PROPOSED

NEVADA ACADEMIC CONTENT STANDARDS

for

COMPUTER SCIENCE AND INTEGRATED TECHNOLOGY

The 2019 Nevada Academic Content Standards for Computer Science and Integrated Technology were written by contributors from all across the state of Nevada, under the direction of the Nevada Department of Education Office of Standards and Instructional Support.

This set of standards is comprised of the K-12 Computer Science Standards and the K-12 Integrated Technology Standards to be referred to collectively from this point on as The *Nevada Academic Content Standards for Computer Science and Integrated Technology*.

March 1, 2019

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	Connections to other NVACS at this grade level
NVACS for Science	(6-8.AP.A.1) – SEP 3, SEP 5, MS-PS3-4 (6-8.AP.V.1) – SEP 4, MS-PS3-1, MS-LS2-1, MS-LS4-1 (6-8.AP.C.1) – DCI ETS1, MS-LS2-5 (6-8.AP.M.1) – CCC 4, MS-LS2-2, MS-LS3-1 (6-8.AP.M.2) – CCC 4 (6-8.AP.PD.1) – MS-LS2-5
NVACS for Mathematics	(6-8.AP.A.1) – SMP2 (6-8.AP.V.1) – SMP6, 6.EE.A.2, 7.EE.B.4 (6-8.AP.C.1) – SMP1 (6-8.AP.M.1) – SMP7 (6-8.AP.M.2) – SMP1 (6-8.AP.PD.1) – SMP1 (6-8.AP.PD.2) – SMP7 (6-8.AP.PD.3) – 7.SP.C5, 7.SP.C7 (6-8.AP.PD.5) – SMP3
NVACS for ELA	(6-8.AP.A.1) – RI.6-12.5 (6-8.AP.V.1) – L.6-12.3 (6-8.AP.C.1) – SL.6-12.3 (6-8.AP.M.2) – W.6-12.1, W.6-12.2 (6-8.AP.PD.1) – SL.6-12.1 (6-8.AP.PD.5) – SL.6-12.4
NVACS for Social Studies	(6-8.AP.PD.1-5) – SS.WGGS.17

Computing Systems

By the end of Grade 8, students who demonstrate understanding can:

Indicator	Standard
6-8.CS.D.1	Recommend improvements to the design of computing devices based on an analysis of how users interact with the devices, noting that advantages may have disadvantages and unintended consequences.
6-8.CS.HS.1	Design and evaluate projects that combine hardware and software components to collect and exchange data.
6-8.CS.T.1	Systematically identify and fix problems with computing devices and their components.

Practice Connection	Concept Connection
Practice 3. Recognizing and Defining Computational Problems *3. Evaluate whether it is appropriate and feasible to solve a problem computationally* (6-8.CS.D.1). **Practice 5. Creating Computational Artifacts** *1. Plan the development of a computational artifact using an iterative process that includes reflection on and modification of the plan, taking into account key features, time and resource constraints, and user expectations* (6-8.CS.HS.1). **Practice 6. Testing and Refining Computational Artifacts** *2. Identify and fix errors using a systematic process* (6-8.CS.T.1).	**Computing Systems** • CS.D: Devices - *The interaction between humans and computing devices presents advantages, disadvantages, and unintended consequences. The study of human-computer interaction can improve the design of devices and extend the abilities of humans* (6-8.CS.D.1). • CS.HS: Hardware and Software - *Hardware and software determine a computing system's capability to store and process information. The design or selection of a computing system involves multiple considerations and potential tradeoffs, such as functionality, cost, size, speed, accessibility, and aesthetics* (6-8.CS.HS.1). • CS.T: Troubleshooting - *Comprehensive troubleshooting requires knowledge of how computing devices and components work and interact. A systematic process will identify the source of a problem whether within a device or in a larger system of connected devices* (6-8.CS.T.1).

	Connections to other NVACS at this grade level
NVACS for Science	None
NVACS for Mathematics	(6-8.CS.D.1) – SMP3 (6-8.CS.HS.1) – SMP2, SMP3 (6-8.CS.T.1) – SMP8
NVACS for ELA	(6-8.CS.T.1) – W.6-12.5
NVACS for Social Studies	None

Data and Analysis

By the end of Grade 8, students who demonstrate understanding can:

Indicator	Standard
6-8.DA.S.1	Model encoding schema used by software tools to access data, stored as bits, into forms more easily understood by people (e.g., encoding schema include binary and ASCII).
6-8.DA.CVT.1	Collect data using computational tools and transform the data to make it more meaningful and useful.
6-8.DA.IM.1	Refine computational models based on the reliability and validity of the data they generate.

Practice Connection	Concept Connection
Practice 4. Developing and Using Abstractions *1. Extract common features from a set of interrelated processes or complex phenomena* (6-8.DA.S.1). *4. Model phenomena and processes and simulate systems to understand and evaluate potential outcomes* (6-8.DA.S.1 and 6-8.DA.IM.1). **Practice 5. Creating Computational Artifacts** *3. Modify an existing artifact to improve or customize it* (6-8.DA.IM.1). **Practice 6. Testing and Refining Computational Artifacts** *3. Evaluate and refine a computational artifact multiple times to enhance its performance, reliability, usability, and accessibility* (6-8.DA.CVT.1).	**Data and Analysis** ● DA.S: Storage - *Applications store data as a representation. Representations occur at multiple levels, from the arrangement of information into organized formats (such as tables in software) to the physical storage of bits. The software tools used to access information translate the low-level representation of bits into a form understandable by people* (6-8.DA.S.1). ● DA.CVT: Collection, Visualization, and Transformation - *People design algorithms and tools to automate the collection of data by computers. When data collection is automated, data is sampled and converted into a form that a computer can process. For example, data from an analog sensor must be converted into a digital form. The method used to automate data collection is influenced by the availability of tools and the intended use of the data. Data can be transformed to remove errors, highlight or expose relationships, and/or make it easier for computers to process* (6-8.DA.CVT.1). ● DA.IM: Inference and Models - *Computer models can be used to simulate events, examine theories and inferences, or make predictions with either few or millions of data points. Computer models are abstractions that represent phenomena and use data and algorithms to emphasize key features and relationships within a system. As more data is automatically collected, models can be refined* (6-8.DA.IM.1).

	Connections to other NVACS at this grade level
NVACS for Science	(6-8.DA.CVT.1) – MS-LS4-6 (6-8.DA.IM.1) – MS-LS4-3, MS-LS3-1 & 3-2
NVACS for Mathematics	(6-8.DA.S.1) – SMP4 (6-8.DA.CVT.1) – SMP5, 7.SP.C (6-8.DA.IM.1) – SMP1, 7.SP.C
NVACS for ELA	(6-8.DA.CVT.1) – W.6-12.9 (6-8.DA.IM.1) – W.6-12.8
NVACS for Social Studies	None

Impacts of Computing

By the end of Grade 8, students who demonstrate understanding can:

Indicator	Standard
6-8.IC.C.1	Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.
6-8.IC.C.2	Discuss and evaluate issues of bias and accessibility in the design of existing technologies.
6-8.IC.SI.1	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact.
6-8.IC.SLE.1	Identify risks associated with sharing information digitally (e.g., phishing, identity theft, hacking).
6-8.IC.SLE.2	Evaluate how legal and ethical issues shape computing practices.

Practice Connection	Concept Connection
Practice 1. Fostering an Inclusive Computing Culture *2. Address the needs of diverse end users during the design process to produce artifacts with broad accessibility and usability* (6-8.IC.C.2). **Practice 2. Collaborating Around Computing** *4. Evaluate and select technological tools that can be used to collaborate on a project* (6-8.IC.SI.1). **Practice 5. Creating Computational Artifacts** *2. Create a computational artifact for practical intent, personal expression, or to address a societal issue* (6-8.IC.SI.1). **Practice 7. Communicating About Computing** *2. Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose* (6-8.IC.C.1 and 6-8.IC.SLE.1). *3. Articulate ideas responsibly by observing intellectual property rights and giving appropriate attribution* (6-8.IC.SLE.2).	**Impacts of Computing** ● IC.C: Culture - *Advancements in computing technology change people's everyday activities. Society is faced with tradeoffs due to the increasing globalization and automation that computing brings* (6-8.IC.C.1 and 6-8.IC.C.2). ● IC.SI: Social Interactions - *People can organize and engage around issues and topics of interest through various communication platforms enabled by computing, such as social networks and media outlets. These interactions allow issues to be examined using multiple viewpoints from a diverse audience* (6-8.IC.SI.1). ● IC.SLE: Safety, Law, and Ethics - *There are tradeoffs between allowing information to be public and keeping information private and secure. People can be tricked into revealing personal information when more public information is available about them online* (6-8.IC.SLE.1 and 6-8.IC.SLE.2).

	Connections to other NVACS at this grade level
NVACS for Science	None
NVACS for Mathematics	None
NVACS for ELA	(6-8.IC.SI.1) – SL.6-12.1
NVACS for Social Studies	None

Networks and the Internet

By the end of Grade 8, students who demonstrate understanding can:

Indicator	Standard
6-8.NI.NCO.1	Compare and contrast modeled protocols used in transmitting data across networks and the Internet.
6-8.NI.C.1	Explain how physical and digital security measures protect electronic information.
6-8.NI.C.2	Apply multiple methods of encryption to model the secure transmission of information.

Practice Connection	Concept Connection
Practice 4. Developing and Using Abstractions *4. Model phenomena and processes and simulate systems to understand and evaluate potential outcomes* (6-8.NI.NCO.1 and 6-8.NI.C.2). **Practice 7. Communicating About Computing** *2. Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose* (6-8.NI.C.1).	**Networks and the Internet** ● NI.NCO: Network, Communication, and Organization - *Computers send and receive information based on a set of rules called protocols. Protocols define how messages between computers are structured and sent. Considerations of security, speed, and reliability are used to determine the best path to send and receive data* (6-8.NI.NCO.1). ● NI.C: Cybersecurity - *The information sent and received across networks can be protected from unauthorized access and modification in a variety of ways, such as encryption to maintain its confidentiality and restricted access to maintain its integrity. Security measures to safeguard online information proactively address the threat of breaches to personal and private data* (6-8.NI.C.1 and 6-8.NI.C.2).

	Connections to other NVACS at this grade level
NVACS for Science	(6-8.NI.NCO.1) – MS-PS4-3, MS-ETS1-2, SEP2 (6-8.NI.C.1) – SEP6
NVACS for Mathematics	None
NVACS for ELA	None
NVACS for Social Studies	(6-8.NI.C.1-2) – Connect to financial literacy (risk)

Algorithms and Programming

By the end of Grade 12, students who demonstrate understanding can:

Indicator	Standard
9-12.AP.A.1	Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.
9-12.AP.V.1	Demonstrate the use of both linked lists and arrays to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.
9-12.AP.C.1	Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.
9-12.AP.C.2	Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
9-12.AP.M.1	Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
9-12.AP.M.2	Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.
9-12.AP.PD.1	Systematically design and develop programs for broad audiences by incorporating feedback from users.
9-12.AP.PD.2	Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.
9-12.AP.PD.3	Evaluate and refine computational artifacts to make them more usable by all and accessible to people with disabilities.
9-12.AP.PD.4	Design and develop computational artifacts working in team roles using collaborative tools.
9-12.AP.PD.5	Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.

Practice Connection	Concept Connection
Practice 2. Collaborating Around Computing *4. Evaluate and select technological tools that can be used to collaborate on a project* (9-12.AP.PD.4). **Practice 3. Recognizing and Defining Computational Problems** *2. Decompose complex real-world problems into manageable subproblems that could integrate existing solutions or procedures* (9-12.AP.C.1 and 9-12.AP.M.1). **Practice 4. Developing and Using Abstractions** *1. Extract common features from a set of interrelated processes or complex phenomena* (9-12.AP.V.1). **Practice 5. Creating Computational Artifacts** *1. Plan the development of a computational artifact using an iterative process that includes reflection on and modification of the plan, taking into account key features, time and resource constraints, and user expectations* (9-12.AP.PD.1). *2. Create a computational artifact for practical intent, personal expression, or to address a societal issue* (9-12.AP.A.1, 9-12.AP.C.1-2, and 9-12.AP.M.2). **Practice 6. Testing and Refining Computational Artifacts** *3. Evaluate and refine a computational artifact multiple times to enhance its performance, reliability, usability, and accessibility* (9-12.AP.PD.3). **Practice 7. Communicating About Computing** *2. Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose* (9-12.AP.PD.5). *3. Articulate ideas responsibly by observing intellectual property rights and giving appropriate attribution* (9-12.AP.PD.2).	**Algorithms and Programming** ● AP.A: Algorithms - *People evaluate and select algorithms based on performance, reusability, and ease of implementation. Knowledge of common algorithms improves how people develop software, secure data, and store information* (9-12.AP.A.1). ● AP.V: Variables - *Data structures are used to manage program complexity. Programmers choose data structures based on functionality, storage, and performance tradeoffs* (9-12.AP.V.1). ● AP.C: Control - *Programmers consider tradeoffs related to implementation, readability, and program performance when selecting and combining control structures* (9-12.AP.C.1 and 9-12.AP.C.2). ● AP.M: Modularity - *Complex programs are designed as systems of interacting modules, each with a specific role, coordinating for a common overall purpose. These modules can be procedures within a program; combinations of data and procedures; or independent, but interrelated, programs. Modules allow for better management of complex tasks* (9-12.AP.M.1 and 9-12.AP.M.2). ● AP.PD: Program Development - *Diverse teams can develop programs with a broad impact through careful review and by drawing on the strengths of members in different roles. Design decisions often involve tradeoffs. The development of complex programs is aided by resources such as libraries and tools to edit and manage parts of the program. Systematic analysis is critical for identifying the effects of lingering bugs* (9-12.AP.PD.1-5).

	Connections to other NVACS at this grade level
NVACS for Science	(9-12.AP.A.1) – HS-ETS1-2 (9-12.AP.C.1) – HS-ETS1-3, SEP7 (9-12.AP.M.1) – HS-ETS1-2 (9-12.AP.M.2) – HS-ETS1-4 (9-12.AP.PD.1) – CCC4, HS-ETS1-3 (9-12.AP.PD.3) – SEP8 (9-12.AP.PD.4) – SEP5, SEP8 (9-12.AP.PD.5) – SEP8

NVACS for Mathematics	(9-12.AP.A.1) – SMP 1, 2, 4, 7, & 8 (9-12.AP.V.1) – SMP 4, 5, & 7 (9-12.AP.C.1) – SMP 2 & 3 (9-12.AP.C.2) – SMP 4 (9-12.AP.M.1) – SMP 2, 6, & 7 (9-12.AP.PD.1) – SMP 1-4 (9-12.AP.PD.3) – SMP 3 & 6 (9-12.AP.PD.4) – SMP 4 & 5 (9-12.AP.PD.5) – SMP 1, 2, 4, & 5
NVACS for ELA	(9-12.AP.A.1) – ELA W.9-10.3 (9-12.AP.V.1) – ELA L.9-10.1b (9-12.AP.C.1) – ELA W.9-10.1 (9-12.AP.M.1) – ELA RI.9-10.3 (9-12.AP.PD.1) – ELA W.9-10.5 (9-12.AP.PD.2) – ELA RI.9-10.7 (9-12.AP.PD.3) – ELA RI.9-10.8 (9-12.AP.PD.4) – ELA W.9-10.3a (9-12.AP.PD.5) – ELA W.9-10.2a
NVACS for Social Studies	None

Computing Systems

By the end of Grade 12, students who demonstrate understanding can:

Indicator	Standard
9-12.CS.D.1	Explain how abstractions hide the underlying implementation details of computing systems embedded in everyday objects.
9-12.CS.HS.1	Compare levels of abstraction and interactions between application software, system software, and hardware layers.
9-12.CS.T.1	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

Practice Connection	Concept Connection
Practice 4. Developing and Using Abstractions *1. Extract common features from a set of interrelated processes or complex phenomena* (9-12.CS.D.1 and 9-12.CS.HS.1). **Practice 6. Testing and Refining Computational Artifacts** *2. Identify and fix errors using a systematic process* (9-12.CS.T.1).	**Computing Systems** ● CS.D: Devices - *Computing devices are often integrated with other systems, including biological, mechanical, and social systems. These devices can share data with one another. The usability, dependability, security, and accessibility of these devices, and the systems they are integrated with, are important considerations in their design as they evolve* (9-12.CS.D.1). ● CS.HS: Hardware and Software - *Levels of interaction exist between the hardware, software, and user of a computing system. The most common levels of software that a user interacts with include system software and applications. System software controls the flow of information between hardware components used for input, output, storage, and processing* (9-12.CS.HS.1). ● CS.T: Troubleshooting - *Troubleshooting complex problems involves the use of multiple sources when researching, evaluating, and implementing potential solutions. Troubleshooting also relies on experience, such as when people recognize that a problem is similar to one they have seen before or adapt solutions that have worked in the past* (9-12.CS.T.1).

	Connections to other NVACS at this grade level
NVACS for Science	(9-12.CS.D.1) – SEP2, SEP8 (9-12.CS.HS.1) – SEP2, SEP8 (9-12.CS.T.1) – SEP2, SEP8
NVACS for Mathematics	(9-12.CS.CS.T.1) – SMP3
NVACS for ELA	(9-12.CS.D.1) – ELA RI.9-10.3 (9-12.CS.HS.1) – ELA RI.6.9 (9-12.CS.T.1) – ELA W.9-10.2b
NVACS for Social Studies	None

Data and Analysis

By the end of Grade 12, students who demonstrate understanding can:

Indicator	Standard
9-12.DA.S.1	Translate between different bit representations of real-world phenomena, such as characters, numbers, and images (e.g., convert hexadecimal colors to decimal percentages, ASCII/Unicode representation).
9-12.DA.S.2	Evaluate the tradeoffs in how data elements are organized and where data is stored.
9-12.DA.CVT.1	Create interactive data visualizations or alternative representations using software tools to help others better understand real-world phenomena.
9-12.DA.IM.1	Create computational models that represent the relationships among different elements of data collected from a phenomenon, process, or model.

Practice Connection	Concept Connection
Practice 3. Recognizing and Defining Computational Problems *3. Evaluate whether it is appropriate and feasible to solve a problem computationally* (9-12.DA.S.2). **Practice 4. Developing and Using Abstractions** *1. Extract common features from a set of interrelated processes or complex phenomena* (9-12.DA.S.1). *4. Model phenomena and processes and simulate systems to understand and evaluate potential outcomes* (9-12.DA.CVT.1 and 9-12.DA.IM.1).	**Data and Analysis** ● DA.S: Storage - *Data can be composed of multiple data elements that relate to one another. For example, population data may contain information about age, gender, and height. People make choices about how data elements are organized and where data is stored. These choices affect cost, speed, reliability, accessibility, privacy, and integrity* (9-12.DA.S.1 and 9-12.DA.S.2). ● DA.CVT: Collection, Visualization, and Transformation - *Data is constantly collected or generated through automated processes that are not always evident, raising privacy concerns. The different collection methods and tools that are used influence the amount and quality of the data that is observed and recorded. People transform, generalize, simplify, and present large data sets in different ways to influence how other people interpret and understand the underlying information. Examples include visualization, aggregation, rearrangement, and application of mathematical operations* (9-12.DA.CVT.1). ● DA.IM: Inference and Models - *The accuracy of predictions or inferences depends upon the limitations of the computer model and the data the model is built upon. The amount, quality, and diversity of data and the features chosen can affect the quality of a model and ability to understand a system. Predictions or inferences are tested to validate models.* (9-12.DA.IM.1).

	Connections to other NVACS at this grade level
NVACS for Science	(9-12.DA.S.1) – SEP2, SEP4 (9-12.DA.S.2) – HS-ETS1-3, HS-LS2-7, HS-ETS1-2 & 1-3, HS-LS4-6, HS-ETS1-2 & 1-3, SEP8 (9-12.DA.CVT.1) – SEP2, HS-LS2-4, HS-LS2-1 & 2-2, HS-LS3-3, HS-LS4-3, HS-LS4-1, HS-LS4-6 (9-12.DA.IM.1) – SEP2, SEP4, SEP5, SEP8
NVACS for Mathematics	(9-12.DA.S.1) – SMP 4-7 (9-12.DA.CVT.1) – SMP 4 & 5 (9-12.DA.IM.1) – SMP 4 & 5
NVACS for ELA	(9-12.DA.S.2) – ELA RI.9-10.8 (9-12.DA.CVT.1) – ELA W.9-10.2a (9-12.DA.IM.1) – ELA W.9-10.2a
NVACS for Social Studies	None

Impacts of Computing

By the end of Grade 12, students who demonstrate understanding can:

Indicator	Standard
9-12.IC.C.1	Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.
9-12.IC.C.2	Test and refine computational artifacts to reduce bias and equity deficits.
9-12.IC.C.3	Demonstrate ways a given algorithm applies to problems across disciplines.
9-12.IC.C.4	Explain the potential impacts of artificial intelligence on society.
9-12.IC.SI.1	Use tools and methods for collaboration on a project to increase connectivity of people in different cultures and career fields.
9-12.IC.SLE.1	Explain the beneficial and harmful effects that intellectual property laws can have on innovation.
9-12.IC.SLE.2	Explain the privacy concerns related to the collection and generation of data through automated processes that may not be evident to users.
9-12.IC.SLE.3	Evaluate the social and economic implications of privacy in the context of safety, law, or ethics.

Practice Connection	Concept Connection
Practice 1. Fostering an Inclusive Computing Culture 1. *Include the unique perspectives of others and reflect on one's own perspectives when designing and developing computational products* (9-12.IC.C.4). 2. *Address the needs of diverse end users during the design process to produce artifacts with broad accessibility and usability* (9-12.IC.C.1 and 9-12.IC.C.2). **Practice 2. Collaborating Around Computing** 4. *Evaluate and select technological tools that can be used to collaborate on a project* (9-12.IC.SI.1). **Practice 3. Recognizing and Defining Computational Problems** 1. *Identify complex, interdisciplinary, real-world problems that can be solved computationally* (9-12.IC.C.3). **Practice 7. Communicating About Computing** 2. *Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose* (9-12.IC.SLE.2). 3. *Articulate ideas responsibly by observing intellectual property rights and giving appropriate attribution* (9-12.IC.SLE.1 and 9-12.IC.SLE.3).	**Impacts of Computing** ● IC.C: Culture - *The design and use of computing technologies and artifacts can improve, worsen, or maintain inequitable access to information and opportunities* (9-12.IC.C.1-4). ● IC.SI: Social Interactions - *Many aspects of society, especially careers, have been affected by the degree of communication afforded by computing. The increased connectivity between people in different cultures and in different career fields has changed the nature and content of many careers* (9-12.IC.SI.1). ● IC.SLE: Safety, Law, and Ethics - *Laws govern many aspects of computing, such as privacy, data, property, information, and identity. These laws can have beneficial and harmful effects, such as expediting or delaying advancements in computing and protecting or infringing upon people's rights. International differences in laws and ethics have implications for computing* (9-12.IC.SLE.1-3).

	Connections to other NVACS at this grade level
NVACS for Science	(9-12.IC.C.1) – ETS2.8 (9-12.IC.C.2) – SEP2, SEP3, SEP8 (9-12.IC.C.4) – SEP6, ETS2.8 (9-12.IC.SI.1) – SEP8 (9-12.IC.SLE.1) – SEP6, SEP 7, SEP8, HS-ETS1-3 (9-12.IC.SLE.3) – HS-ETS1-3, SEP7
NVACS for Mathematics	(9-12.IC.C.2) – SMP 4 (9-12.IC.C.3) – SMP 7 (9-12.IC.SI.1) – SMP 5
NVACS for ELA	(9-12.IC.C.1) – ELA RI.9-10.8 (9-12.IC.C.4) – ELA W.9-10.2 (9-12.IC.SI.1) – ELA SL.9-10.1b (9-12.IC.SLE.1) – ELA W.9-10.2 (9-12.IC.SLE.2) – ELA W.9-10.2 (9-12.IC.SLE.3) – ELA RI.9-10.8
NVACS for Social Studies	(9-12.IC.SLE.1-3) – Connect to financial literacy (risk)

Networks and the Internet

By the end of Grade 12, students who demonstrate understanding can:

Indicator	Standard
9-12.NI.NCO.1	Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.
9-12.NI.C.1	Give examples to illustrate how sensitive data can be affected by malware and other attacks.
9-12.NI.C.2	Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical impacts.
9-12.NI.C.3	Compare various security measures, considering tradeoffs between the usability and security of a computing system.
9-12.NI.C.4	Explain tradeoffs when selecting and implementing cybersecurity recommendations.

Practice Connection	Concept Connection
Practice 3. Recognizing and Defining Computational Problems *3. Evaluate whether it is appropriate and feasible to solve a problem computationally* (9-12.NI.C.2). **Practice 4. Developing and Using Abstractions** *1. Extract common features from a set of interrelated processes or complex phenomena* (9-12.NI.NCO.1). **Practice 6. Testing and Refining Computational Artifacts** *3. Evaluate and refine a computational artifact multiple times to enhance its performance, reliability, usability, and accessibility* (9-12.NI.C.3). **Practice 7. Communicating About Computing** *2. Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose* (9-12.NI.C.1 and 9-12.NI.C.4).	**Networks and the Internet** ● NI.NCO: Network, Communication, and Organization - *Network topology is determined, in part, by how many devices can be supported. Each device is assigned an address that uniquely identifies it on the network. The scalability and reliability of the Internet are enabled by the hierarchy and redundancy in networks* (9-12.NI.NCO.1). ● NI.C: Cybersecurity - *Network security depends on a combination of hardware, software, and practices that control access to data and systems. The needs of users and the sensitivity of data determine the level of security implemented* (9-12.NI.C.1-4).

	Connections to other NVACS at this grade level
NVACS for Science	(9-12.NI.NCO.1) – SEP8, HS-ETS1-1 (9-12.NI.C.1) – SEP2 (9-12.NI.C.2) – HS-ETS1-1, HS-ETS1-2 (9-12.NI.C.3) – HS-ETS1-3 (9-12.NI.C.4) – HS-ETS1-3
NVACS for Mathematics	None
NVACS for ELA	(9-12.NI.NCO.1) – ELA RI.9-10.8 (9-12.NI.C.1) – ELA RI.9-10.1 (9-12.NI.C.3) – ELA RI.6.9 (9-12.NI.C.4) – ELA W.9-10.2d
NVACS for Social Studies	(9-12.NI.C.1-4) – Connect to financial literacy (risk)

Grades 9-12 Advanced* Computer Science Standards

Algorithms and Programming

** These Advanced Computer Science Standards are considered to be higher level concepts that may be used by your advanced students, incorporated into upper level courses, and/or used in Career and Technical Education (CTE) programs. These are in addition to the 9-12 Computer Science Standards and are optional.*

By the end of Grade 12, students who demonstrate understanding can:

Indicator	Standard
A9-12.AP.A.1	Describe how artificial intelligence drives many software and physical systems.
A9-12.AP.A.2	Implement an artificial intelligence algorithm to play a game against a human opponent or solve a problem.
A9-12.AP.A.3	Use and adapt classic algorithms to solve computational problems.
A9-12.AP.A.4	Evaluate algorithms in terms of their efficiency, correctness, and clarity.
A9-12.AP.V.1	Compare and contrast fundamental data structures and their uses.
A9-12.AP.C.1	Illustrate the flow of execution of a recursive algorithm.
A9-12.AP.M.1	Construct solutions to problems using student-created components, such as procedures, modules and/or objects.
A9-12.AP.M.2	Analyze a large-scale computational problem and identify generalizable patterns that can be applied to a solution.
A9-12.AP.M.3	Demonstrate code reuse by creating programming solutions using libraries and APIs.
A9-12.AP.PD.1	Plan and develop programs for broad audiences using a software life cycle process.
A9-12.AP.PD.2	Explain security issues that might lead to compromised computer programs.
A9-12.AP.PD.3	Develop programs for multiple computing platforms.
A9-12.AP.PD.4	Use version control systems, integrated development environments (IDEs), and collaborative tools and practices (code documentation) in a group software project.
A9-12.AP.PD.5	Develop and use a series of test cases to verify that a program performs according to its design specifications.
A9-12.AP.PD.6	Modify an existing program to add additional functionality and discuss intended and unintended implications (e.g., breaking other functionality).
A9-12.AP.PD.7	Evaluate key qualities of a program through a process such as a code review.

A9-12.AP.PD.8	Compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.

Practice Connection	Concept Connection
Practice 2. Collaborating Around Computing *4. Evaluate and select technological tools that can be used to collaborate on a project* (A9-12.AP.PD.4). **Practice 3. Recognizing and Defining Computational Problems** *2. Decompose complex real-world problems into manageable subproblems that could integrate existing solutions or procedures* (A9-12.AP.C.1). **Practice 4. Developing and Using Abstractions** *1. Extract common features from a set of interrelated processes or complex phenomena* (A9-12.AP.M.2). *2. Evaluate existing technological functionalities and incorporate them into new designs* (A9-12.AP.A.3-4 and A9-12.AP.V.1). **Practice 5. Creating Computational Artifacts** *1. Plan the development of a computational artifact using an iterative process that includes reflection on and modification of the plan, taking into account key features, time and resource constraints, and user expectations* (A9-12.AP.PD.1). *2. Create a computational artifact for practical intent, personal expression, or to address a societal issue* (A9-12.AP.M.1 and A9-12.AP.PD.3). *3. Modify an existing artifact to improve or customize it* (A9-12.AP.A.2, A9-12.AP.M.3, and A9-12.AP.PD.6). **Practice 6. Testing and Refining Computational Artifacts** *1. Systematically test computational artifacts by considering all scenarios and using test cases* (A9-12.AP.PD.5). *3. Evaluate and refine a computational artifact multiple times to enhance its performance, reliability, usability, and accessibility* (A9-12.AP.PD.7). **Practice 7. Communicating About Computing** *2. Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose* (A9-12.AP.A.1, A9-12.AP.PD.2 and A9-12.AP.PD.8).	**Algorithms and Programming** ● AP.A: Algorithms - *People evaluate and select algorithms based on performance, reusability, and ease of implementation. Knowledge of common algorithms improves how people develop software, secure data, and store information* (A9-12.AP.A.1-4). ● AP.V: Variables - *Data structures are used to manage program complexity. Programmers choose data structures based on functionality, storage, and performance tradeoffs* (A9-12.AP.V.1). ● AP.C: Control - *Programmers consider tradeoffs related to implementation, readability, and program performance when selecting and combining control structures* (A9-12.AP.C.1). ● AP.M: Modularity - *Complex programs are designed as systems of interacting modules, each with a specific role, coordinating for a common overall purpose. These modules can be procedures within a program; combinations of data and procedures; or independent, but interrelated, programs. Modules allow for better management of complex tasks* (A9-12.AP.M.1-3). ● AP.PD: Program Development - *Diverse teams can develop programs with a broad impact through careful review and by drawing on the strengths of members in different roles. Design decisions often involve tradeoffs. The development of complex programs is aided by resources such as libraries and tools to edit and manage parts of the program. Systematic analysis is critical for identifying the effects of lingering bugs* (A9-12.AP.PD.1-8).

	Connections to other NVACS at this grade level
NVACS for Science	(A9-12.AP.A.1) – HS-ETS1-2 (A9-12.AP.C.1) – HS-ETS1-3, SEP7 (A9-12.AP.M.1) – HS-ETS1-2 (A9-12.AP.M.2) – HS-ETS1-4 (A9-12.AP.PD.1) – CCC4, HS-ETS1-3 (A9-12.AP.PD.3) – SEP8 (A9-12.AP.PD.4) – SEP5, SEP8 (A9-12.AP.PD.5) – SEP8
NVACS for Mathematics	(A9-12.AP.A.1) – SMP 1, 2, 4, 7, & 8 (A9-12.AP.V.1) – SMP 4, 5, & 7 (A9-12.AP.C.1) – SMP 2 & 3 (A9-12.AP.C.2) – SMP 4 (A9-12.AP.M.1) – SMP 2, 6, & 7 (A9-12.AP.PD.1) – SMP 1-4 (A9-12.AP.PD.3) – SMP 3 & 6 (A9-12.AP.PD.4) – SMP 4 & 5 (A9-12.AP.PD.5) – SMP 1, 2, 4, & 5
NVACS for ELA	(A9-12.AP.A.1) – W.9-11.2b (A9-12.AP.A.4) – RI.9-10.8 (A9-12.AP.V.1) – W.7.2a or RI.6.9 (A9-12.AP.M.1) – W.11-12.2a (A9-12.AP.M.2) – RI.11-12.3 (A9-12.AP.PD.1) – W.11-12.2b (A9-12.AP.PD.2) – W.11-12.2 (A9-12.AP.PD.7) – RI.9-10.8 (A9-12.AP.PD.8) – W.7.2a or RI.6.9
NVACS for Social Studies	None

Grades 9-12 Advanced* Computer Science Standards

Computing Systems

** These Advanced Computer Science Standards are considered to be higher level concepts that may be used by your advanced students, incorporated into upper level courses, and/or used in Career and Technical Education (CTE) programs. These are in addition to the 9-12 Computer Science Standards and are optional.*

By the end of Grade 12, students who demonstrate understanding can:

Indicator	Standard
A9-12.CS.HS.1	Categorize the roles of operating system software.
A9-12.CS.T.1	Illustrate ways computing systems implement logic, input, and output through hardware components.

Practice Connection	Concept Connection
Practice 7. Communicating About Computing *2. Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose* (A9-12.CS.HS.1 and A9-12.CS.T.1).	**Computing Systems** • CS.HS: Hardware and Software - *Levels of interaction exist between the hardware, software, and user of a computing system. The most common levels of software that a user interacts with include system software and applications. System software controls the flow of information between hardware components used for input, output, storage, and processing* (A9-12.CS.HS.1). • CS.T: Troubleshooting - *Troubleshooting complex problems involves the use of multiple sources when researching, evaluating, and implementing potential solutions. Troubleshooting also relies on experience, such as when people recognize that a problem is similar to one they have seen before or adapt solutions that have worked in the past* (A9-12.CS.T.1).

	Connections to other NVACS at this grade level
NVACS for Science	(A9-12.CS.HS.1) – SEP2, SEP8 (A9-12.CS.T.1) – SEP2, SEP8
NVACS for Mathematics	(A9-12.CS.CS.T.1) – SMP3
NVACS for ELA	None
NVACS for Social Studies	None

Grades 9-12 Advanced* Computer Science Standards

Data and Analysis

** These Advanced Computer Science Standards are considered to be higher level concepts that may be used by your advanced students, incorporated into upper level courses, and/or used in Career and Technical Education (CTE) programs. These are in addition to the 9-12 Computer Science Standards and are optional.*

By the end of Grade 12, students who demonstrate understanding can:

Indicator	Standard
A9-12.DA.CVT.1	Use data analysis tools and techniques to identify patterns in data representing complex systems.
A9-12.DA.CVT.2	Select data collection tools and techniques to generate data sets that support a claim or communicate information.
A9-12.DA.IM.1	Evaluate the ability of models and simulations to test and support the refinement of hypotheses.

Practice Connection	Concept Connection
Practice 4. Developing and Using Abstractions 1. *Extract common features from a set of interrelated processes or complex phenomena* (A9-12.DA.CVT.1). 4. *Model phenomena and processes and simulate systems to understand and evaluate potential outcomes* (A9-12.DA.IM.1). **Practice 7. Communicating About Computing** 2. *Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose* (A9-12.DA.CVT.2).	**Data and Analysis** • DA.CVT: Collection, Visualization, and Transformation - *Data is constantly collected or generated through automated processes that are not always evident, raising privacy concerns. The different collection methods and tools that are used influence the amount and quality of the data that is observed and recorded. People transform, generalize, simplify, and present large data sets in different ways to influence how other people interpret and understand the underlying information. Examples include visualization, aggregation, rearrangement, and application of mathematical operations* (A9-12.DA.CVT.1-2). • DA.IM: Inference and Models - *The accuracy of predictions or inferences depends upon the limitations of the computer model and the data the model is built upon. The amount, quality, and diversity of data and the features chosen can affect the quality of a model and ability to understand a system. Predictions or inferences are tested to validate models* (A9-12.DA.IM.1).

	Connections to other NVACS at this grade level
NVACS for Science	(A9-12.DA.CVT.1) – SEP2, HS-LS2-4, HS-LS2-1 & 2-2, HS-LS3-3, HS-LS4-3, HS-LS4-1, HS-LS4-6 (A9-12.DA.IM.1) – SEP2, SEP4, SEP5, SEP8
NVACS for Mathematics	(A9-12.DA.CVT.1) – SMP 4 & 5 (A9-12.DA.IM.1) – SMP 4 & 5
NVACS for ELA	(A9-12.DA.CVT.1) – RI.9-10.5 (A9-12.DA.CVT.2) – W.8.1b (A9-12.DA.IM.1) – RI.6.8
NVACS for Social Studies	None

Grades 9-12 Advanced* Computer Science Standards

Impacts of Computing

** These Advanced Computer Science Standards are considered to be higher level concepts that may be used by your advanced students, incorporated into upper level courses, and/or used in Career and Technical Education (CTE) programs. These are in addition to the 9-12 Computer Science Standards and are optional.*

By the end of Grade 12, students who demonstrate understanding can:

Indicator	Standard
A9-12.IC.C.1	Evaluate computational artifacts to maximize their beneficial effects and minimize harmful effects on society.
A9-12.IC.C.2	Evaluate the impact of equity, access, and influence on the distribution of computing resources in a global society.
A9-12.IC.C.3	Predict how computational innovations that have revolutionized aspects of our culture might evolve.
A9-12.IC.SLE.1	Debate laws and regulations that impact the development and use of software.

Practice Connection	Concept Connection
Practice 1. Fostering an Inclusive Computing Culture *2. Address the needs of diverse end users during the design process to produce artifacts with broad accessibility and usability* (A9-12.IC.C.1 and A9-12.IC.C.2). **Practice 3. Recognizing and Defining Computational Problems** *3. Evaluate whether it is appropriate and feasible to solve a problem computationally* (A9-12.IC.SLE.1). **Practice 6. Testing and Refining Computational Artifacts** *1. Systematically test computational artifacts by considering all scenarios and using test cases* (A9-12.IC.C.1). **Practice 7. Communicating About Computing** *2. Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose* (A9-12.IC.C.3). *3. Articulate ideas responsibly by observing intellectual property rights and giving appropriate attribution* (A9-12.IC.SLE.1).	**Impacts of Computing** ● IC.C: Culture - *The design and use of computing technologies and artifacts can improve, worsen, or maintain inequitable access to information and opportunities* (A9-12.IC.C.1-3). ● IC.SLE: Safety, Law, and Ethics - *Laws govern many aspects of computing, such as privacy, data, property, information, and identity. These laws can have beneficial and harmful effects, such as expediting or delaying advancements in computing and protecting or infringing upon people's rights. International differences in laws and ethics have implications for computing* (A9-12.IC.SLE.1).

	Connections to other NVACS at this grade level
NVACS for Science	(A9-12.IC.C.1) – ETS2.8 (A9-12.IC.C.2) – SEP2, SEP3, SEP8
NVACS for Mathematics	(A9-12.IC.C.2) – SMP 4 (A9-12.IC.C.3) – SMP 7
NVACS for ELA	(A9-12.IC.C.1) – RI.6.8 (A9-12.IC.C.2) – RI.6.8
NVACS for Social Studies	None

Grades 9-12 Advanced* Computer Science Standards

Networks and the Internet

** These Advanced Computer Science Standards are considered to be higher level concepts that may be used by your advanced students, incorporated into upper level courses, and/or used in Career and Technical Education (CTE) programs. These are in addition to the 9-12 Computer Science Standards and are optional.*

By the end of Grade 12, students who demonstrate understanding can:

Indicator	Standard
A9-12.NI.NCO.1	Describe the issues that impact network functionality (e.g., bandwidth, load, delay, and topology).
A9-12.NI.C.1	Compare ways software developers protect devices and information from unauthorized access.

Practice Connection	Concept Connection
Practice 7. Communicating About Computing *2. Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose* (A9-12.NI.NCO.1 and A9-12.NI.C.1).	**Networks and the Internet** ● NI.NCO: Network, Communication, and Organization - *Network topology is determined, in part, by how many devices can be supported. Each device is assigned an address that uniquely identifies it on the network. The scalability and reliability of the Internet are enabled by the hierarchy and redundancy in networks* (A9-12.NI.NCO.1). ● NI.C: Cybersecurity - *Network security depends on a combination of hardware, software, and practices that control access to data and systems. The needs of users and the sensitivity of data determine the level of security implemented* (A9-12.NI.C.1).

	Connections to other NVACS at this grade level
NVACS for Science	(A9-12.NI.NCO.1) – SEP8, HS-ETS1-1 (A9-12.NI.C.1) – SEP2
NVACS for Mathematics	None
NVACS for ELA	(A9-12.NI.NCO.1) – W.6.2 (A9-12.NI.C.1) – RI.6.9
NVACS for Social Studies	(A9-12.NI.C.1) – Connect to financial literacy (risk)

NEVADA ACADEMIC CONTENT STANDARDS

for

INTEGRATED TECHNOLOGY

Focus Areas

The Nevada K-12 Integrated Technology Standards represent seven core focus areas in technology education. There are four national indicators listed that represent specific ideas within each focus area. We have provided a brief overview of each focus area for further clarification, (see charts below).

Empowered Learner

Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.

Indicator	Description
A	Articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes.
B	Build networks and customize their learning environments in ways that support the learning process.
C	Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
D	Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies, and are able to transfer their knowledge to explore emerging technologies.

Digital Citizen

Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.

Indicator	Description
A	Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
B	Engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices.
C	Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
D	Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

Focus Areas

Knowledge Constructor

Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.

Indicator	Description
A	Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
B	Evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources.
C	Curate information from digital resources using a variety of tools and methods to create collection of artifacts that demonstrate meaningful connections or conclusions.
D	Build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions.

Innovative Designer

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.

Indicator	Description
A	Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems.
B	Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
C	Develop, test, and refine prototypes as part of a cyclical design process.
D	Exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems.

Computational Thinker

Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

Indicator	Description
A	Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.
B	Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
C	Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
D	Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Focus Areas

Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.

Indicator	Description
A	Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
B	Create original works or responsibly repurpose or remix digital resources into new creations.
C	Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations.
D	Publish or present content that customizes the message and medium for their intended audiences.

Global Collaborator

Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

Indicator	Description
A	Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
B	Use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.
C	Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
D	Explore local and global issues and use collaborative technologies to work with others to investigate solutions.

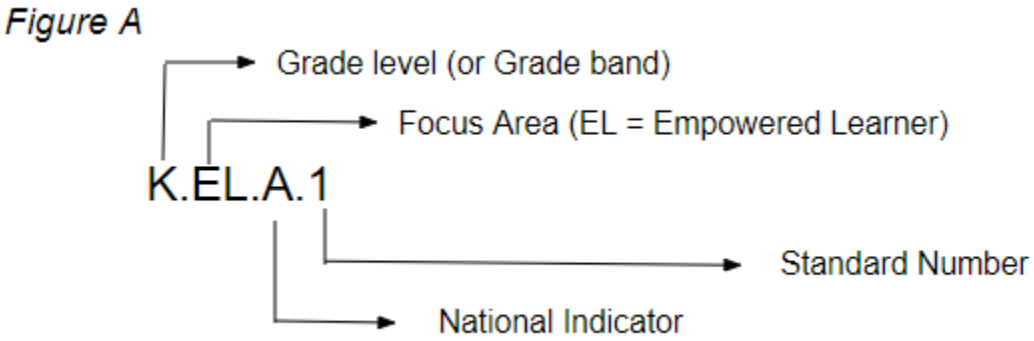
How to Read the Integrated Technology Standards

The *Nevada K-12 Integrated Technology Standards* are divided into Grades K, 1, 2, 3, 4, 5, 6-8, and 9-12.

The standards are divided into seven main focus areas that mirror the current national ISTE standards at the time of this publication. Those main focus areas include empowered learner, digital citizen, knowledge constructor, innovative designer, computational thinker, creative communicator, and global collaborator. Within each main focus area there is reference to the national indicator followed by the grade level standards. These standards are meant to be integrated into all subject areas and not as a stand-alone course.

The standards are coded as follows: (see Figure A).

Figure A



Kindergarten Integrated Technology Standards

Empowered Learner

Students who demonstrate understanding can:

Indicator	Standard
K.EL.A.1	Participate as a collaborative group to utilize digital and non-digital planning tools.
K.EL.D.1	Locate and use letter and number keys and the space bar.
K.EL.D.2	Demonstrate proper care and use of equipment.

ISTE Focus Area	National Indicator Connection
Focus 1. Empowered Learner (EL) *Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.*	**Empowered Learner (EL)** ● A: *Articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes* (K.EL.A.1). ● D*: Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies, and are able to transfer their knowledge to explore emerging technologies* (K.EL.D.1 and K.EL.D.2).

Kindergarten Integrated Technology Standards

Digital Citizen

Students who demonstrate understanding can:

Indicator	Standard
K.IC.C.1*	**Refer to Nevada Academic Content Standards for Computer Science* – Understand how computing devices have changed people's lives.
K.IC.SI.1*	**Refer to Nevada Academic Content Standards for Computer Science* - Exhibit good digital citizenship using technology safely, responsibly, and ethically.
K.DC.B.1	Describe potential dangers in digital environments and how to report potentially unsafe situations.
K.DC.C.1	Describe the meaning and responsibilities of digital citizenship.
K.NI.C.1*	**Refer to Nevada Academic Content Standards for Computer Science* – Explain that a password helps protect the privacy of information.

ISTE Focus Area	National Indicator Connection
Focus 2. Digital Citizen (DC) *Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.*	**Digital Citizen (DC)** ● A: *Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world* (K.IC.C.1 and K.IC.SI.1). ● B*: Engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices (K.DC.B.1).* ● C*: Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property (K.DC.C.1).* ● D*: Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online* (K.NI.C.1).

Kindergarten Integrated Technology Standards

Knowledge Constructor

Students who demonstrate understanding can:

Indicator	Standard
	There are no standards for this focus area at this grade level

ISTE Focus Area	National Indicator Connection
Focus 3. Knowledge Constructor (KC) *Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.*	**Knowledge Constructor (KC)** • *None*

Kindergarten Integrated Technology Standards

Innovative Designer

Students who demonstrate understanding can:

Indicator	Standard
K.ID.A.1	With teacher guidance, ask questions, suggest solutions, test ideas to solve problems, and share their learning.

ISTE Focus Area	National Indicator Connection
Focus 4. Innovative Designer (ID) *Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.*	**Innovative Designer (ID)** ● A: *Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems (K.ID.A.1).* **Common Core State Standards** ● ELA-Literacy.W.K.7 – *Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).*

Kindergarten Integrated Technology Standards

Computational Thinker

Students who demonstrate understanding can:

Indicator	Standard
K.CT.A.1	With teacher guidance, explore alternative solutions to and diverse perspectives on authentic problems using digital tools.
K.CT.C.1	With teacher guidance, work in a team to solve problems using digital tools.
K.CT.C.2	With teacher guidance, reboot a device correctly.
K.AP.A.1*	**Refer to Nevada Academic Content Standards for Computer Science* – Model daily processes by creating and following sets of step-by-step instructions (algorithms) to complete tasks.
K.AP.PD.1*	**Refer to Nevada Academic Content Standards for Computer Science* – Identify and fix (debug) errors in a sequence of instructions (algorithms) that includes loops.

ISTE Focus Area	National Indicator Connection
Focus 5. Computational Thinker (CT) *Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.*	**Computational Thinker (CT)** ● A: *Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions* (K.CT.A.1). ● C*: Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving (K.CT.C.1 and K.CT.C.2).* ● D*: Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions* (K.AP.A.1 and K.AP.PD.1).

Kindergarten Integrated Technology Standards

Creative Communicator

Students who demonstrate understanding can:

Indicator	Standard
	There are no standards for this focus area at this grade level

ISTE Focus Area	National Indicator Connection
Focus 6. Creative Communicator (CC) *Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.*	**Creative Communicator (CC)** • *None*

Kindergarten Integrated Technology Standards

Global Collaborator

Students who demonstrate understanding can:

Indicator	Standard
	There are no standards for this focus area at this grade level

ISTE Focus Area	National Indicator Connection
Focus 7. Global Collaborator (GC) *Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.*	**Global Collaborator (GC)** • *None*

Grade 1 Integrated Technology Standards

Empowered Learner

Students who demonstrate understanding can:

Indicator	Standard
1.EL.B.1	With teacher guidance, create a non-digital personal learning network of peers who can provide support.
1.EL.D.1	Locate and use letter, number, punctuation, and use of special function keys (e.g. shift, backspace, delete).

ISTE Focus Area	National Indicator Connection
Focus 1. Empowered Learner (EL) *Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.*	**Empowered Learner (EL)** ● B*: Build networks and customize their learning environments in ways that support the learning process* (1.EL.B.1). ● D*: Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies, and are able to transfer their knowledge to explore emerging technologies* (1.EL.D.1).

Grade 1 Integrated Technology Standards

Digital Citizen

Students who demonstrate understanding can:

Indicator	Standard
1.DC.C.1	Articulate what is allowed and what is not allowed at school when using technology.
1.NI.C.1*	* *Refer to Nevada Academic Content Standards for Computer Science* – 1.NI.C.1: Explain why we keep personal information (e.g., name, location, phone number, home address) private.

ISTE Focus Area	National Indicator Connection
Focus 2. Digital Citizen (DC) *Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.*	**Digital Citizen (DC)** ● C: *Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property* (1.DC.C.1). ● D*: Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online* (1.NI.C.1).

Grade 1 Integrated Technology Standards

Knowledge Constructor

Students who demonstrate understanding can:

Indicator	Standard
1.KC.A.1	Collaborate with others using digital resources to learn about high interest topics.

ISTE Focus Area	National Indicator Connection
Focus 3. Knowledge Constructor (KC) *Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.*	**Knowledge Constructor (KC)** ● A: *Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits* (1.KC.A.1).

Grade 1 Integrated Technology Standards

Innovative Designer

Students who demonstrate understanding can:

Indicator	Standard
1.ID.C.1	Use a design process to develop ideas or creations, and they test their design and redesign if necessary.
1.ID.D.1	Demonstrate perseverance when working to complete a challenging task.

ISTE Focus Area	National Indicator Connection
Focus 4. Innovative Designer (ID) *Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.*	**Innovative Designer (ID)** ● C: *Develop, test, and refine prototypes as part of a cyclical design process* (1.ID.C.1). ● D: *Exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems* (1.ID.D.1).

Grade 1 Integrated Technology Standards

Computational Thinker

Students who demonstrate understanding can:

Indicator	Standard
1.CT.A.1	With teacher guidance, use data to answer an authentic problem using digital tools.
1.CT.B.1	With teacher guidance, identify patterns and predict possibilities with classroom data using digital tools.
1.CT.C.1	With teacher guidance, identify and describe simple hardware and software problems (e.g., headphones, keyboard, and/or mouse not plugged into the port, volume too soft/loud).

ISTE Focus Area	National Indicator Connection
Focus 5. Computational Thinker (CT) *Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.*	**Computational Thinker (CT)** ● A: *Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.* (1.CT.A.1). ● B: *Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.* (1.CT.B.1). ● C: *Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving* (1.CT.C.1).

Grade 1 Integrated Technology Standards

Creative Communicator

Students who demonstrate understanding can:

Indicator	Standard
1.CC.A.1	With teacher guidance, choose different tools for creating something new or for communicating with others.
1.CC.B.1	With teacher guidance, create an original work using a variety of digital tools as a means of personal or group expression.

ISTE Focus Area	National Indicator Connection
Focus 6. Creative Communicator (CC) *Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.*	**Creative Communicator (CC)** ● A: *Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication* (1.CC.A.1). ● B: *Create original works or responsibly repurpose or remix digital resources into new creations* (1.CC.B.1).

Grade 1 Integrated Technology Standards

Global Collaborator

Students who demonstrate understanding can:

Indicator	Standard
1.GC.A.1	With teacher guidance, use digital tools to work with friends and with people outside their neighborhood, city, and beyond.

ISTE Focus Area	National Indicator Connection
Focus 7. Global Collaborator (GC) *Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.*	**Global Collaborator (GC)** ● A: *Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning* (1.GC.A.1).

Grade 2 Integrated Technology Standards

Empowered Learner

Students who demonstrate understanding can:

Indicator	Standard
2.EL.A.1	With teacher guidance, utilize digital and non-digital planning tools.
2.EL.D.1	Master location and use of special function keys (e.g., shift, backspace, delete)
2.EL.D.2	Demonstrate the use of drag and drop, copy, paste, undo, and editing and correction techniques.

ISTE Focus Area	National Indicator Connection
Focus 1. Empowered Learner (EL) *Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.*	**Empowered Learner (EL)** ● A: *Articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes* (2.EL.A.1). ● *D: Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies, and are able to transfer their knowledge to explore emerging technologies* (2.EL.D.1 and 2.EL.D.2).

Grade 2 Integrated Technology Standards

Digital Citizen

Students who demonstrate understanding can:

Indicator	Standard
2.DC.C.1	Make responsible decisions – grounded in knowledge of digital safety and security best practices.
2.NI.C.1*	* *Refer to Nevada Academic Content Standards for Computer Science* – 2.NI.C.1: Explain what passwords are and why we use them; use strong passwords to protect devices and information from unauthorized access.

ISTE Focus Area	National Indicator Connection
Focus 2. Digital Citizen (DC) *Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.*	**Digital Citizen (DC)** ● C: *Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property* (2.DC.C.1). ● *D: Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.* (2.NI.C.1).

Grade 2 Integrated Technology Standards

Knowledge Constructor

Students who demonstrate understanding can:

Indicator	Standard
2.KC.A.1	Identify and organize keywords and use multiple sources used to answer an essential question.
2.KC.D.1	Use digital models and simulations to explore complex systems and issues.

ISTE Focus Area	National Indicator Connection
Focus 3. Knowledge Constructor (KC) *Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.*	**Knowledge Constructor (KC)** ● A: *Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits* (2.KC.A.1). ● D: *Build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions* (2.KC.D.1).

Innovative Designer

Students who demonstrate understanding can:

Indicator	Standard
2.ID.B.1	Plan and manage projects using a digital and/or non-digital planning tool.

ISTE Focus Area	National Indicator Connection
Focus 4. Innovative Designer (ID) *Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.*	**Innovative Designer (ID)** ● B: *Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks* (2.ID.B.1).

Grade 2 Integrated Technology Standards

Computational Thinker

Students who demonstrate understanding can:

Indicator	Standard
2.CT.B.1	Identify patterns and predict possibilities with classroom data using digital tools.

ISTE Focus Area	National Indicator Connection
Focus 5. Computational Thinker (CT) *Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.*	**Computational Thinker (CT)** ● B: *Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.* (2.CT.B.1).

Grade 2 Integrated Technology Standards

Creative Communicator

Students who demonstrate understanding can:

Indicator	Standard
2.CC.C.1	With teacher guidance, communicate information and ideas to an intended audience using digital text, images, and audio.

ISTE Focus Area	National Indicator Connection
Focus 6. Creative Communicator (CC) *Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.*	**Creative Communicator (CC)** ● C: *Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulation* (2.CC.C.1).

Grade 2 Integrated Technology Standards

Global Collaborator

Students who demonstrate understanding can:

Indicator	Standard
2.GC.B.1	With teacher guidance, use technology to communicate with others and to look at problems from different perspectives.
2.GC.C.1	With teacher guidance, take on different team roles and use age-appropriate technologies to complete projects.
2.GC.D.1	With teacher guidance, use age-appropriate technologies to work together to understand problems and suggest solutions.

ISTE Focus Area	National Indicator Connection
Focus 7. Global Collaborator (GC) *Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.*	**Global Collaborator (GC)** ● B: *Use collaborative technologies to work with others, including peers, experts, or community members, to examine issues and problems from multiple viewpoints* (2.GC.B.1). ● C: *Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal* (2.GC.C.1). ● D: *Explore local and global issues and use collaborative technologies to work with others to investigate solutions* (2.GC.D.1).

Grade 3 Integrated Technology Standards

Empowered Learner

Students who demonstrate understanding can:

Indicator	Standard
3.EL.A.1	Independently utilize digital and non-digital planning tools.
3.EL.D.1	Demonstrate appropriate touch (blind) typing with speed and accuracy.

ISTE Focus Area	National Indicator Connection
Focus 1. Empowered Learner (EL) *Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.*	**Empowered Learner (EL)** ● A: *Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes* (3.EL.A.1). ● *D: Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies, and are able to transfer their knowledge to explore emerging technologies* (3.EL.D.1). ● *ELA-Literacy.W.3.6 – With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others (3.EL.D.1).*

Grade 3 Integrated Technology Standards

Digital Citizen

Students who demonstrate understanding can:

Indicator	Standard
3.DC.A.1	Demonstrate an understanding of the role an online identity plays in the digital world and learn the permanence of their decisions when interacting online.
3.DC.B.1	Describe codes of conduct for using technology at school and the consequences for breaking those rules.
3.IC.SLE.1*	* *Refer to Nevada Academic Content Standards for Computer Science* – 3.IC.SLE1: Identify safe and unsafe examples of online communications.

ISTE Focus Area	National Indicator Connection
Focus 2. Digital Citizen (DC) *Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.*	**Digital Citizen (DC)** ● A: *Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world* (3.DC.A.1). ● B*: Engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices (3.DC.B.1).* ● D*: Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.* (3.IC.SLE.1).

Grade 3 Integrated Technology Standards

Knowledge Constructor

Students who demonstrate understanding can:

Indicator	Standard
3.KC.B.1	With teacher guidance, become familiar with age-appropriate criteria for evaluating digital content.
3.KC.C.1	Organize information and make meaningful connections between resources.
3.KC.D.1	Create essential questions to guide investigation of a real-world problem using digital resources.

ISTE Focus Area	National Indicator Connection
Focus 3. Knowledge Constructor (KC) *Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.*	**Knowledge Constructor (KC)** ● B: *Evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources* (3.KC.B.1). ● C: *Curate information from digital resources using a variety of tools and methods to create collection of artifacts that demonstrate meaningful connections or conclusions* (3.KC.C.1). ● D: *Build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions* (3.KC.D.1).

Grade 3 Integrated Technology Standards

Innovative Designer

Students who demonstrate understanding can:

Indicator	Standard
3.ID.A.1	Explore and practice how a design process works to generate ideas, consider solutions, plan to solve a problem, or create innovative products that are shared with others.
3.ID.B.1	Describe a variety of ways to interact and contribute to a digital product.

ISTE Focus Area	National Indicator Connection
Focus 4. Innovative Designer (ID) *Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.*	**Innovative Designer (ID)** ● A: *Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems* (3.ID.A.1). ● B: *Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks* (3.ID.B.1).

Grade 3 Integrated Technology Standards

Computational Thinker

Students who demonstrate understanding can:

Indicator	Standard
3.CT.C.1	Work in a team to solve problems using digital tools.
3.CT.C.2	With teacher guidance, identify and describe the cause of hardware (e.g., wiring), connectivity (e.g., no internet connection), and software (e.g., frozen screen) problems.

ISTE Focus Area	National Indicator Connection
Focus 5. Computational Thinker (CT) *Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.*	**Computational Thinker (CT)** ● C: *Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving* (3.CT.C.1 and 3.CT.C.2).

Grade 3 Integrated Technology Standards

Creative Communicator

Students who demonstrate understanding can:

Indicator	Standard
3.CC.A.1	Describe appropriate media and formats for specific audiences.

ISTE Focus Area	National Indicator Connection
Focus 6. Creative Communicator (CC) *Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.*	**Creative Communicator (CC)** ● A: *Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication* (3.CC.A.1).

Grade 3 Integrated Technology Standards

Global Collaborator

Students who demonstrate understanding can:

Indicator	Standard
3.GC.A.1	Explore alternative solutions to and diverse perspectives on authentic problems and propose a solution using digital tools.
3.GC.D.1	Work with others using collaborative technologies to explore local and global issues.

ISTE Focus Area	National Indicator Connection
Focus 7. Global Collaborator (GC) *Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.*	**Global Collaborator (GC)** ● A: *Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning* (3.GC.A.1). ● D: *Explore local and global issues and use collaborative technologies to work with others to investigate solutions* (3.GC.D.1).

Grade 4 Integrated Technology Standards

Empowered Learner

Students who demonstrate understanding can:

Indicator	Standard
4.EL.A.1	With teacher guidance, develop learning goals, select tools to achieve them, and reflect on and revise the learning process as needed to achieve goals.
4.EL.B.1	Create a digital or non-digital personal learning network of peers who can provide support.
4.EL.C.1	Seek feedback from both people and digital tools, and use age-appropriate technology to share learning.

ISTE Focus Area	National Indicator Connection
Focus 1. Empowered Learner (EL) *Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.*	**Empowered Learner (EL)** ● A: *Articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes* (4.EL.A.1). ● *B: Build networks and customize their learning environments in ways that support the learning process* (4.EL.B.1). ● C: *Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways* (4.EL.C.1).

Grade 4 Integrated Technology Standards

Digital Citizen

Students who demonstrate understanding can:

Indicator	Standard
4.DC.B.1	Practice and encourage others in a safe, legal, and ethical behavior when using technology and interacting online.
4.DC.C.1	Demonstrate how to paraphrase the information learned from online sources into their own words.

ISTE Focus Area	National Indicator Connection
Focus 2. Digital Citizen (DC) *Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.*	**Digital Citizen (DC)** ● B*: Engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices (4.DC.B.1).* ● C*: Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property* (4.DC.C.1).

Knowledge Constructor

Students who demonstrate understanding can:

Indicator	Standard
4.KC.A.1	Use keywords to search, organize, locate, and synthesize information in multiple sources to create an original product.

ISTE Focus Area	National Indicator Connection
Focus 3. Knowledge Constructor (KC) *Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.*	**Knowledge Constructor (KC)** ● A: *Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits* (4.KC.A.1).

Innovative Designer

Students who demonstrate understanding can:

Indicator	Standard
4.ID.A.1	Demonstrate how a design process works to generate ideas, consider solutions, plan to solve a problem, or create innovative products that are shared with others.
4.ID.D.1	Demonstrate perseverance when working with open-ended problems.

ISTE Focus Area	National Indicator Connection
Focus 4. Innovative Designer (ID) *Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.*	**Innovative Designer (ID)** ● A: *Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems* (4.ID.A.1). ● D: *Exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems* (4.ID.D.1).

Grade 4 Integrated Technology Standards

Computational Thinker

Students who demonstrate understanding can:

Indicator	Standard
4.CT.B.1	Identify and represent trends and make predictions using classroom data.

ISTE Focus Area	National Indicator Connection
Focus 5. Computational Thinker (CT) *Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.*	**Computational Thinker (CT)** ● B: *Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making* (4.CT.B.1).

Grade 4 Integrated Technology Standards

Creative Communicator

Students who demonstrate understanding can:

Indicator	Standard
4.CC.A.1	Demonstrate appropriate media and formats for specific audiences.
4.CC.B.1	Create an original, digital work as a form of personal or group expression.
4.CC.C.1	Communicate information and ideas to an intended audience using digital text, images, and audio.

ISTE Focus Area	National Indicator Connection
Focus 6. Creative Communicator (CC) *Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.*	**Creative Communicator (CC)** ● A: *Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication* (4.CC.A.1). ● B: *Create original works or responsibly repurpose or remix digital resources into new creations* (4.CC.B.1). ● C: *Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations* (4.CC.C.1).

Grade 4 Integrated Technology Standards

Global Collaborator

Students who demonstrate understanding can:

Indicator	Standard
4.GC.C.1	Perform a variety of roles within a team using age-appropriate technology to complete a project or solve a problem.

ISTE Focus Area	National Indicator Connection
Focus 7. Global Collaborator (GC) *Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.*	**Global Collaborator (GC)** ● C: *Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal* (4.GC.C.1).

Grade 5 Integrated Technology Standards

Empowered Learner

Students who demonstrate understanding can:

Indicator	Standard
5.EL.A.1	Develop learning goals, select the technology tools to achieve them, and reflect on and revise the learning process as needed to achieve goals.
5.EL.D.1	Demonstrate proficient touch (blind) typing with speed and accuracy.

ISTE Focus Area	National Indicator Connection
Focus 1. Empowered Learner (EL) *Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.*	**Empowered Learner (EL)** ● A: *Articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes* (5.EL.A.1). ● D: *Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways* (5.EL.D.1). ● *ELA-Literacy.W.3.6 – With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others (5.EL.D.1)*

Grade 5 Integrated Technology Standards

Digital Citizen

Students who demonstrate understanding can:

Indicator	Standard
5.DC.A.1	Understand the notion of “digital footprint” and the permanence and traceability associated with online communication (e.g., email, social media).

ISTE Focus Area	National Indicator Connection
Focus 2. Digital Citizen (DC) *Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.*	**Digital Citizen (DC)** ● A*: Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world (5.DC.A.1).*

Grade 5 Integrated Technology Standards

Knowledge Constructor

Students who demonstrate understanding can:

Indicator	Standard
5.KC.B.1	Explain the importance of using more than one source and recognize possible bias in digital resources.
5.KC.D.1	Propose solutions to real-world problems using collected data and digital tools.

ISTE Focus Area	National Indicator Connection
Focus 3. Knowledge Constructor (KC) *Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.*	**Knowledge Constructor (KC)** ● B: *Evaluate the accuracy, perspective, credibility, and relevance of infomration, media, data, or other resources* (5.KC.B.1). ● D: *Build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions* (5.KC.D.1).

Grade 5 Integrated Technology Standards

Innovative Designer

Students who demonstrate understanding can:

Indicator	Standard
5.ID.B.1	Plan and manage projects using digital planning tools.

ISTE Focus Area	National Indicator Connection
Focus 4. Innovative Designer (ID) *Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.*	**Innovative Designer (ID)** ● B: *Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks* (5.ID.B.1).

Grade 5 Integrated Technology Standards

Computational Thinker

Students who demonstrate understanding can:

Indicator	Standard
	There are no standards for this focus area at this grade level

ISTE Focus Area	National Indicator Connection
Focus 5. Computational Thinker (CT) *Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.*	**Computational Thinker (CT)** ● *Please refer to the Nevada Academic Content Standards for Computer Science*

Grade 5 Integrated Technology Standards

Creative Communicator

Students who demonstrate understanding can:

Indicator	Standard
5.CC.A.1	Recognize and utilize appropriate media and formats for specific audiences.
5.CC.B.1	Create original works and learn strategies for responsibly remixing or repurposing to create new artifacts.

ISTE Focus Area	National Indicator Connection
Focus 6. Creative Communicator (CC) *Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.*	**Creative Communicator (CC)** ● A: *Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication* (5.CC.A.1). ● B: *Create original works or responsibly repurpose or remix digital resources into new creations* (5.CC.B.1).

Grade 5 Integrated Technology Standards

Global Collaborator

Students who demonstrate understanding can:

Indicator	Standard
5.GC.B.1	Use collaborative technologies to connect with others, including peers, experts, and community members, to explore different points of view on various topics.

ISTE Focus Area	National Indicator Connection
Focus 7. Global Collaborator (GC) *Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.*	**Global Collaborator (GC)** ● B: *Use collaborative technologies to work with others, including peers, experts, or community members, to examine issues and problems from multiple viewpoints* (5.GC.B.1).

Empowered Learner

Students who demonstrate understanding can:

Indicator	Standard
6-8.EL.A.1	Articulate personal learning goals, select and manage appropriate technologies to achieve them, and reflect on their successes and areas of improvement in working toward their goals.
6-8.EL.B.1	Identify and develop online networks within school policy, and customize their learning environments in ways that support their learning, in collaboration with an educator.
6-8.EL.C.1	Actively seek performance feedback from people, including teachers, and from functionalities embedded in digital tools to improve their learning process, and they select technology to demonstrate their learning in a variety of ways.
6-8.EL.D.1	Navigate a variety of technologies and transfer their knowledge and skills to learn how to use new technologies.

ISTE Focus Area	National Indicator Connection
Focus 1. Empowered Learner (EL) *Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.*	**Empowered Learner (EL)** ● A: *Articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes* (6-8.EL.A.1). ● B*: Build networks and customize their learning environments in ways that support the learning process* (6-8.EL.B.1). ● C: *Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways* (6-8.EL.C.1). ● D: *Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies, and are able to transfer their knowledge to explore emerging technologies* (6-8.EL.D.1).

Digital Citizen

Students who demonstrate understanding can:

Indicator	Standard
6-8.DC.A.1	Describe how to manage digital identities and reputations within school policy, including demonstrating an understanding of how digital actions may have positive or negative implications for their future.
6-8.DC.B.1	Demonstrate and advocate for positive, safe, legal, and ethical habits when using technology and when interacting with others online.
6-8.DC.B.2	Demonstrate an awareness of potential dangers while online (e.g., cyberbullying, child predators, phishing) and understand how to get help.
6-8.DC.C.1	Advocate and demonstrate a respect for intellectual property with both print and digital media—including copyright, permission and fair use—by creating a variety of media products that include appropriate citation and attribution elements.
6-8.DC.D.1	Demonstrate an understanding of what personal data is and how to keep it private and secure, including the awareness of terms such as encryption, HTTPS, password strength, cookies, phishing, and computer viruses; understand the limitations of data management and how data-collection technologies work.

ISTE Focus Area	National Indicator Connection
Focus 2. Digital Citizen (DC) *Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.*	**Digital Citizen (DC)** ● A*: Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world (6-8.DC.A.1).* ● B*: Engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices (6-8.DC.B.1 and 6-8.DC.B.2).* ● C: *Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property (6-8.DC.C.1).* ● D*: Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online (6-8.DC.D.1).*

Knowledge Constructor

Students who demonstrate understanding can:

Indicator	Standard
6-8.KC.A.1	Demonstrate and practice the ability to effectively utilize research strategies to locate appropriate digital resources in support of their learning.
6-8.KC.B.1	Practice and demonstrate the ability to evaluate resources for accuracy, perspective, credibility, and relevance.
6-8.KC.C.1	Locate and collect resources from a variety of sources and organize assets into collections for a wide range of projects and purposes.
6-8.KC.D.1	Explore real-world issues and problems through inquiry and analysis, develop ideas, actively create solutions for them, and evaluate and revise through the use of digital tools.

ISTE Focus Area	National Indicator Connection
Focus 3. Knowledge Constructor (KC) *Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.*	**Knowledge Constructor (KC)** ● A: *Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits* (6-8.KC.A.1). ● B: *Evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources* (6-8.KC.B.1). ● C: *Curate information from digital resources using a variety of tools and methods to create collection of artifacts that demonstrate meaningful connections or conclusions* (6-8.KC.C.1). ● D: *Build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions* (6-8.KC.D.1).

Innovative Designer

Students who demonstrate understanding can:

Indicator	Standard
6-8.ID.A.1	Engage in a design process and employ it to inquire and analyze, generate ideas, create innovative products or solve authentic problems, and evaluate the process to revise if needed.
6-8.ID.B.1	Select and use digital tools to support a design process and expand their understanding to identify constraints, trade-offs, and to weigh risks.
6-8.ID.C.1	Engage in a design process to inquire and analyze, develop ideas, test and revise prototypes, embracing the cyclical process of trial and error, and understanding problems or setbacks as potential opportunities for improvement.
6-8.ID.D.1	Demonstrate an ability to persevere and handle greater ambiguity as they work to solve open-ended problems.

ISTE Focus Area	National Indicator Connection
Focus 4. Innovative Designer (ID) *Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.*	**Innovative Designer (ID)** ● A: *Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems* (6-8.ID.A.1). ● B: *Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks* (6-8.ID.B.1). ● C: *Develop, test, and refine prototypes as part of a cyclical design process* (6-8.ID.C.1). ● D: *Exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems* (6-8.ID.D.1).

Computational Thinker

Students who demonstrate understanding can:

Indicator	Standard
6-8.CT.A.1	Practice defining problems to solve by computing for data analysis, modeling, or algorithmic thinking.
6-8.CT.B.1	Find or organize data and use technology to analyze and represent the data to solve problems and make decisions.
6-8.CT.C.1	Break problems into component parts, identify key pieces, and use that information to problem solve.
6-8.CT.D.1	Demonstrate an understanding of how automation works and use algorithmic thinking to design and automate solutions.

ISTE Focus Area	National Indicator Connection
Focus 5. Computational Thinker (CT) *Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.*	**Computational Thinker (CT)** ● A: *Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions* (6-8.CT.A.1). ● B: *Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making* (6-8.CT.B.1). ● C: *Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving* (6-8.CT.C.1). ● D: *Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions* (6-8.CT.D.1).

Creative Communicator

Students who demonstrate understanding can:

Indicator	Standard
6-8.CC.A.1	Select appropriate platforms and tools to create, share, and communicate their work effectively.
6-8.CC.A.2	Understand and demonstrate how to construct an email to the appropriate audience, including replying to individual, groups, BCC, and CC.
6-8.CC.B.1	Create original works and apply strategies for responsibly remixing or repurposing to create new artifacts.
6-8.CC.C.1	Communicate complex ideas clearly using various digital tools to convey the concepts textually, visually, graphically, etc.
6-8.CC.D.1	Publish or present content designed for specific audiences and select platforms that will effectively convey their ideas to those audiences.

ISTE Focus Area	National Indicator Connection
Focus 6. Creative Communicator (CC) *Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.*	**Creative Communicator (CC)** ● A: *Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication* (6-8.CC.A.1 and 6-8.CC.A.2). ● B: *Create original works or responsibly repurpose or remix digital resources into new creations* (6-8.CC.B.1). ● C: *Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations* (6-8.CC.C.1). ● D: *Publish or present content that customizes the message and medium for their intended audiences* (6-8.CC.D.1).

Global Collaborator

Students who demonstrate understanding can:

Indicator	Standard
6-8.GC.A.1	Use digital tools to interact with others to develop a richer understanding of different perspectives and cultures.
6-8.GC.B.1	Use collaborative technologies to connect with others, including peers, experts, and community members, to learn about issues and problems or to gain broader perspectives.
6-8.GC.C.1	Determine their role on a team to meet goals, based on their knowledge of technology and content, as well as personal preference.
6-8.GC.D.1	Select collaborative technologies and use them to work with others to investigate and develop solutions related to local and global issues.

ISTE Focus Area	National Indicator Connection
Focus 7. Global Collaborator (GC) *Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.*	**Global Collaborator (GC)** ● A: *Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning* (6-8.GC.A.1). ● B: *Use collaborative technologies to work with others, including peers, experts, or community members, to examine issues and problems from multiple viewpoints* (6-8.GC.B.1). ● C: *Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal* (6-8.GC.C.1). ● D: *Explore local and global issues and use collaborative technologies to work with others to investigate solutions* (6-8.GC.D.1).

Empowered Learner

Students who demonstrate understanding can:

Indicator	Standard
9-12.EL.A.1	Actively assimilate and revise personal and career goals, select and manage current and emerging technologies to achieve them, and reflect on their successes and areas of improvement in working toward their goals.
9-12.EL.B.1	Consistently engage in online social networks as a means to access and promote lifelong learning in collaboration with global peers.
9-12.EL.C.1	Regularly revise their work habits and attitudes based on feedback from others and from functionalities embedded in digital tools to improve their learning process, and they select or creatively use technologies to share their learning in ways that are useful to others.
9-12.EL.D.1	Successfully use a variety of existing technologies to develop criteria and identify new digital tools and resources from emerging technologies to accomplish a defined task with fluency and ease.

ISTE Focus Area	National Indicator Connection
Focus 1. Empowered Learner (EL) *Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.*	**Empowered Learner (EL)** ● A: *Articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes* (9-12.EL.A.1). ● B*: Build networks and customize their learning environments in ways that support the learning process* (9-12.EL.B.1). ● C: *Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways* (9-12.EL.C.1). ● D: *Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use, and troubleshoot current technologies, and are able to transfer their knowledge to explore emerging technologies* (9-12.EL.D.1).

Digital Citizen

Students who demonstrate understanding can:

Indicator	Standard
9-12.DC.A.1	Analyze their digital identities and reputations within school policy to consider social media's impact on society, including demonstrating an understanding of how digital actions may have positive or negative implications for their future.
9-12.DC.B.1	Demonstrate and advocate for positive, safe, legal, and ethical habits when using technology and when interacting with others online.
9-12.DC.B.2	Distinguish potential dangers while online (e.g., malicious actors, phishing, impersonation) to prevent, detect, and combat cybersecurity threats while practicing safe and secure techniques, tactics, and practices recognizing cybersecurity is everyone's responsibility.
9-12.DC.C.1	Advocate and demonstrate a respect for intellectual property with both print and digital media—including copyright, permission and fair use—by creating a variety of media products that include appropriate citation and attribution elements.
9-12.DC.D.1	Demonstrate an understanding of what personal data is and how to keep it private and secure, including the awareness of terms such as encryption, HTTPS, password strength, cookies, phishing, and computer viruses; understand the limitations of data management and how data-collection technologies work.

ISTE Focus Area	National Indicator Connection
Focus 2. Digital Citizen (DC) *Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.*	**Digital Citizen (DC)** ● A*: Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world (9-12.DC.A.1).* ● B*: Engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices (9-12.DC.B.1 and 6-8.DC.B.2).* ● C*: Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property (9-12.DC.C.1).* ● D*: Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online (9-12.DC.D.1).*

Knowledge Constructor

Students who demonstrate understanding can:

Indicator	Standard
9-12.KC.A.1	Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
9-12.KC.B.1	Evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources in the school and career setting.
9-12.KC.C.1	Curate information from digital resources, including online databases and catalogs, for research using a variety of tools and methods to create collections of artifacts that support their learning and career goals.
9-12.KC.D.1	Explore real-world issues and problems through inquiry and analysis, develop ideas, actively create solutions for them, and evaluate and revise through the use of digital tools.

ISTE Focus Area	National Indicator Connection
Focus 3. Knowledge Constructor (KC) *Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.*	**Knowledge Constructor (KC)** ● A: *Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits* (9-12.KC.A.1). ● B: *Evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources* (9-12.KC.B.1). ● C: *Curate information from digital resources using a variety of tools and methods to create collection of artifacts that demonstrate meaningful connections or conclusions* (9-12.KC.C.1). ● D: *Build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions* (9-12.KC.D.1).

Innovative Designer

Students who demonstrate understanding can:

Indicator	Standard
9-12.ID.A.1	Engage in a design process and employ it to inquire and analyze, generate ideas, create innovative products or solve authentic problems, and evaluate the process to revise if needed.
9-12.ID.B.1	Creatively use digital tools to support a design process and expand their understanding to identify constraints, trade-offs, and to weigh risks.
9-12.ID.C.1	Engage in a cyclical design process to inquire and analyze, develop ideas, test, and revise prototypes, presenting finished products and best practices learned during the development.
9-12.ID.D.1	Demonstrate an ability to persevere and handle greater ambiguity as they work to solve open-ended problems.

ISTE Focus Area	National Indicator Connection
Focus 4. Innovative Designer (ID) *Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.*	**Innovative Designer (ID)** ● A: *Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems* (9-12.ID.A.1). ● B: *Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks* (9-12.ID.B.1). ● C: *Develop, test, and refine prototypes as part of a cyclical design process* (9-12.ID.C.1). ● D: *Exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems* (9-12.ID.D.1).

Computational Thinker

Students who demonstrate understanding can:

Indicator	Standard
9-12.CT.A.1	Define complex issues, create a plan, and select appropriate technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.
9-12.CT.B.1	Evaluate created or given data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
9-12.CT.B.2	Evaluate and justify the formats for reporting results to a variety of audiences.
9-12.CT.C.1	Collaborate to break problems into component parts, identify key pieces, and use that information to problem-solve.
9-12.CT.C.2	Use 3D design tools to create prototypes, models, and simulations to demonstrate solutions and ideas.
9-12.CT.D.1	Collaborate to develop an automated process by using algorithmic thinking to develop a sequence of steps to create and test automated solutions.

ISTE Focus Area	National Indicator Connection
Focus 5. Computational Thinker (CT) *Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.*	**Computational Thinker (CT)** ● A: *Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions* (9-12.CT.A.1). ● B: *Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making* (9-12.CT.B.1 and 9-12.CT.B.2). ● C: *Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving* (9-12.CT.C.1 and 9-12.CT.C.2). ● D: *Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions* (9-12.CT.D.1).

Creative Communicator

Students who demonstrate understanding can:

Indicator	Standard
9-12.CC.A.1	Use digital learning tools and resources to identify communication needs considering goals, audience, content, access to tools or devices, and timing of communication, to involve teams in diverse locales for effective communication.
9-12.CC.B.1	Create an original work using multiple digital tools, including planning, research, editing, and production.
9-12.CC.C.1	Create digital graphic visualizations, data driven models, and simulations to succinctly communicate complex ideas and problems; justify methods and tools used.
9-12.CC.D.1	Publish or present content designed for specific audiences using online meeting tools to asynchronous and synchronous audiences.

ISTE Focus Area	National Indicator Connection
Focus 6. Creative Communicator (CC) *Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.*	**Creative Communicator (CC)** ● A: *Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication* (9-12.CC.A.1). ● B: *Create original works or responsibly repurpose or remix digital resources into new creations* (9-12.CC.B.1). ● C: *Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations* (9-12.CC.C.1). ● D: *Publish or present content that customizes the message and medium for their intended audiences* (9-12.CC.D.1).

Global Collaborator

Students who demonstrate understanding can:

Indicator	Standard
9-12.GC.A.1	Use digital tools to interact with others to develop a richer understanding of different perspectives and cultures; publish electronic artifacts that communicate to a culturally diverse and global community.
9-12.GC.B.1	Use collaborative technologies (live and recorded) to connect with global stakeholders including peers, not excluding other languages, experts, and community members, to learn about issues and problems or to gain a broader perspective; develop multiple viewpoints that may be electronically published and accessible to all audiences.
9-12.GC.C.1	Learn project management roles on a team to meet goals, based on their knowledge of technology and content, as well as personal preference; goals in project, timelines and milestones, will be monitored with tools and shared globally.
9-12.GC.D.1	Select and justify the effective collaborative technologies (live video conference, online forums, social media and other emerging communication methods) to investigate, develop, and publish solutions related to local and global issues.
9-12.GC.D.2	Understand that digital tools such as blogs and social media can be used to crowd source, crowd fund, and mobilize a community toward a goal.

ISTE Focus Area	National Indicator Connection
Focus 7. Global Collaborator (GC) *Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.*	**Global Collaborator (GC)** ● A: *Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning* (9-12.GC.A.1). ● B: *Use collaborative technologies to work with others, including peers, experts, or community members, to examine issues and problems from multiple viewpoints* (9-12.GC.B.1). ● C: *Contribute constructively to project teams, assuming various roles and responsibilities, to work effectively toward a common goal* (9-12.GC.C.1). ● D: *Explore local and global issues and use collaborative technologies to work with others to investigate solutions* (9-12.GC.D.1 and 9-12.GC.D.2).

Glossary (a-c)

This glossary includes terms used within both sets of standards and are provided to help individuals understand the content. These definitions may or may not be given to the students as written.

abstraction—[1] (process) the process of reducing complexity by focusing on the main idea; hiding details irrelevant to the question at hand and bringing together related and useful details; reduces complexity and allows one to focus on the problem; [2] (product) a new representation of a thing, a system, or a problem that helpfully reframes a problem by hiding details irrelevant to the question at hand

accessibility—the design of products, devices, services, or environments for people who experience disabilities and generally accepted by professional groups, such as the Web Content Accessibility Guidelines (WCAG) 2.0 and Accessible Rich Internet Applications (ARIA) standards

algorithm—a step-by-step process to complete a task

analog—the defining characteristic of data that is represented in a continuous, physical way; whereas digital data is a set of individual symbols, analog data is stored in physical media, such as the surface grooves on a vinyl record, the magnetic tape of a VCR cassette, or other non-digital media

app—a type of application software designed to run on a mobile device, such as a smartphone or tablet computer; also known as a mobile application

artifact—anything created by a human (see computational artifact)

audience—expected end users of a computational artifact or system

authentication—the verification of the identity of a person or process

automate—to link disparate systems and software so that they become self-regulating

automation—the process of automating

Boolean—a type of data or expression with two possible values: true and false

bug—an error in a software program that may cause a program to unexpectedly quit or behave in an unintended manner

code—any set of instructions expressed in a programming language

comment—a programmer-readable annotation in the code of a computer program added to make the code easier to understand and generally ignored by machines

complexity—the minimum amount of resources, such as memory, time, or messages, needed to solve a problem or execute an algorithm

component—an element of a larger group; usually provides a particular service or group of related services

computational—relating to computers or computing methods

computational artifact—anything created by a human using a computational thinking process and a computing device including but not limited to, a program, image, audio, video, presentation, or web page file

computational thinking—the human ability to formulate problems so that their solutions can be represented as computational steps or algorithms to be executed by a computer

Glossary

computer—a machine or device that performs processes, calculations, and operations based on instructions provided by a software or hardware program

computer science—the study of computers and algorithmic processes, including their principles, their hardware and software designs, their implementation, and their impact on society

computing—any goal-oriented activity requiring, benefiting from, or creating algorithmic processes

computing device—a physical device that uses hardware and software to receive, process, and output information, such as computers, mobile phones, and computer chips inside appliances

computing system—a collection of one or more computers or computing devices, together with their hardware and software, integrated for the purpose of accomplishing shared tasks (although a computing system can be limited to a single computer or computing device, it more commonly refers to a collection of multiple connected computers, computing devices, and hardware)

conditional—a feature of a programming language that performs different computations or actions depending on whether a programmer-specified Boolean condition evaluates to true or false and could refer to a conditional statement, conditional expression, or conditional construct

configuration—[1] (process) defining the options that are provided when installing or modifying hardware and software or the process of creating the configuration; [2] (product) the specific hardware and software details that tell exactly what the system is made up of, especially in terms of devices attached, capacity, or capability

connection—a physical or wireless attachment between multiple computing systems, computers, or computing devices

connectivity—a program's or device's ability to link with other programs and devices

control—the general power to direct the course of actions; in programming, the use of elements of programming code to direct which actions take place and the order in which they take place

control structure—a programming (code) structure that implements control, such as conditionals and loops

crowdsourcing—gathering services, ideas, or content from a large group of people, especially from the online community at the local level (e.g. classroom or school) or global level (e.g. age-appropriate online communities, like Scratch and Minecraft)

culture—a human institution manifested in the learned behavior of people, including their specific belief systems, language(s), social relations, technologies, institutions, organizations, and systems for using and developing resources

cultural practices—the displays and behaviors of a culture

cybersecurity—the protection against access to, or alteration of, computing resources through the use of technology, processes, and training

Glossary (d-p)

data—information that is collected and used for reference or analysis; digital or nondigital information, including numbers, text, show of hands, images, sounds, or video

data structure—a particular way to store and organize data within a computer program to suit a specific purpose so that it can be accessed and worked with in appropriate ways

data type—a classification of data that is distinguished by its attributes and the types of operations that can be performed on it, such as integer, string, Boolean (true or false), and floating-point

debugging—the process of finding and correcting errors (bugs) in programs

decompose—to break down into components

decomposition—breaking down a problem or system into components

device—A unit of physical hardware that provides one or more computing functions within a computing system that can provide input to the computer, accept output, or both

digital—a characteristic of electronic technology that uses discrete values, generally 0 and 1, to generate, store, and process data

digital citizenship—the norms of appropriate, responsible behavior with regard to the use of technology

efficiency—a measure of the amount of resources an algorithm uses to find an answer, usually expressed in terms of the theoretical computations, the memory used, the number of messages passed, the number of disk accesses, etc.

encapsulation—the technique of combining data and the procedures that act on it to create a type

encryption—the conversion of electronic data into another form, called ciphertext, which cannot be easily understood by anyone except authorized parties

end user—a person for whom a hardware or software product is designed (as distinguished from the developers)

event—any identifiable occurrence that has significance for system hardware or software; user-generated events include keystrokes and mouse clicks; system-generated events include program loading and errors

event handler—a procedure that specifies what should happen when a specific event occurs

execute—to carry out (or “run”) an instruction or set of instructions (e.g., program, app)

execution—the process of executing an instruction or set of instructions

hardware—the physical components that make up a computing system, computer, or computing device

hierarchy—an organizational structure in which items are ranked according to levels of importance

human-computer interaction (HCI)—the study of how people interact with computers and to what extent computing systems are or are not developed for successful interaction with human beings

Glossary

identifier—the user-defined, unique name of a program element (such as a variable or procedure) in code; an identifier name should indicate the meaning and usage of the element being named

implementation—the process of expressing the design of a solution in a programming language (code) that can be made to run on a computing device

inference—a conclusion reached on the basis of evidence and reasoning

input—the signals or instructions sent to a computer

integrity—the overall completeness, accuracy, and consistency of data

internet—the global collection of computer networks and their connections, all using shared protocols to communicate

iterative—involving the repeating of a process with the aim of approaching a desired goal, target, or result

linked list—a list in which each item contains both data and a pointer to one or both neighboring items, thus eliminating the need for the data items to be ordered in memory

loop—a programming structure that repeats a sequence of instructions as long as a specific condition is true

memory—temporary storage used by computing devices

model—a representation of some part of a problem or a system (this definition differs from that used in science)

modularity—the characteristic of a software/web application that has been divided (decomposed) into smaller modules that might have several procedures that are called from inside its main procedure and existing procedures could be reused by recombining them in a new application

module—a software component or part of a program that contains one or more procedures; one or more independently developed modules make up a program

network—a group of computing devices (personal computers, phones, servers, switches, routers, etc.) connected by cables or wireless media for the exchange of information and resources

operation—an action, resulting from a single instruction, that changes the state of data

output—a place where power or information leaves a system

packet—the unit of data sent over a network

parameter—a special kind of variable used in a procedure to refer to one of the pieces of data received as input by the procedure

phenomenon—(*pl* phenomena*)* a fact, occurrence, or circumstance observed or observable

piracy—the illegal copying, distribution, or use of software

procedure—an independent code module that fulfills some concrete task and is referenced within a larger body of program code; the fundamental role of offering a single point of reference for some small goal or task that the developer or programmer can trigger by invoking the procedure itself (in these standards, procedure is used as a general term that may refer to an actual procedure or a method, function, or module of any other name by which modules are known in other programming languages)

process—a series of actions or steps taken to achieve a particular outcome

Glossary (p-v)

program—(n) a set of instructions that the computer executes to achieve a particular objective; (v) to produce a program by programming

programming—the craft of analyzing problems and designing, writing, testing, and maintaining programs to solve them

protocol—the special set of rules used by endpoints in a telecommunication connection when they communicate, specifying interactions between the communicating entities

prototype—an early approximation of a final product or information system, often built for demonstration purposes

pseudocode—computing instructions written in symbolic code which must be translated into a program language before they can be executed

redundancy—a system design in which a component is duplicated, so if it fails, there will be a backup

reliability—An attribute of any system that consistently produces the same results, preferably meeting or exceeding its requirements

remix—the process of creating something new from something old, originally a process that involved music; creating a new version of a program by recombining and modifying parts of existing programs, and often adding new pieces, to form new solutions

router—a device or software that determines the path that data packets travel from source to destination

scalability—the capability of a network to handle a growing amount of work or its potential to be enlarged to accommodate that growth

security—see cybersecurity

simulate—to imitate the operation of a real-world process or system

simulation—imitation of the operation of a real-world process or system

software—programs that run on a computing system, computer, or other computing device

storage—a mechanism that enables a computer to retain data, either temporarily or permanently; a place, usually a device, into which data can be entered, in which the data can be held, and from which the data can be retrieved at a later time; a process through which digital data is saved within a data storage device by means of computing technology

string—a sequence of letters, numbers, and/or other symbols. A string might represent, for example, a name, address, or song title (functions commonly associated with strings are length, concatenation, and substring)

structure—a general term used to discuss the concept of encapsulation without specifying a particular programing methodology

switch—a high-speed device that receives incoming data packets and redirects them to their destination on a local area network (LAN)

system—a collection of elements or components that work together for a common purpose (see computing system)

test case—a set of conditions or variables under which a tester will determine whether the system being tested satisfies requirements or works correctly

Glossary

topology—the physical and logical configuration of a network; the arrangement of a network, including its nodes and connecting links; logical topology is the way devices appear connected to the user; physical topology is the way they are actually interconnected with wires and cables

troubleshooting—a systematic approach to problem solving that is often used to find and resolve a problem, error, or fault within software or a computing system

user—see end user

variable—a symbolic name that is used to keep track of a value that can change while a program is running, including numbers, text, whole sentences (strings), or logical values (true or false); a data type associated with a data storage location; a value is normally changed during the course of program execution (this definition differs from that used in math)

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