1.12.DA.3 Translate between decimal numbers and binary numbers.	✅
8.1.12.DA.4 Explain the relationship between binary numbers and the storage and use of data in a computing device	✅
8.1.12.DA.5 Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.	✅
8.1.12.DA.6 Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.	✅
8.1.12.AP.1 Design algorithms to solve computational problems using a combination of original and existing algorithms.	✅

8.1.12.AP.2 Create generalized computational solutions using collections instead of repeatedly using simple variables.	✅
8.1.12.AP.3 Select and combine control structures for a specific application based upon performance and readability, and identify trade-offs to justify the choice.	✅
8.1.12.AP.4 Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue.	✅
8.1.12.AP.5 Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.	✅
8.1.12.AP.6 Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.	✅
8.1.12.AP.7 Collaboratively design and develop programs and artifacts for broad audiences by incorporating feedback from users.	✅
8.1.12.AP.8 Evaluate and refine computational artifacts to make them more usable and accessible.	✅
8.1.12.AP.9 Collaboratively document and present design decisions in the development of complex programs.	✅
8.2.2.ED.1 Communicate the function of a product or device.	✅

8.2.2.ED.2 Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.	✅
8.2.2.ED.3 Select and use appropriate tools and materials to build a product using the design process.	✅
8.2.2.ED.4 Identify constraints and their role in the engineering design process.	✅
8.2.2.ITH.1 Identify products that are designed to meet human wants or needs.	✅
8.2.2.ITH.2 Explain the purpose of a product and its value.	✅
8.2.2.ITH.3 Identify how technology impacts or improves life.	✅
8.2.2.ITH.4 Identify how various tools reduce work and improve daily tasks.	✅
8.2.2.ITH.5 Design a solution to a problem affecting the community in a collaborative team and explain the intended impact of the solution.	✅
8.2.2.NT.1 Model and explain how a product works after taking it apart, identifying the relationship of each part, and putting it back together.	✅
8.2.2.NT.2 Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.	✅
8.2.2.ETW.1 Classify products as resulting from nature or produced as a result of	🔷

technology.	
8.2.2.ETW.2 Identify the natural resources needed to create a product.	🔷
8.2.2.ETW.3 Describe or model the system used for recycling technology.	🔷
8.2.2.ETW.4 Explain how the disposal of or reusing a product affects the local and global environment.	🔷
8.2.2.EC.1 Identify and compare technology used in different schools, communities, regions, and parts of the world.	✅
8.2.5.ED.1 Explain the functions of a system and its subsystems.	✅
8.2.5.ED.2 Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.	✅
8.2.5.ED.3 Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.	✅
8.2.5.ED.4 Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).	✅
8.2.5.ED.5 Describe how specifications and limitations impact the engineering design process.	✅
8.2.5.ED.6	✅

Evaluate and test alternative solutions to a problem using the constraints and tradeoffs identified in the design process.	
8.2.5.ITH.1 Explain how societal needs and wants influence the development and function of a product and a system.	✅
8.2.5.ITH.2 Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have.	✅
8.2.5.ITH.3 Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use.	✅
8.2.5.ITH. Describe a technology/tool that has made the way people live easier or has led to a new business or career.	✅
8.2.5.NT.1 Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem.	✅
8.2.5.NT.2 Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies.	✅
8.2.5.NT.3 Redesign an existing product for a different purpose in a collaborative team.	✅
8.2.5.NT.4 Identify how improvement in the understanding of materials science impacts technologies.	✅
8.2.5.ETW.1	✅

Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems.	
8.2.5.ETW.2 Describe ways that various technologies are used to reduce improper use of resources.	✅
8.2.5.ETW.3 Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.	✅
8.2.5.ETW.4 Explain the impact that resources, such as energy and materials used to develop technology, have on the environment.	✅
8.2.5.ETW.5 Identify the impact of a specific technology on the environment and determine what can be done to increase positive effects and to reduce any negative effects, such as climate change.	✅
8.2.5.EC.1 Analyze how technology has contributed to or reduced inequities in local and global communities and determine its short- and long-term effects.	✅
8.2.8.ED.1 Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.	✅
8.2.8.ED.2 Identify the steps in the design process that could be used to solve a problem.	✅
8.2.8.ED.3 Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).	✅

8.2.8.ED.4 Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team.	✅
8.2.8.ED.5 Explain the need for optimization in a design process.	✅
8.2.8.ED.6 Analyze how trade-offs can impact the design of a product.	✅
8.2.8.ED.7 Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches).	✅
8.2.8.ITH.1 Explain how the development and use of technology influences economic, political, social, and cultural issues.	✅
8.2.8.ITH.2 Compare how technologies have influenced society over time.	✅
8.2.8.ITH.3 Evaluate the impact of sustainability on the development of a designed product or system.	🔷
8.2.8.ITH.4 Identify technologies that have been designed to reduce the negative consequences of other technologies and explain the change in impact.	🔷
8.2.8.ITH.5 Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another.	✅

8.2.8.NT.1 Examine a malfunctioning tool, product, or system and propose solutions to the problem.	✅
8.2.8.NT.2 Analyze an existing technological product that has been repurposed for a different function.	🔹
8.2.8.NT.3 Examine a system, consider how each part relates to other parts, and redesign it for another purpose.	🔹
8.2.8.NT.4 Explain how a product designed for a specific demand was modified to meet a new demand and led to a new product.	🔹
8.2.8.ETW.1 Illustrate how a product is upcycled into a new product and analyze the short- and long-term benefits and costs.	✅
8.2.8.ETW.2 Analyze the impact of modifying resources in a product or system (e.g., materials, energy, information, time, tools, people, capital).	✅
8.2.8.ETW.3 Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact.	✅
8.2.8.ETW.4 Compare the environmental effects of two alternative technologies devised to address climate change issues and use data to justify which choice is best.	✅
8.2.8.EC.1 Explain ethical issues that may arise from the use of new technologies.	✅

8.2.8.EC.2 Examine the effects of ethical and unethical practices in product design and development.	✅
8.2.12.ED.1 Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers.	✅
8.2.12.ED.2 Create scaled engineering drawings for a new product or system and make modification to increase optimization based on feedback.	🔷
8.2.12.ED.3 Evaluate several models of the same type of product and make recommendations for a new design based on a cost benefit analysis.	🔷
8.2.12.ED.4 Design a product or system that addresses a global problem and document decisions made based on research, constraints, trade-offs, and aesthetic and ethical considerations and share this information with an appropriate audience.	✅
8.2.12.ED.5 Evaluate the effectiveness of a product or system based on factors that are related to its requirements, specifications, and constraints (e.g., safety, reliability, economic considerations, quality control, environmental concerns, manufacturability, maintenance and repair, ergonomics).	🔷
8.2.12.ED.6 Analyze the effects of changing resources when designing a specific product or system (e.g., materials, energy, tools, capital, labor).	🔷
8.2.12.ITH.1 Analyze a product to determine the impact that economic, political, social, and/or cultural factors have had on its design, including its design	✅

constraints.	
8.2.12.ITH.2 Propose an innovation to meet future demands supported by an analysis of the potential costs, benefits, trade-offs, and risks related to the use of the innovation.	✅
8.2.12.ITH.3 Analyze the impact that globalization, social media, and access to open source technologies has had on innovation and on a society's economy, politics, and culture.	✅
8.2.12.NT.1 Explain how different groups can contribute to the overall design of a product.	✅
8.2.12.NT.2 Redesign an existing product to improve form or function.	✅
8.2.12.ETW.1 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.ETW.2 Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment.	🔷
8.2.12.ETW.3 Identify a complex, global environmental or climate change issue, develop a systemic plan of investigation, and propose an innovative sustainable solution.	🔷
8.2.12.EC.1 Analyze controversial technological issues and determine the degree to which individuals, businesses, and governments have an ethical role in	✅

decisions that are made.	
8.2.12.EC.2 Assess the positive and negative impacts of emerging technologies on developing countries and evaluate how individuals, non-profit organizations, and governments have responded.	🔷
8.2.12.EC.3 Synthesize data, analyze trends, and draw conclusions regarding the effect of a technology on the individual, culture, society, and environment and share this information with the appropriate audience.	🔷
8.2.12.ETW.4 Research 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.	🔷