Main Criteria: Forward Education

Secondary Criteria: Nebraska Content Area Standards, Nevada Academic Content Standards, New Hampshire College and Career Ready Standards, New Jersey Student Learning Standards, New Mexico Content Standards, New York State Learning Standards and Core Curriculum, North Carolina Standard Course of Study, North Dakota Content Standards, Northern Territory Curriculum, Ohio Learning Standards, Oklahoma Academic Standards, Oregon Academic Content Standards

Subjects: Mathematics, Science, Technology Education

Grades: 7, 8

Forward Education

Harnessing the Sun's Energy with Solar Panels

Nebraska Content Area Standards

Mathematics

Grade **7** - Adopted: **2022**

CONTENT STANDARD		Grade 7 Standards
STRAND	7.N.	NUMBER: Students will solve problems and reason with number concepts using multiple representations, make connections within math and across disciplines, and communicate their ideas.
INDICATOR	7.N.2.	Operations: Students will compute with rational numbers accurately.
STRAND	7.N.2.b.	Apply properties of operations (commutative, associative, distributive, identity, inverse, zero) as strategies for problem solving with rational numbers.

CONTENT STANDARD		Grade 7 Standards
STRAND	7.A.	ALGEBRA: Students will solve problems and reason with algebra using multiple representations, make connections within math and across disciplines, and communicate their ideas.
INDICATOR	7.A.1.	Algebraic Processes: Students will apply the operational properties when evaluating expressions, and solving equations and inequalities.
STRAND	7.A.1.a.	Use factoring and properties of operations to create equivalent algebraic expressions (e.g., 2x + 6 = 2(x + 3)).

Nebraska Content Area Standards

Science

Grade **7** - Adopted: **2017**

CONTENT STANDARD	NE.SC.7.7.	Interdependent Relationships in Ecosystems
STRAND	SC.7.7.3.	Gather, analyze, and communicate evidence of interdependent relationships in ecosystems.
INDICATOR	SC.7.7.3.D.	Apply scientific principles to design a method for monitoring and increasing positive human impact on the environment.

CONTENT STANDARD	NE.SC.7.13.	Earth's Systems
STRAND	SC.7.13.5.	Gather, analyze, and communicate evidence of the flow of energy and cycling of matter associated with Earth's materials and processes.
INDICATOR	SC.7.13.5.B.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
INDICATOR	SC.7.13.5.C.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Nebraska Content Area Standards

Science

Grade **8** - Adopted: **2017**

CONTENT STANDARD	**NE.SC.8.1.**	**Forces and Interactions**
STRAND	**SC.8.1.1.**	**Gather, analyze, and communicate evidence of forces and interactions.**
INDICATOR	SC.8.1.1.B.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Nebraska Content Area Standards

Technology Education

Grade **7** - Adopted: **2018**

CONTENT STANDARD		**NEBRASKA K-12 TECHNOLOGY Scope & Sequence**
STRAND		**BASIC TECHNOLOGY - Operations/Concepts**
INDICATOR		**HARDWARE/SOFTWARE STANDARDS**
STRAND		Apply strategies for identifying and solving routine problems that occur during everyday computer use.

CONTENT STANDARD		**NEBRASKA K-12 TECHNOLOGY Scope & Sequence**
STRAND		**DIGITAL MEDIA**
INDICATOR		**DIGITAL MEDIA STANDARDS**
STRAND		Independently use appropriate technology tools (graphic organizers, audio and video) to define problems and propose hypotheses.

CONTENT STANDARD		**NEBRASKA K-12 TECHNOLOGY Scope & Sequence**
STRAND		**COMPUTER SCIENCE/PROGRAMMING**
INDICATOR		**COMPUTATIONAL THINKING STANDARDS**
STRAND		Create algorithms, or series of ordered steps, to solve problems.
STRAND		Decompose a problem into smaller more manageable parts.
STRAND		Optimize an algorithm for execution by a computer.
STRAND		Create simulations/models to understand natural phenomena and test hypotheses.

CONTENT STANDARD		**NEBRASKA K-12 TECHNOLOGY Scope & Sequence**
STRAND		**COMPUTER SCIENCE/PROGRAMMING**
INDICATOR		**PROGRAMMING STANDARDS**
STRAND		Write programs using visual (block-based) programming languages (scratch, code.org).

Nebraska Content Area Standards

Technology Education

Grade **8** - Adopted: **2018**

CONTENT STANDARD		NEBRASKA K-12 TECHNOLOGY Scope & Sequence
STRAND		BASIC TECHNOLOGY - Operations/Concepts
INDICATOR		HARDWARE/SOFTWARE STANDARDS
STRAND		Apply strategies for identifying and solving routine problems that occur during everyday computer use.

CONTENT STANDARD		NEBRASKA K-12 TECHNOLOGY Scope & Sequence
STRAND		DIGITAL MEDIA
INDICATOR		DIGITAL MEDIA STANDARDS
STRAND		Independently use appropriate technology tools (graphic organizers, audio and video) to define problems and propose hypotheses.

CONTENT STANDARD		NEBRASKA K-12 TECHNOLOGY Scope & Sequence
STRAND		COMPUTER SCIENCE/PROGRAMMING
INDICATOR		COMPUTATIONAL THINKING STANDARDS
STRAND		Create algorithms, or series of ordered steps, to solve problems.
STRAND		Decompose a problem into smaller more manageable parts.
STRAND		Optimize an algorithm for execution by a computer.
STRAND		Create simulations/models to understand natural phenomena and test hypotheses.
STRAND		Evaluate algorithms by their efficiency, correctness, and clarity.

CONTENT STANDARD		NEBRASKA K-12 TECHNOLOGY Scope & Sequence
STRAND		COMPUTER SCIENCE/PROGRAMMING
INDICATOR		PROGRAMMING STANDARDS
STRAND		Write programs using visual (block-based) programming languages (scratch, code.org).

Nevada Academic Content Standards

Mathematics

Grade **7** - Adopted: **2010**

CONTENT STANDARD	NV.CC.MP.7.	Mathematical Practices
STRAND / INDICATOR	MP.7.1.	Make sense of problems and persevere in solving them.
STRAND / INDICATOR	MP.7.2.	Reason abstractly and quantitatively.

STRAND / INDICATOR	MP.7.3.	Construct viable arguments and critique the reasoning of others.
STRAND / INDICATOR	MP.7.4.	Model with mathematics.
STRAND / INDICATOR	MP.7.6.	Attend to precision.
STRAND / INDICATOR	MP.7.7.	Look for and make use of structure.

Nevada Academic Content Standards
Mathematics
Grade **8** - Adopted: **2010**

CONTENT STANDARD	NV.CC.MP.8.	Mathematical Practices
STRAND / INDICATOR	MP.8.1.	Make sense of problems and persevere in solving them.
STRAND / INDICATOR	MP.8.2.	Reason abstractly and quantitatively.
STRAND / INDICATOR	MP.8.3.	Construct viable arguments and critique the reasoning of others.
STRAND / INDICATOR	MP.8.4.	Model with mathematics.
STRAND / INDICATOR	MP.8.6.	Attend to precision.
STRAND / INDICATOR	MP.8.7.	Look for and make use of structure.

Nevada Academic Content Standards
Science
Grade **7** - Adopted: **2014**

CONTENT STANDARD	NV.MS-ESS.	EARTH AND SPACE SCIENCE
STRAND / INDICATOR	**MS-ESS3.**	**Earth and Human Activity**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
GRADE LEVEL EXPECTATION	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

GRADE LEVEL EXPECTATION	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
GRADE LEVEL EXPECTATION	MS-ESS3-5.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.
CONTENT STANDARD	**NV.MS-ETS.**	**ENGINEERING DESIGN**
STRAND / INDICATOR	**MS-ETS1.**	**Engineering Design**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
GRADE LEVEL EXPECTATION	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
GRADE LEVEL EXPECTATION	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **7** - Adopted: **2010**

CONTENT STANDARD	**NV.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Key Ideas and Details**
INDICATOR / GRADE LEVEL EXPECTATION	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
INDICATOR / GRADE LEVEL EXPECTATION	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
CONTENT STANDARD	**NV.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Craft and Structure**
INDICATOR / GRADE LEVEL EXPECTATION	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
INDICATOR / GRADE LEVEL EXPECTATION	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
CONTENT STANDARD	**NV.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Integration of Knowledge and Ideas**

INDICATOR / GRADE LEVEL EXPECTATION	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CONTENT STANDARD	**NV.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Range of Reading and Level of Text Complexity**
INDICATOR / GRADE LEVEL EXPECTATION	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

CONTENT STANDARD	**NV.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Text Types and Purposes**
INDICATOR / GRADE LEVEL EXPECTATION	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
GRADE LEVEL EXPECTATION	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.

CONTENT STANDARD	**NV.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Production and Distribution of Writing**
INDICATOR / GRADE LEVEL EXPECTATION	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
INDICATOR / GRADE LEVEL EXPECTATION	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Nevada Academic Content Standards

Science

Grade **8** - Adopted: **2014**

CONTENT STANDARD	**NV.MS-ESS.**	**EARTH AND SPACE SCIENCE**
STRAND / INDICATOR	**MS-ESS3.**	**Earth and Human Activity**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
GRADE LEVEL EXPECTATION	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

GRADE LEVEL EXPECTATION	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
GRADE LEVEL EXPECTATION	MS-ESS3-5.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.
CONTENT STANDARD	**NV.MS-ETS.**	**ENGINEERING DESIGN**
STRAND / INDICATOR	**MS-ETS1.**	**Engineering Design**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
GRADE LEVEL EXPECTATION	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
GRADE LEVEL EXPECTATION	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **8** - Adopted: **2010**

CONTENT STANDARD	**NV.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Key Ideas and Details**
INDICATOR / GRADE LEVEL EXPECTATION	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
INDICATOR / GRADE LEVEL EXPECTATION	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
CONTENT STANDARD	**NV.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Craft and Structure**
INDICATOR / GRADE LEVEL EXPECTATION	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
INDICATOR / GRADE LEVEL EXPECTATION	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
CONTENT STANDARD	**NV.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Integration of Knowledge and Ideas**

INDICATOR / GRADE LEVEL EXPECTATION	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CONTENT STANDARD	**NV.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Range of Reading and Level of Text Complexity**
INDICATOR / GRADE LEVEL EXPECTATION	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

CONTENT STANDARD	**NV.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Text Types and Purposes**
INDICATOR / GRADE LEVEL EXPECTATION	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
GRADE LEVEL EXPECTATION	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.

CONTENT STANDARD	**NV.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Production and Distribution of Writing**
INDICATOR / GRADE LEVEL EXPECTATION	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
INDICATOR / GRADE LEVEL EXPECTATION	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Nevada Academic Content Standards

Technology Education

Grade **7** - Adopted: **2019**

CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE**
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P1.**	**Fostering an Inclusive Computing Culture**
GRADE LEVEL EXPECTATION	P1.2.	Address the needs of diverse end users during the design process to produce artifacts with broad accessibility and usability.
GRADE LEVEL EXPECTATION	P1.3.	Employ self- and peer-advocacy to address bias in interactions, product design, and development methods.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P3.**	**Recognizing and Defining Computational Problems**
GRADE LEVEL EXPECTATION	P3.1.	Identify complex, interdisciplinary, real-world problems that can be solved computationally.
GRADE LEVEL EXPECTATION	P3.2.	Decompose complex real-world problems into manageable subproblems that could integrate existing solutions or procedures.
GRADE LEVEL EXPECTATION	P3.3.	Evaluate whether it is appropriate and feasible to solve a problem computationally.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P4.**	**Developing and Using Abstractions**
GRADE LEVEL EXPECTATION	P4.3.	Create modules and develop points of interaction that can apply to multiple situations and reduce complexity.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P5.**	**Creating Computational Artifacts**
GRADE LEVEL EXPECTATION	P5.1.	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.
GRADE LEVEL EXPECTATION	P5.2.	Create a computational artifact for practical intent, personal expression, or to address a societal issue.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P6.**	**Testing and Refining Computational Artifacts**
GRADE LEVEL EXPECTATION	P6.1.	Systematically test computational artifacts by considering all scenarios and using test cases.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE

STRAND / INDICATOR		Practices
INDICATOR / GRADE LEVEL EXPECTATION	**P7.**	**Communicating About Computing**
GRADE LEVEL EXPECTATION	P7.1.	Select, organize, and interpret large data sets from multiple sources to support a claim.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY
STRAND / INDICATOR		Innovative Designer
INDICATOR / GRADE LEVEL EXPECTATION	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.
INDICATOR / GRADE LEVEL EXPECTATION	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.
INDICATOR / GRADE LEVEL EXPECTATION	6-8.ID.D.1.	Demonstrate an ability to persevere and handle greater ambiguity as they work to solve open-ended problems.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY
STRAND / INDICATOR		Computational Thinker
INDICATOR / GRADE LEVEL EXPECTATION	6-8.CT.B.1.	Find or organize data and use technology to analyze and represent the data to solve problems and make decisions.
INDICATOR / GRADE LEVEL EXPECTATION	6-8.CT.C.1.	Break problems into component parts, identify key pieces, and use that information to problem solve.

Nevada Academic Content Standards
Technology Education
Grade **8** - Adopted: **2019**

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE
STRAND / INDICATOR		Practices
INDICATOR / GRADE LEVEL EXPECTATION	**P1.**	**Fostering an Inclusive Computing Culture**
GRADE LEVEL EXPECTATION	P1.2.	Address the needs of diverse end users during the design process to produce artifacts with broad accessibility and usability.
GRADE LEVEL EXPECTATION	P1.3.	Employ self- and peer-advocacy to address bias in interactions, product design, and development methods.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P3.**	**Recognizing and Defining Computational Problems**
GRADE LEVEL EXPECTATION	P3.1.	Identify complex, interdisciplinary, real-world problems that can be solved computationally.
GRADE LEVEL EXPECTATION	P3.2.	Decompose complex real-world problems into manageable subproblems that could integrate existing solutions or procedures.
GRADE LEVEL EXPECTATION	P3.3.	Evaluate whether it is appropriate and feasible to solve a problem computationally.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P4.**	**Developing and Using Abstractions**
GRADE LEVEL EXPECTATION	P4.3.	Create modules and develop points of interaction that can apply to multiple situations and reduce complexity.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P5.**	**Creating Computational Artifacts**
GRADE LEVEL EXPECTATION	P5.1.	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.
GRADE LEVEL EXPECTATION	P5.2.	Create a computational artifact for practical intent, personal expression, or to address a societal issue.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P6.**	**Testing and Refining Computational Artifacts**
GRADE LEVEL EXPECTATION	P6.1.	Systematically test computational artifacts by considering all scenarios and using test cases.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE
STRAND / INDICATOR		Practices
INDICATOR / GRADE LEVEL EXPECTATION	P7.	Communicating About Computing
GRADE LEVEL EXPECTATION	P7.1.	Select, organize, and interpret large data sets from multiple sources to support a claim.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY
STRAND / INDICATOR		Innovative Designer
INDICATOR / GRADE LEVEL EXPECTATION	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.
INDICATOR / GRADE LEVEL EXPECTATION	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.
INDICATOR / GRADE LEVEL EXPECTATION	6-8.ID.D.1.	Demonstrate an ability to persevere and handle greater ambiguity as they work to solve open-ended problems.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY
STRAND / INDICATOR		Computational Thinker
INDICATOR / GRADE LEVEL EXPECTATION	6-8.CT.B.1.	Find or organize data and use technology to analyze and represent the data to solve problems and make decisions.
INDICATOR / GRADE LEVEL EXPECTATION	6-8.CT.C.1.	Break problems into component parts, identify key pieces, and use that information to problem solve.

New Hampshire College and Career Ready Standards

Mathematics

Grade **7** - Adopted: **2010**

STRAND / STANDARD	NH.CC.MP.7.	Mathematical Practices
STANDARD / GLE	MP.7.1.	Make sense of problems and persevere in solving them.
STANDARD / GLE	MP.7.2.	Reason abstractly and quantitatively.
STANDARD / GLE	MP.7.3.	Construct viable arguments and critique the reasoning of others.

STANDARD / GLE	MP.7.4.	Model with mathematics.
STANDARD / GLE	MP.7.6.	Attend to precision.
STANDARD / GLE	MP.7.7.	Look for and make use of structure.

New Hampshire College and Career Ready Standards
Mathematics
Grade **8** - Adopted: **2010**

STRAND / STANDARD	**NH.CC.MP.8.**	**Mathematical Practices**
STANDARD / GLE	MP.8.1.	Make sense of problems and persevere in solving them.
STANDARD / GLE	MP.8.2.	Reason abstractly and quantitatively.
STANDARD / GLE	MP.8.3.	Construct viable arguments and critique the reasoning of others.
STANDARD / GLE	MP.8.4.	Model with mathematics.
STANDARD / GLE	MP.8.6.	Attend to precision.
STANDARD / GLE	MP.8.7.	Look for and make use of structure.

New Hampshire College and Career Ready Standards
Science
Grade **7** - Adopted: **2016**

STRAND / STANDARD	**NGSS.MS-ESS.**	**EARTH AND SPACE SCIENCE**
STANDARD / GLE	**MS-ESS3.**	**Earth and Human Activity**
GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
EXPECTATION	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes.
EXPECTATION	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
EXPECTATION	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth’s systems.

EXPECTATION	MS-ESS3-5.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

STRAND / STANDARD	NGSS.MS-ETS.	ENGINEERING DESIGN
STANDARD / GLE	MS-ETS1.	Engineering Design
GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:
EXPECTATION	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
EXPECTATION	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
EXPECTATION	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

STRAND / STANDARD	NGSS.MS-ESS.	EARTH AND SPACE SCIENCE
STANDARD / GLE	MS-ESS3.	Earth and Human Activity
GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:
EXPECTATION	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
EXPECTATION	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
EXPECTATION	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
EXPECTATION	MS-ESS3-5.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

STRAND / STANDARD	NGSS.MS-ETS.	ENGINEERING DESIGN
STANDARD / GLE	MS-ETS1.	Engineering Design
GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:
EXPECTATION	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

EXPECTATION	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
EXPECTATION	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

New Hampshire College and Career Ready Standards
Technology Education
Grade **7** - Adopted: **2005**

STRAND / STANDARD	**NH.ICT.**	**Information and Communication Technologies Program**
STANDARD / GLE	**ICT.2.**	**USE WITH CORE SUBJECTS: Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and create information within the context of the core subjects of:**
GRADE LEVEL EXPECTATION	ICT.2.d.	Science

STRAND / STANDARD	**NH.ICT.**	**Information and Communication Technologies Program**
STANDARD / GLE	**ICT.3.**	**COGNITIVE PROFICIENCY: Use 21st century tools to develop cognitive proficiency in:**
GRADE LEVEL EXPECTATION	ICT.3.c.	Problem solving

STRAND / STANDARD	**NH.ICT.**	**Information and Communication Technologies Program**
STANDARD / GLE	**ICT.5.**	**DIGITAL PORTFOLIOS: Create digital portfolios which:**
GRADE LEVEL EXPECTATION	ICT.5.b.	Represent proficient, ethical, responsible use of 21st century tools within the context of the core subjects

Grade **7** - Adopted: **2018**

STRAND / STANDARD		**Computer Science**
STANDARD / GLE		**Algorithms & Programming**
GRADE LEVEL EXPECTATION	2-AP-10.	Use flowcharts and/or pseudocode to address complex problems as algorithms.

New Hampshire College and Career Ready Standards
Technology Education
Grade **8** - Adopted: **2005**

STRAND / STANDARD	**NH.ICT.**	**Information and Communication Technologies Program**
STANDARD / GLE	**ICT.2.**	**USE WITH CORE SUBJECTS: Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and create information within the context of the core subjects of:**
GRADE LEVEL EXPECTATION	ICT.2.d.	Science

STRAND / STANDARD	**NH.ICT.**	**Information and Communication Technologies Program**
STANDARD / GLE	**ICT.3.**	**COGNITIVE PROFICIENCY: Use 21st century tools to develop cognitive proficiency in:**
GRADE LEVEL EXPECTATION	ICT.3.c.	Problem solving

STRAND / STANDARD	**NH.ICT.**	**Information and Communication Technologies Program**
STANDARD / GLE	**ICT.5.**	**DIGITAL PORTFOLIOS: Create digital portfolios which:**
GRADE LEVEL EXPECTATION	ICT.5.b.	Represent proficient, ethical, responsible use of 21st century tools within the context of the core subjects

Grade **8** - Adopted: **2018**

STRAND / STANDARD		**Computer Science**
STANDARD / GLE		**Algorithms & Programming**
GRADE LEVEL EXPECTATION	2-AP-10.	Use flowcharts and/or pseudocode to address complex problems as algorithms.

New Jersey Student Learning Standards

Mathematics

Grade **7** - Adopted: **2016**

CONTENT AREA / STANDARD	**NJ.MP.**	**Mathematical Practices**
STRAND	MP.1.	Make sense of problems and persevere in solving them.
STRAND	MP.2.	Reason abstractly and quantitatively.
STRAND	MP.3.	Construct viable arguments and critique the reasoning of others.
STRAND	MP.4.	Model with mathematics.
STRAND	MP.6.	Attend to precision.
STRAND	MP.7.	Look for and make use of structure.

New Jersey Student Learning Standards

Mathematics

Grade **8** - Adopted: **2016**

CONTENT AREA / STANDARD	**NJ.MP.**	**Mathematical Practices**
STRAND	MP.1.	Make sense of problems and persevere in solving them.

STRAND	MP.2.	Reason abstractly and quantitatively.
STRAND	MP.3.	Construct viable arguments and critique the reasoning of others.
STRAND	MP.4.	Model with mathematics.
STRAND	MP.6.	Attend to precision.
STRAND	MP.7.	Look for and make use of structure.

New Jersey Student Learning Standards

Science

Grade **7** - Adopted: **2020/Effective 2021**

CONTENT AREA / STANDARD	**MS-ESS.**	**Earth and Space Science**
STRAND	**MS-ESS3:**	**Earth and Human Activity**
CONTENT STATEMENT	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
CONTENT STATEMENT	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
CONTENT STATEMENT	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
CONTENT STATEMENT	MS-ESS3-5.	Ask questions to clarify evidence of the factors that have caused climate change over the past century.

CONTENT AREA / STANDARD	**MS-ETS.**	**Engineering, Technology and Applications of Science**
STRAND	**MS5-ETS1:**	**Engineering Design**
CONTENT STATEMENT	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
CONTENT STATEMENT	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
CONTENT STATEMENT	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

New Jersey Student Learning Standards

Science

Grade **8** - Adopted: **2020/Effective 2021**

CONTENT AREA / STANDARD	**MS-ESS.**	**Earth and Space Science**

STRAND	**MS-ESS3:**	**Earth and Human Activity**
CONTENT STATEMENT	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
CONTENT STATEMENT	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
CONTENT STATEMENT	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
CONTENT STATEMENT	MS-ESS3-5.	Ask questions to clarify evidence of the factors that have caused climate change over the past century.
CONTENT AREA / STANDARD	**MS-ETS.**	**Engineering, Technology and Applications of Science**
STRAND	**MS5-ETS1:**	**Engineering Design**
CONTENT STATEMENT	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
CONTENT STATEMENT	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
CONTENT STATEMENT	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

New Jersey Student Learning Standards

Technology Education

Grade **7** - Adopted: **2020**

CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**1 Fostering an Inclusive Computing and Design Culture**
CONTENT STATEMENT		**Building an inclusive and diverse computing culture requires strategies for incorporating perspectives from people of different genders, ethnicities, and abilities. Incorporating these perspectives involves understanding the personal, ethical, social, economic, and cultural contexts in which people operate. Considering the needs of diverse users during the design process is essential to producing inclusive computational products. When engaging in this practice, students:**
CUMULATIVE PROGRESS INDICATOR		Employ self- and peer-advocacy to address bias in interactions, product design, and development methods.
CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**3 Recognizing and Defining Computational Problems**
CONTENT STATEMENT		**The ability to recognize appropriate and worthwhile opportunities to apply computation is a skill that develops over time and is central to computing. Solving a problem with a computational approach requires defining the problem, breaking it down into parts, and evaluating each part to determine whether a computational solution is appropriate. When engaging in this practice, students:**

CUMULATIVE PROGRESS INDICATOR		Decompose complex real-world problems into manageable sub-problems that could integrate existing solutions or procedures.
CUMULATIVE PROGRESS INDICATOR		Evaluate whether it is appropriate and feasible to solve a problem computationally.
CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**4 Developing and Using Abstractions**
CONTENT STATEMENT		**Abstractions are formed by identifying patterns and extracting common features from specific examples in order to create generalizations. Using generalized solutions and parts of solutions designed for broad reuse simplifies the development process by managing complexity. When engaging in this practice, students:**
CUMULATIVE PROGRESS INDICATOR		Evaluate existing technological functionalities and incorporate them into new designs.
CUMULATIVE PROGRESS INDICATOR		Create modules and develop points of interaction that can apply to multiple situations and reduce complexity.
CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**5 Creating Computational Artifacts**
CONTENT STATEMENT		**The process of developing computational artifacts embraces both creative expression and the exploration of ideas to create prototypes and solve computational problems. Students create artifacts that are personally relevant or beneficial to their community and beyond. Computational artifacts can be created by combining and modifying existing artifacts or by developing new artifacts. Examples of computational artifacts include programs, simulations, visualizations, digital animations, robotic systems, and apps. When engaging in this practice, students:**
CUMULATIVE PROGRESS INDICATOR		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.
CUMULATIVE PROGRESS INDICATOR		Create a computational artifact for practical intent, personal expression, or to address a societal issue.
CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**6 Testing and Refining Computational Artifacts**
CONTENT STATEMENT		**Testing and refinement is the deliberate and iterative process of improving a computational artifact. This process includes debugging (identifying and fixing errors) and comparing actual outcomes to intended outcomes. Students also respond to the changing needs and expectations of end users and improve the performance, reliability, usability, and accessibility of artifacts. When engaging in this practice, students:**
CUMULATIVE PROGRESS INDICATOR		Systematically test computational artifacts by considering all scenarios and using test cases.

CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Computing Systems**
CONTENT STATEMENT		**Software and hardware determine a computing system's capability to store and process information. The design or selection of a computing system involves multiple considerations and potential trade-offs.**

CUMULATIVE PROGRESS INDICATOR	8.1.8.CS. 3:	Justify design decisions and explain potential system trade-offs.

CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Data & Analysis**
CONTENT STATEMENT		**Computer models can be used to simulate events, examine theories and inferences, or make predictions.**

CUMULATIVE PROGRESS INDICATOR	8.1.8.DA. 5:	Test, analyze, and refine computational models.

CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Algorithms & Programming**
CONTENT STATEMENT		**Individuals design algorithms that are reusable in many situations. Algorithms that are readable are easier to follow, test, and debug.**

CUMULATIVE PROGRESS INDICATOR	8.1.8.AP. 1:	Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.

CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Algorithms & Programming**
CONTENT STATEMENT		**Individuals design and test solutions to identify problems taking into consideration the diverse needs of the users and the community.**

CUMULATIVE PROGRESS INDICATOR	8.1.8.AP. 8:	Systematically test and refine programs using a range of test cases and users.

CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Engineering Design**
CONTENT STATEMENT		**Engineering design is a systematic, creative, and iterative process used to address local and global problems. The process includes generating ideas, choosing the best solution, and making, testing, and redesigning models or prototypes.**

CUMULATIVE PROGRESS INDICATOR	8.2.8.ED.2:	Identify the steps in the design process that could be used to solve a problem.
CUMULATIVE PROGRESS INDICATOR	8.2.8.ED.4:	Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team.
CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Engineering Design**
CONTENT STATEMENT		**Engineering design requirements and specifications involve making trade-offs between competing requirements and desired design features.**
CUMULATIVE PROGRESS INDICATOR	8.2.8.ED.5:	Explain the need for optimization in a design process.
CUMULATIVE PROGRESS INDICATOR	8.2.8.ED.6:	Analyze how trade-offs can impact the design of a product.
CUMULATIVE PROGRESS INDICATOR	8.2.8.ED.7:	Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches).
CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Nature of Technology**
CONTENT STATEMENT		**Technology advances through the processes of innovation and invention which relies upon the imaginative and inventive nature of people. Sometimes a technology developed for one purpose is adapted to serve other purposes. Engineers use a systematic process of creating or modifying technologies that is fueled and constrained by physical laws, cultural norms, and economic resources. Scientists use systematic investigation to understand the natural world.**
CUMULATIVE PROGRESS INDICATOR	8.2.8.NT.1:	Examine a malfunctioning tool, product, or system and propose solutions to the problem.
CUMULATIVE PROGRESS INDICATOR	8.2.8.NT.4:	Explain how a product designed for a specific demand was modified to meet a new demand and led to a new product.
CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Effects of Technology on the Natural World**
CONTENT STATEMENT		**Resources need to be utilized wisely to have positive effects on the environment and society. Some technological decisions involve tradeoffs between environmental and economic needs, while others have positive effects for both the economy and environment.**
CUMULATIVE PROGRESS INDICATOR	8.2.8.ETW.3:	Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact.

New Jersey Student Learning Standards
Technology Education
Grade **8** - Adopted: **2020**

CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**1 Fostering an Inclusive Computing and Design Culture**
CONTENT STATEMENT		**Building an inclusive and diverse computing culture requires strategies for incorporating perspectives from people of different genders, ethnicities, and abilities. Incorporating these perspectives involves understanding the personal, ethical, social, economic, and cultural contexts in which people operate. Considering the needs of diverse users during the design process is essential to producing inclusive computational products. When engaging in this practice, students:**
CUMULATIVE PROGRESS INDICATOR		Employ self- and peer-advocacy to address bias in interactions, product design, and development methods.

CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**3 Recognizing and Defining Computational Problems**
CONTENT STATEMENT		**The ability to recognize appropriate and worthwhile opportunities to apply computation is a skill that develops over time and is central to computing. Solving a problem with a computational approach requires defining the problem, breaking it down into parts, and evaluating each part to determine whether a computational solution is appropriate. When engaging in this practice, students:**
CUMULATIVE PROGRESS INDICATOR		Decompose complex real-world problems into manageable sub-problems that could integrate existing solutions or procedures.
CUMULATIVE PROGRESS INDICATOR		Evaluate whether it is appropriate and feasible to solve a problem computationally.

CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**4 Developing and Using Abstractions**
CONTENT STATEMENT		**Abstractions are formed by identifying patterns and extracting common features from specific examples in order to create generalizations. Using generalized solutions and parts of solutions designed for broad reuse simplifies the development process by managing complexity. When engaging in this practice, students:**
CUMULATIVE PROGRESS INDICATOR		Evaluate existing technological functionalities and incorporate them into new designs.
CUMULATIVE PROGRESS INDICATOR		Create modules and develop points of interaction that can apply to multiple situations and reduce complexity.

CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**5 Creating Computational Artifacts**

CONTENT STATEMENT		**The process of developing computational artifacts embraces both creative expression and the exploration of ideas to create prototypes and solve computational problems. Students create artifacts that are personally relevant or beneficial to their community and beyond. Computational artifacts can be created by combining and modifying existing artifacts or by developing new artifacts. Examples of computational artifacts include programs, simulations, visualizations, digital animations, robotic systems, and apps. When engaging in this practice, students:**
CUMULATIVE PROGRESS INDICATOR		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.
CUMULATIVE PROGRESS INDICATOR		Create a computational artifact for practical intent, personal expression, or to address a societal issue.
CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**6 Testing and Refining Computational Artifacts**
CONTENT STATEMENT		**Testing and refinement is the deliberate and iterative process of improving a computational artifact. This process includes debugging (identifying and fixing errors) and comparing actual outcomes to intended outcomes. Students also respond to the changing needs and expectations of end users and improve the performance, reliability, usability, and accessibility of artifacts. When engaging in this practice, students:**
CUMULATIVE PROGRESS INDICATOR		Systematically test computational artifacts by considering all scenarios and using test cases.
CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Computing Systems**
CONTENT STATEMENT		**Software and hardware determine a computing system's capability to store and process information. The design or selection of a computing system involves multiple considerations and potential trade-offs.**
CUMULATIVE PROGRESS INDICATOR	8.1.8.CS.3:	Justify design decisions and explain potential system trade-offs.
CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Data & Analysis**
CONTENT STATEMENT		**Computer models can be used to simulate events, examine theories and inferences, or make predictions.**
CUMULATIVE PROGRESS INDICATOR	8.1.8.DA.5:	Test, analyze, and refine computational models.
CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Algorithms & Programming**
CONTENT STATEMENT		**Individuals design algorithms that are reusable in many situations. Algorithms that are readable are easier to follow, test, and debug.**

CUMULATIVE PROGRESS INDICATOR	8.1.8.AP.1:	Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.
CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Algorithms & Programming**
CONTENT STATEMENT		**Individuals design and test solutions to identify problems taking into consideration the diverse needs of the users and the community.**
CUMULATIVE PROGRESS INDICATOR	8.1.8.AP.8:	Systematically test and refine programs using a range of test cases and users.
CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Engineering Design**
CONTENT STATEMENT		**Engineering design is a systematic, creative, and iterative process used to address local and global problems. The process includes generating ideas, choosing the best solution, and making, testing, and redesigning models or prototypes.**
CUMULATIVE PROGRESS INDICATOR	8.2.8.ED.2:	Identify the steps in the design process that could be used to solve a problem.
CUMULATIVE PROGRESS INDICATOR	8.2.8.ED.4:	Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team.
CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Engineering Design**
CONTENT STATEMENT		**Engineering design requirements and specifications involve making trade-offs between competing requirements and desired design features.**
CUMULATIVE PROGRESS INDICATOR	8.2.8.ED.5:	Explain the need for optimization in a design process.
CUMULATIVE PROGRESS INDICATOR	8.2.8.ED.6:	Analyze how trade-offs can impact the design of a product.
CUMULATIVE PROGRESS INDICATOR	8.2.8.ED.7:	Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches).
CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Nature of Technology**

CONTENT STATEMENT		**Technology advances through the processes of innovation and invention which relies upon the imaginative and inventive nature of people. Sometimes a technology developed for one purpose is adapted to serve other purposes. Engineers use a systematic process of creating or modifying technologies that is fueled and constrained by physical laws, cultural norms, and economic resources. Scientists use systematic investigation to understand the natural world.**
CUMULATIVE PROGRESS INDICATOR	8.2.8.NT.1:	Examine a malfunctioning tool, product, or system and propose solutions to the problem.
CUMULATIVE PROGRESS INDICATOR	8.2.8.NT.4:	Explain how a product designed for a specific demand was modified to meet a new demand and led to a new product.

CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Effects of Technology on the Natural World**
CONTENT STATEMENT		**Resources need to be utilized wisely to have positive effects on the environment and society. Some technological decisions involve tradeoffs between environmental and economic needs, while others have positive effects for both the economy and environment.**
CUMULATIVE PROGRESS INDICATOR	8.2.8.ETW.3:	Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact.

New Mexico Content Standards

Mathematics

Grade **7** - Adopted: **2012**

STRAND / CONTENT STANDARD	**NM.MP.**	**Mathematical Practices**
BENCHMARK / STANDARD	MP.1.	Make sense of problems and persevere in solving them.
BENCHMARK / STANDARD	MP.2.	Reason abstractly and quantitatively.
BENCHMARK / STANDARD	MP.3.	Construct viable arguments and critique the reasoning of others.
BENCHMARK / STANDARD	MP.4.	Model with mathematics.
BENCHMARK / STANDARD	MP.6.	Attend to precision.
BENCHMARK / STANDARD	MP.7.	Look for and make use of structure.

New Mexico Content Standards

Mathematics

Grade **8** - Adopted: **2012**

STRAND / CONTENT STANDARD	**NM.MP.**	**Mathematical Practices**

BENCHMARK / STANDARD	MP.1.	Make sense of problems and persevere in solving them.
BENCHMARK / STANDARD	MP.2.	Reason abstractly and quantitatively.
BENCHMARK / STANDARD	MP.3.	Construct viable arguments and critique the reasoning of others.
BENCHMARK / STANDARD	MP.4.	Model with mathematics.
BENCHMARK / STANDARD	MP.6.	Attend to precision.
BENCHMARK / STANDARD	MP.7.	Look for and make use of structure.

New Mexico Content Standards

Science

Grade **7** - Adopted: **2013**

STRAND / CONTENT STANDARD	**NGSS.MS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK / STANDARD	**MS-ESS3.**	**Earth and Human Activity**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
PERFORMANCE STANDARD / INDICATOR	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
PERFORMANCE STANDARD / INDICATOR	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
PERFORMANCE STANDARD / INDICATOR	MS-ESS3-5.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

STRAND / CONTENT STANDARD	**NM.MS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK / STANDARD	**MS-ESS3.**	**Human Impacts**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**

PERFORMANCE STANDARD / INDICATOR	MS-ESS3-3 NM.	Describe the advantages and disadvantages associated with technologies related to local industries and energy production.

STRAND / CONTENT STANDARD	**NGSS.MS-ETS.**	**ENGINEERING DESIGN**
BENCHMARK / STANDARD	**MS-ETS1.**	**Engineering Design**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
PERFORMANCE STANDARD / INDICATOR	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
PERFORMANCE STANDARD / INDICATOR	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

STRAND / CONTENT STANDARD	**NGSS.MS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK / STANDARD	**MS-ESS3.**	**Earth and Human Activity**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
PERFORMANCE STANDARD / INDICATOR	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
PERFORMANCE STANDARD / INDICATOR	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
PERFORMANCE STANDARD / INDICATOR	MS-ESS3-5.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

STRAND / CONTENT STANDARD	**NM.MS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK / STANDARD	**MS-ESS3.**	**Human Impacts**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	MS-ESS3-3 NM.	Describe the advantages and disadvantages associated with technologies related to local industries and energy production.

STRAND / CONTENT STANDARD	**NGSS.MS-ETS.**	**ENGINEERING DESIGN**
BENCHMARK / STANDARD	**MS-ETS1.**	**Engineering Design**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
PERFORMANCE STANDARD / INDICATOR	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
PERFORMANCE STANDARD / INDICATOR	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

New Mexico Content Standards

Technology Education

Grade **7** - Adopted: **2019**

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.2.**	**Level 2 (Ages 11-14)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**2-AP.**	**Algorithms & Programming**
PERFORMANCE STANDARD / INDICATOR		**Algorithms**
INDICATOR	2-AP-10.	Use flowcharts and/or pseudocode to address complex problems as algorithms. (P4.4, P4.1)

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**

BENCHMARK / STANDARD	**CSTA.2.**	**Level 2 (Ages 11-14)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**2-AP.**	**Algorithms & Programming**
PERFORMANCE STANDARD / INDICATOR		**Modularity**
INDICATOR	2-AP-13.	Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. (P3.2)

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.2.**	**Level 2 (Ages 11-14)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**2-AP.**	**Algorithms & Programming**
PERFORMANCE STANDARD / INDICATOR		**Program Development**
INDICATOR	2-AP-15.	Seek and incorporate feedback from team members and users to refine a solution that meets user needs. (P2.3, P1.1)

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.2.**	**Level 2 (Ages 11-14)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**2-IC.**	**Impacts of Computing**
PERFORMANCE STANDARD / INDICATOR		**Social Interactions**
INDICATOR	2-IC-22.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. (P2.4, P5.2)

New Mexico Content Standards

Technology Education

Grade **8** - Adopted: **2019**

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.2.**	**Level 2 (Ages 11-14)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**2-AP.**	**Algorithms & Programming**
PERFORMANCE STANDARD / INDICATOR		**Algorithms**

INDICATOR	2-AP-10.	Use flowcharts and/or pseudocode to address complex problems as algorithms. (P4.4, P4.1)

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.2.**	**Level 2 (Ages 11-14)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**2-AP.**	**Algorithms & Programming**
PERFORMANCE STANDARD / INDICATOR		**Modularity**
INDICATOR	2-AP-13.	Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. (P3.2)

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.2.**	**Level 2 (Ages 11-14)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**2-AP.**	**Algorithms & Programming**
PERFORMANCE STANDARD / INDICATOR		**Program Development**
INDICATOR	2-AP-15.	Seek and incorporate feedback from team members and users to refine a solution that meets user needs. (P2.3, P1.1)

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.2.**	**Level 2 (Ages 11-14)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**2-IC.**	**Impacts of Computing**
PERFORMANCE STANDARD / INDICATOR		**Social Interactions**
INDICATOR	2-IC-22.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. (P2.4, P5.2)

New York State Learning Standards and Core Curriculum

Mathematics

Grade **7** - Adopted: **2017/Updated 2019**

STRAND / DOMAIN / UNIFYING THEME		**Mathematical Practices**

CATEGORY / CLUSTER / KEY IDEA	MP.1	Make sense of problems and persevere in solving them.
CATEGORY / CLUSTER / KEY IDEA	MP.2	Reason abstractly and quantitatively.
CATEGORY / CLUSTER / KEY IDEA	MP.3	Construct viable arguments and critique the reasoning of others.
CATEGORY / CLUSTER / KEY IDEA	MP.4	Model with mathematics.
CATEGORY / CLUSTER / KEY IDEA	MP.6	Attend to precision.
CATEGORY / CLUSTER / KEY IDEA	MP.7	Look for and make use of structure.

New York State Learning Standards and Core Curriculum

Mathematics

Grade **8** - Adopted: **2017/Updated 2019**

STRAND / DOMAIN / UNIFYING THEME		Mathematical Practices
CATEGORY / CLUSTER / KEY IDEA	MP.1	Make sense of problems and persevere in solving them.
CATEGORY / CLUSTER / KEY IDEA	MP.2	Reason abstractly and quantitatively.
CATEGORY / CLUSTER / KEY IDEA	MP.3	Construct viable arguments and critique the reasoning of others.
CATEGORY / CLUSTER / KEY IDEA	MP.4	Model with mathematics.
CATEGORY / CLUSTER / KEY IDEA	MP.6	Attend to precision.
CATEGORY / CLUSTER / KEY IDEA	MP.7	Look for and make use of structure.

STRAND / DOMAIN / UNIFYING THEME	**NY.MS.4.**	**Energy**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-PS3-5.	Construct, use, and present an argument to support the claim that when work is done on or by a system, the energy of the system changes as energy is transferred to or from the system.

STRAND / DOMAIN / UNIFYING THEME	**NY.MS.13.**	**Earth's Systems**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geologic processes.

STRAND / DOMAIN / UNIFYING THEME	**NY.MS.14.**	**Weather and Climate**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ESS3-5.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

STRAND / DOMAIN / UNIFYING THEME	**NY.MS.15.**	**Human Impacts**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

STANDARD / CONCEPTUAL UNDERSTANDING	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STRAND / DOMAIN / UNIFYING THEME	**NY.MS.ED.**	**Engineering Design**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **7** - Adopted: **2011**

STRAND / DOMAIN / UNIFYING THEME	**NY.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Key Ideas and Details**
STANDARD / CONCEPTUAL UNDERSTANDING	6-8.RST.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
STANDARD / CONCEPTUAL UNDERSTANDING	6-8.RST.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

STRAND / DOMAIN / UNIFYING THEME	**NY.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Craft and Structure**
STANDARD / CONCEPTUAL UNDERSTANDING	6-8.RST.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

STANDARD / CONCEPTUAL UNDERSTANDING	6-8.RST.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

STRAND / DOMAIN / UNIFYING THEME	**NY.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Integration of Knowledge and Ideas**
STANDARD / CONCEPTUAL UNDERSTANDING	6-8.RST.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

STRAND / DOMAIN / UNIFYING THEME	**NY.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Range of Reading and Level of Text Complexity**
STANDARD / CONCEPTUAL UNDERSTANDING	6-8.RST.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

STRAND / DOMAIN / UNIFYING THEME	**NY.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Text Types and Purposes**
STANDARD / CONCEPTUAL UNDERSTANDING	**6-8.WHST.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
EXPECTATION / CONTENT SPECIFICATION	6-8.WHST.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.

STRAND / DOMAIN / UNIFYING THEME	**NY.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Production and Distribution of Writing**
STANDARD / CONCEPTUAL UNDERSTANDING	6-8.WHST.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

STANDARD / CONCEPTUAL UNDERSTANDING	6-8.WHST.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

New York State Learning Standards and Core Curriculum

Science

Grade **8** - Adopted: **2016**

STRAND / DOMAIN / UNIFYING THEME	**NY.MS.4.**	**Energy**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-PS3-5.	Construct, use, and present an argument to support the claim that when work is done on or by a system, the energy of the system changes as energy is transferred to or from the system.
STRAND / DOMAIN / UNIFYING THEME	**NY.MS.13.**	**Earth's Systems**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geologic processes.
STRAND / DOMAIN / UNIFYING THEME	**NY.MS.14.**	**Weather and Climate**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ESS3-5.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.
STRAND / DOMAIN / UNIFYING THEME	**NY.MS.15.**	**Human Impacts**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

STANDARD / CONCEPTUAL UNDERSTANDING	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STRAND / DOMAIN / UNIFYING THEME	**NY.MS.ED.**	**Engineering Design**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **8** - Adopted: **2011**

STRAND / DOMAIN / UNIFYING THEME	**NY.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Key Ideas and Details**
STANDARD / CONCEPTUAL UNDERSTANDING	6-8.RST.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
STANDARD / CONCEPTUAL UNDERSTANDING	6-8.RST.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

STRAND / DOMAIN / UNIFYING THEME	**NY.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Craft and Structure**
STANDARD / CONCEPTUAL UNDERSTANDING	6-8.RST.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

STANDARD / CONCEPTUAL UNDERSTANDING	6-8.RST.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

STRAND / DOMAIN / UNIFYING THEME	**NY.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Integration of Knowledge and Ideas**
STANDARD / CONCEPTUAL UNDERSTANDING	6-8.RST.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

STRAND / DOMAIN / UNIFYING THEME	**NY.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Range of Reading and Level of Text Complexity**
STANDARD / CONCEPTUAL UNDERSTANDING	6-8.RST.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

STRAND / DOMAIN / UNIFYING THEME	**NY.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Text Types and Purposes**
STANDARD / CONCEPTUAL UNDERSTANDING	**6-8.WHST.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
EXPECTATION / CONTENT SPECIFICATION	6-8.WHST.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.

STRAND / DOMAIN / UNIFYING THEME	**NY.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Production and Distribution of Writing**
STANDARD / CONCEPTUAL UNDERSTANDING	6-8.WHST.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

STANDARD / CONCEPTUAL UNDERSTANDING	6-8.WHST.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

New York State Learning Standards and Core Curriculum

Technology Education

Grade **7** - Adopted: **1996**

STRAND / DOMAIN / UNIFYING THEME	**NY.2.**	**Information Systems: Students will access, generate, process, and transfer information using appropriate technologies.**
CATEGORY / CLUSTER / KEY IDEA	**2.3.**	**Information Systems: Information technology can have positive and negative impacts on society, depending upon how it is used.**
STANDARD / CONCEPTUAL UNDERSTANDING	2.3.2.	Students describe applications of information technology in mathematics, science, and other technologies that address needs and solve problems in the community.
STRAND / DOMAIN / UNIFYING THEME	**NY.5.**	**Technology: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.**
CATEGORY / CLUSTER / KEY IDEA	**5.1.**	**Engineering Design: Engineering design is an iterative process involving modeling and optimization used to develop technological solutions to problems within given constraints.**
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.1.	Students identify needs and opportunities for technical solutions from an investigation of situations of general or social interest.
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.3.	Students consider constraints and generate several ideas for alternative solutions, using group and individual ideation techniques (group discussion, brainstorming, forced connections, role play); defer judgment until a number of ideas have been generated; evaluate (critique) ideas; and explain why the chosen solution is optimal.
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.4.	Students develop plans, including drawings with measurements and details of construction, and construct a model of the solution, exhibiting a degree of craftsmanship.
STRAND / DOMAIN / UNIFYING THEME	**NY.5.**	**Technology: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.**
CATEGORY / CLUSTER / KEY IDEA	**5.4.**	**Technological Systems: Technological systems are designed to achieve specific results and produce outputs, such as products, structures, services, energy, or other systems.**
STANDARD / CONCEPTUAL UNDERSTANDING	5.4.2.	Students assemble, operate, and explain the operation of simple open- and closed-loop electrical, electronic, mechanical, and pneumatic systems.

New York State Learning Standards and Core Curriculum

Technology Education

Grade **8** - Adopted: **1996**

STRAND / DOMAIN / UNIFYING THEME	**NY.2.**	**Information Systems: Students will access, generate, process, and transfer information using appropriate technologies.**
CATEGORY / CLUSTER / KEY IDEA	**2.3.**	**Information Systems: Information technology can have positive and negative impacts on society, depending upon how it is used.**
STANDARD / CONCEPTUAL UNDERSTANDING	2.3.2.	Students describe applications of information technology in mathematics, science, and other technologies that address needs and solve problems in the community.

STRAND / DOMAIN / UNIFYING THEME	**NY.5.**	**Technology: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.**
CATEGORY / CLUSTER / KEY IDEA	**5.1.**	**Engineering Design: Engineering design is an iterative process involving modeling and optimization used to develop technological solutions to problems within given constraints.**
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.1.	Students identify needs and opportunities for technical solutions from an investigation of situations of general or social interest.
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.3.	Students consider constraints and generate several ideas for alternative solutions, using group and individual ideation techniques (group discussion, brainstorming, forced connections, role play); defer judgment until a number of ideas have been generated; evaluate (critique) ideas; and explain why the chosen solution is optimal.
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.4.	Students develop plans, including drawings with measurements and details of construction, and construct a model of the solution, exhibiting a degree of craftsmanship.

STRAND / DOMAIN / UNIFYING THEME	**NY.5.**	**Technology: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.**
CATEGORY / CLUSTER / KEY IDEA	**5.4.**	**Technological Systems: Technological systems are designed to achieve specific results and produce outputs, such as products, structures, services, energy, or other systems.**
STANDARD / CONCEPTUAL UNDERSTANDING	5.4.2.	Students assemble, operate, and explain the operation of simple open- and closed-loop electrical, electronic, mechanical, and pneumatic systems.

North Carolina Standard Course of Study

Mathematics

Grade **7** - Adopted: **2017/IMPL 2018**

CONTENT AREA / STRAND		**Standards for Mathematical Practice**
STRAND / ESSENTIAL STANDARD	MP.1.	Make sense of problems and persevere in solving them.

STRAND / ESSENTIAL STANDARD	MP.2.	Reason abstractly and quantitatively.
STRAND / ESSENTIAL STANDARD	MP.3.	Construct viable arguments and critique the reasoning of others.
STRAND / ESSENTIAL STANDARD	MP.4.	Model with mathematics.
STRAND / ESSENTIAL STANDARD	MP.6.	Attend to precision.
STRAND / ESSENTIAL STANDARD	MP.7.	Look for and make use of structure.

North Carolina Standard Course of Study
Mathematics
Grade **8** - Adopted: **2017/IMPL 2018**

CONTENT AREA / STRAND		Standards for Mathematical Practice
STRAND / ESSENTIAL STANDARD	MP.1.	Make sense of problems and persevere in solving them.
STRAND / ESSENTIAL STANDARD	MP.2.	Reason abstractly and quantitatively.
STRAND / ESSENTIAL STANDARD	MP.3.	Construct viable arguments and critique the reasoning of others.
STRAND / ESSENTIAL STANDARD	MP.4.	Model with mathematics.
STRAND / ESSENTIAL STANDARD	MP.6.	Attend to precision.
STRAND / ESSENTIAL STANDARD	MP.7.	Look for and make use of structure.

North Carolina Standard Course of Study
Science
Grade **7** - Adopted: **2010**

CONTENT AREA / STRAND	NC.7.P.	Physical Science

STRAND / ESSENTIAL STANDARD		**Energy: Conservation and Transfer**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**7.P.2.**	**Understand forms of energy, energy transfer and transformation and conservation in mechanical systems.**
CLARIFYING OBJECTIVE	7.P.2.2.	Explain how energy can be transformed from one form to another (specifically potential energy and kinetic energy) using a model or diagram of a moving object (roller coaster, pendulum, or cars on ramps as examples).
CONTENT AREA / STRAND	**NC.7.E.**	**Earth Science**
STRAND / ESSENTIAL STANDARD		**Earth Systems, Structures and Processes**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**7.E.1.**	**Understand how the cycling of matter (water and gases) in and out of the atmosphere relates to Earth's atmosphere, weather and climate and the effects of the atmosphere on humans.**
CLARIFYING OBJECTIVE	7.E.1.6.	Conclude that the good health of humans requires: monitoring the atmosphere, maintaining air quality and stewardship.
CONTENT AREA / STRAND	**NC.CC.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / ESSENTIAL STANDARD		**Key Ideas and Details**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.RST.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.RST.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
CONTENT AREA / STRAND	**NC.CC.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / ESSENTIAL STANDARD		**Craft and Structure**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.RST.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.RST.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
CONTENT AREA / STRAND	**NC.CC.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**

STRAND / ESSENTIAL STANDARD		**Integration of Knowledge and Ideas**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.RST.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CONTENT AREA / STRAND	**NC.CC.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / ESSENTIAL STANDARD		**Range of Reading and Level of Text Complexity**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.RST.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

CONTENT AREA / STRAND	**NC.CC.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / ESSENTIAL STANDARD		**Text Types and Purposes**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**6-8.WHST.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
CLARIFYING OBJECTIVE	6-8.WHST.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.

CONTENT AREA / STRAND	**NC.CC.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / ESSENTIAL STANDARD		**Production and Distribution of Writing**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.WHST.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.WHST.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

North Carolina Standard Course of Study

Science

Grade **8** - Adopted: **2010**

CONTENT AREA / STRAND	**NC.8.P.**	**Physical Science**
STRAND / ESSENTIAL STANDARD		**Energy: Conservation and Transfer**

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	8.P.2.	Explain the environmental implications associated with the various methods of obtaining, managing, and using energy resources.
CLARIFYING OBJECTIVE	8.P.2.1.	Explain the environmental consequences of the various methods of obtaining, transforming and distributing energy.
CLARIFYING OBJECTIVE	8.P.2.2.	Explain the implications of the depletion of renewable and nonrenewable energy resources and the importance of conservation.

CONTENT AREA / STRAND	NC.CC.6-8.RST.	Reading Standards for Literacy in Science and Technical Subjects
STRAND / ESSENTIAL STANDARD		Key Ideas and Details
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.RST.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.RST.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

CONTENT AREA / STRAND	NC.CC.6-8.RST.	Reading Standards for Literacy in Science and Technical Subjects
STRAND / ESSENTIAL STANDARD		Craft and Structure
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.RST.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.RST.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

CONTENT AREA / STRAND	NC.CC.6-8.RST.	Reading Standards for Literacy in Science and Technical Subjects
STRAND / ESSENTIAL STANDARD		Integration of Knowledge and Ideas
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.RST.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CONTENT AREA / STRAND	NC.CC.6-8.RST.	Reading Standards for Literacy in Science and Technical Subjects

STRAND / ESSENTIAL STANDARD		**Range of Reading and Level of Text Complexity**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.RST.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

CONTENT AREA / STRAND	**NC.CC.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / ESSENTIAL STANDARD		**Text Types and Purposes**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**6-8.WHST.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
CLARIFYING OBJECTIVE	6-8.WHST.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.

CONTENT AREA / STRAND	**NC.CC.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / ESSENTIAL STANDARD		**Production and Distribution of Writing**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.WHST.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	6-8.WHST.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

North Carolina Standard Course of Study

Technology Education

Grade **7** - Adopted: **2020 (ISTE-S)**

CONTENT AREA / STRAND		**Digital Learning Standards**
STRAND / ESSENTIAL STANDARD	**ISTE-S.3.**	**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.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.3.d.	Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

CONTENT AREA / STRAND		**Digital Learning Standards**
STRAND / ESSENTIAL STANDARD	**ISTE-S.4.**	**Innovative Designer: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.4.a.	Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.4.b.	Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

CONTENT AREA / STRAND		Digital Learning Standards
STRAND / ESSENTIAL STANDARD	**ISTE-S.5.**	**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.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.5.a.	Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.5.b.	Students 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.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.5.d.	Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Grade **7** - Adopted: **2020**

CONTENT AREA / STRAND		NC K-12 Computer Science Standards
STRAND / ESSENTIAL STANDARD		**Grades 6-8 (Ages 11-14)**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Algorithms & Programming**
CLARIFYING OBJECTIVE		**Algorithms**
INDICATOR	68-AP-01.	Implement flowcharts and/or pseudocode to address complex problems as algorithms.

CONTENT AREA / STRAND		NC K-12 Computer Science Standards
STRAND / ESSENTIAL STANDARD		**Grades 6-8 (Ages 11-14)**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Algorithms & Programming**
CLARIFYING OBJECTIVE		**Modularity**

INDICATOR	68-AP-05.	Organize problems and subproblems into parts.

CONTENT AREA / STRAND		NC K-12 Computer Science Standards
STRAND / ESSENTIAL STANDARD		Grades 6-8 (Ages 11-14)
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		Algorithms & Programming
CLARIFYING OBJECTIVE		Program Development
INDICATOR	68-AP-10.	Systematically test and refine programs using a range of test cases.

CONTENT AREA / STRAND		NC K-12 Computer Science Standards
STRAND / ESSENTIAL STANDARD		Grades 6-8 (Ages 11-14)
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		Impacts of Computing
CLARIFYING OBJECTIVE		Social Interactions
INDICATOR	68-IC-05.	Collaborate with many contributors to create a computational artifact.

North Carolina Standard Course of Study
Technology Education
Grade **8** - Adopted: **2020 (ISTE-S)**

CONTENT AREA / STRAND		Digital Learning Standards
STRAND / ESSENTIAL STANDARD	ISTE-S.3.	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.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.3.d.	Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

CONTENT AREA / STRAND		Digital Learning Standards
STRAND / ESSENTIAL STANDARD	ISTE-S.4.	Innovative Designer: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.4.a.	Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.4.b.	Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

CONTENT AREA / STRAND		Digital Learning Standards
STRAND / ESSENTIAL STANDARD	**ISTE-S.5.**	**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.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.5.a.	Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.5.b.	Students 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.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.5.d.	Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Grade **8** - Adopted: **2020**

CONTENT AREA / STRAND		NC K-12 Computer Science Standards
STRAND / ESSENTIAL STANDARD		**Grades 6-8 (Ages 11-14)**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Algorithms & Programming**
CLARIFYING OBJECTIVE		**Algorithms**
INDICATOR	68-AP-01.	Implement flowcharts and/or pseudocode to address complex problems as algorithms.

CONTENT AREA / STRAND		NC K-12 Computer Science Standards
STRAND / ESSENTIAL STANDARD		**Grades 6-8 (Ages 11-14)**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Algorithms & Programming**
CLARIFYING OBJECTIVE		**Modularity**
INDICATOR	68-AP-05.	Organize problems and subproblems into parts.

CONTENT AREA / STRAND		NC K-12 Computer Science Standards
STRAND / ESSENTIAL STANDARD		Grades 6-8 (Ages 11-14)
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		Algorithms & Programming
CLARIFYING OBJECTIVE		Program Development
INDICATOR	68-AP-10.	Systematically test and refine programs using a range of test cases.

CONTENT AREA / STRAND		NC K-12 Computer Science Standards
STRAND / ESSENTIAL STANDARD		Grades 6-8 (Ages 11-14)
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		Impacts of Computing
CLARIFYING OBJECTIVE		Social Interactions
INDICATOR	68-IC-05.	Collaborate with many contributors to create a computational artifact.

North Dakota Content Standards

Mathematics

Grade **7** - Adopted: **2017**

CONTENT STANDARD		Standards for Mathematical Practice
BENCHMARK	MP.1	Make sense of problems and persevere in solving them.
BENCHMARK	MP.2	Reason abstractly and quantitatively.
BENCHMARK	MP.3	Construct viable arguments and critique the reasoning of others.
BENCHMARK	MP.4	Model with mathematics.
BENCHMARK	MP.6	Attend to precision.
BENCHMARK	MP.7	Look for and make use of structure.

North Dakota Content Standards

Mathematics

Grade **8** - Adopted: **2017**

CONTENT STANDARD		Standards for Mathematical Practice

BENCHMARK	MP.1	Make sense of problems and persevere in solving them.
BENCHMARK	MP.2	Reason abstractly and quantitatively.
BENCHMARK	MP.3	Construct viable arguments and critique the reasoning of others.
BENCHMARK	MP.4	Model with mathematics.
BENCHMARK	MP.6	Attend to precision.
BENCHMARK	MP.7	Look for and make use of structure.

North Dakota Content Standards

Science

Grade **7** - Adopted: **2019**

CONTENT STANDARD		**Science and Engineering Practices**
BENCHMARK	**2**	**Developing and using models**
GRADE LEVEL EXPECTATION		Modeling in K-12 builds on prior experiences and progresses to include using and developing models (i.e., diagrams, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.
CONTENT STANDARD		**Science and Engineering Practices**
BENCHMARK	**6**	**Constructing explanations and designing solutions**
GRADE LEVEL EXPECTATION		Constructing explanations and designing solutions in K-12 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.
CONTENT STANDARD		**Earth and Space Science (ESS)**
BENCHMARK	**MS-ESS3.**	**Earth and Human Activity**
GRADE LEVEL EXPECTATION	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
GRADE LEVEL EXPECTATION	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
GRADE LEVEL EXPECTATION	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
GRADE LEVEL EXPECTATION	MS-ESS3-5.	Investigate factors that have caused changes in global temperatures over time.
CONTENT STANDARD		**Engineering & Technology (ET)**
BENCHMARK	**MS-ET1.**	**Engineering & Technology**

GRADE LEVEL EXPECTATION	MS-ET1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
GRADE LEVEL EXPECTATION	MS-ET1-2.	Evaluate competing design solutions using systematic process to determine how well they meet the criteria and constraints of the problem.
GRADE LEVEL EXPECTATION	MS-ET1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

North Dakota Content Standards

Science

Grade **8** - Adopted: **2019**

CONTENT STANDARD		Science and Engineering Practices
BENCHMARK	**2**	**Developing and using models**
GRADE LEVEL EXPECTATION		Modeling in K-12 builds on prior experiences and progresses to include using and developing models (i.e., diagrams, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

CONTENT STANDARD		Science and Engineering Practices
BENCHMARK	**6**	**Constructing explanations and designing solutions**
GRADE LEVEL EXPECTATION		Constructing explanations and designing solutions in K-12 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.

CONTENT STANDARD		Earth and Space Science (ESS)
BENCHMARK	**MS-ESS3.**	**Earth and Human Activity**
GRADE LEVEL EXPECTATION	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
GRADE LEVEL EXPECTATION	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
GRADE LEVEL EXPECTATION	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
GRADE LEVEL EXPECTATION	MS-ESS3-5.	Investigate factors that have caused changes in global temperatures over time.

CONTENT STANDARD		Engineering & Technology (ET)
BENCHMARK	**MS-ET1.**	**Engineering & Technology**
GRADE LEVEL EXPECTATION	MS-ET1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

GRADE LEVEL EXPECTATION	MS-ET1-2.	Evaluate competing design solutions using systematic process to determine how well they meet the criteria and constraints of the problem.
GRADE LEVEL EXPECTATION	MS-ET1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

North Dakota Content Standards

Technology Education

Grade **7** - Adopted: **2012**

CONTENT STANDARD		**Library and Technology**
BENCHMARK		**Media and Technology Literacy**
GRADE LEVEL EXPECTATION		**Creative and Innovative Processes and Products**
INDICATOR	6-8.MTL.7.	Create unique products and processes by selecting digital resources, tools, and formats for a real-world task.

Grade **7** - Adopted: **2019**

CONTENT STANDARD		**Computer Science and Cybersecurity Standards**
BENCHMARK		**Computational Thinking**
GRADE LEVEL EXPECTATION		**Problem Solving & Algorithms**
INDICATOR		**Strategies for understanding and solving problems.**
INDICATOR	7.PSA.1.	Modify and test an algorithm to solve a problem.
INDICATOR	7.PSA.2.	Continued growth debugging a program that includes sequencing, loops, or conditionals.

North Dakota Content Standards

Technology Education

Grade **8** - Adopted: **2012**

CONTENT STANDARD		**Library and Technology**
BENCHMARK		**Media and Technology Literacy**
GRADE LEVEL EXPECTATION		**Creative and Innovative Processes and Products**
INDICATOR	6-8.MTL.7.	Create unique products and processes by selecting digital resources, tools, and formats for a real-world task.

Grade **8** - Adopted: **2019**

CONTENT STANDARD		**Computer Science and Cybersecurity Standards**
BENCHMARK		**Computational Thinking**
GRADE LEVEL EXPECTATION		**Problem Solving & Algorithms**
INDICATOR		**Strategies for understanding and solving problems.**
INDICATOR	8.PSA.1.	Create and test an algorithm to solve a problem across disciplines.

INDICATOR	8.PSA.2.	Continued growth debugging a program that includes sequencing, loops, or conditionals.

Northern Territory Curriculum
Mathematics
Grade **7** - Adopted: **2015**

STRAND / DOMAIN	**ACMNA.7.**	**Number and Algebra**
OUTCOME / INDICATOR	**ACMNA. 7.1.**	**Number and place value**
INDICATOR	**ACMNA. 7.1.3.**	**Apply the associative, commutative and distributive laws to aid mental and written computation (ACMNA151)**
INDICATOR	ACMNA.7 .1.3.1.	Understanding that arithmetic laws are powerful ways of describing and simplifying calculations

STRAND / DOMAIN	**ACMNA.7.**	**Number and Algebra**
OUTCOME / INDICATOR	**ACMNA. 7.4.**	**Patterns and algebra**
INDICATOR	**ACMNA. 7.4.1.**	**Introduce the concept of variables as a way of representing numbers using letters (ACMNA175)**
INDICATOR	ACMNA.7 .4.1.1.	Understanding that arithmetic laws are powerful ways of describing and simplifying calculations and that using these laws leads to the generality of algebra

Northern Territory Curriculum
Mathematics
Grade **8** - Adopted: **2015**

STRAND / DOMAIN	**ACMNA.8.**	**Number and Algebra**
OUTCOME / INDICATOR	**ACMNA. 8.4.**	**Patterns and algebra**
INDICATOR	**ACMNA. 8.4.3.**	**Simplify algebraic expressions involving the four operations (ACMNA192)**
INDICATOR	ACMNA. 8.4.3.1.	Understanding that the laws used with numbers can also be used with algebra

Northern Territory Curriculum
Science
Grade **7** - Adopted: **2016**

STRAND / DOMAIN	**ACSSU.7.**	**Science Understanding**
OUTCOME / INDICATOR	**ACSSU. 7.3.**	**Earth and space sciences**
INDICATOR	**ACSSU. 7.3.2.**	**Some of Earth’s resources are renewable, including water that cycles through the environment, but others are non- renewable (ACSSU116)**
INDICATOR	ACSSU.7 .3.2.1.	Considering what is meant by the term ‘renewable’ in relation to the Earth’s resources
INDICATOR	ACSSU.7 .3.2.2.	Considering timescales for regeneration of resources

INDICATOR	ACSSU.7.3.2.3.	Comparing renewable and non-renewable energy sources, including how they are used in a range of situations

STRAND / DOMAIN	**ACSHE.7.**	**Science as a Human Endeavour**
OUTCOME / INDICATOR	**ACSHE.7.2.**	**Use and influence of science**
INDICATOR	**ACSHE.7.2.2.**	**People use science understanding and skills in their occupations and these have influenced the development of practices in areas of human activity (ACSHE121)**
INDICATOR	ACSHE.7.2.2.1.	Investigating everyday applications of physical separation techniques such as filtering, sorting waste materials, reducing pollution, extracting products from plants, separating blood products and cleaning up oil spills

STRAND / DOMAIN	**ACSIS.7.**	**Science Inquiry Skills**
OUTCOME / INDICATOR	**ACSIS.7.1.**	**Questioning and predicting**
INDICATOR	**ACSIS.7.1.1.**	**Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (ACSIS124)**
INDICATOR	ACSIS.7.1.1.2.	Recognising that the solution of some questions and problems requires consideration of social, cultural, economic or moral aspects rather than or as well as scientific investigation

STRAND / DOMAIN	**ACSIS.7.**	**Science Inquiry Skills**
OUTCOME / INDICATOR	**ACSIS.7.2.**	**Planning and conducting**
INDICATOR	**ACSIS.7.2.2.**	**Measure and control variables, select equipment appropriate to the task and collect data with accuracy (ACSIS126)**
INDICATOR	ACSIS.7.2.2.3.	Using specialised equipment to increase the accuracy of measurement within an investigation

STRAND / DOMAIN	**ACSIS.7.**	**Science Inquiry Skills**
OUTCOME / INDICATOR	**ACSIS.7.5.**	**Communicating**
INDICATOR	**ACSIS.7.5.1.**	**Communicate ideas, findings and evidence based solutions to problems using scientific language, and representations, using digital technologies as appropriate (ACSIS133)**
INDICATOR	ACSIS.7.5.1.1.	Presenting the outcomes of research using effective forms of representation of data or ideas and scientific language that is appropriate for the target audience

Northern Territory Curriculum

Science

Grade **8** - Adopted: **2016**

STRAND / DOMAIN	**ACSIS.8.**	**Science Inquiry Skills**
OUTCOME / INDICATOR	**ACSIS.8.1.**	**Questioning and predicting**
INDICATOR	**ACSIS.8.1.1.**	**Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (ACSIS139)**

INDICATOR	ACSIS.8.1.1.2.	Recognising that the solution of some questions and problems requires consideration of social, cultural, economic or moral aspects rather than or as well as scientific investigation

STRAND / DOMAIN	**ACSIS.8.**	**Science Inquiry Skills**
OUTCOME / INDICATOR	**ACSIS.8.2.**	**Planning and conducting**
INDICATOR	**ACSIS.8.2.2.**	**Measure and control variables, select equipment appropriate to the task and collect data with accuracy (ACSIS141)**
INDICATOR	ACSIS.8.2.2.1.	Using specialised equipment to increase the accuracy of measurement within an investigation

STRAND / DOMAIN	**ACSIS.8.**	**Science Inquiry Skills**
OUTCOME / INDICATOR	**ACSIS.8.5.**	**Communicating**
INDICATOR	**ACSIS.8.5.1.**	**Communicate ideas, findings and evidence based solutions to problems using scientific language, and representations, using digital technologies as appropriate (ACSIS148)**
INDICATOR	ACSIS.8.5.1.1.	Using digital technologies to construct a range of text types to present science ideas
INDICATOR	ACSIS.8.5.1.2.	Selecting and using appropriate language and representations to communicate science ideas within a specified text type and for a specified audience

Northern Territory Curriculum

Technology Education

Grade **7** - Adopted: **2016 (ACARA)**

STRAND / DOMAIN		**Design and Technologies**
OUTCOME / INDICATOR	**ACTDEK.7-8.**	**Design and Technologies Knowledge and Understanding**
INDICATOR	**ACTDEK.7-8.2.**	**Analyse how motion, force and energy are used to manipulate and control electromechanical systems when designing simple, engineered solutions (ACTDEK031)**
INDICATOR	ACTDEK.7-8.2.1.	Investigating influences impacting on manufactured products and processes such as historical developments, society, new materials, control systems and biomimicry, for example the development of Velcro
INDICATOR	ACTDEK.7-8.2.2.	Experimenting to select the most appropriate principles and systems on which to base design ideas, for example structural components to be tested for strength
INDICATOR	ACTDEK.7-8.2.3.	Calculating an engineered system's outputs, for example speed, brightness of light, volume of sound
INDICATOR	ACTDEK.7-8.2.4.	Producing prototypes and jigs to test functionality, including the use of rapid prototyping tools such as 3D printers
INDICATOR	ACTDEK.7-8.2.5.	Using code to control systems, for example code to program a microcontroller or a simple, object-based coding application to program a system such as a remote-controlled car or simple robotic arm
INDICATOR	ACTDEK.7-8.2.6.	Investigating components, tools and equipment, for example testing the durability of batteries, determining the effective range of wireless devices

STRAND / DOMAIN		Design and Technologies
OUTCOME / INDICATOR	**ACTDEK.7-8.**	**Design and Technologies Knowledge and Understanding**
INDICATOR	**ACTDEK.7-8.3.**	**Analyse how food and fibre are produced when designing managed environments and how these can become more sustainable (ACTDEK032)**
INDICATOR	ACTDEK.7-8.3.1.	Comparing land and water management methods in contemporary Australian food and fibre production with traditional Aboriginal systems and countries of Asia, for example minimum-tillage cropping, water-efficient irrigation

STRAND / DOMAIN		Design and Technologies
OUTCOME / INDICATOR	**ACTDEP.7-8.**	**Design and Technologies Processes and Production Skills**
INDICATOR	**ACTDEP.7-8.2.**	**Generate, develop, test and communicate design ideas, plans and processes for various audiences using appropriate technical terms and technologies including graphical representation techniques (ACTDEP036)**
INDICATOR	ACTDEP.7-8.2.1.	Using a variety of critical and creative thinking strategies such as brainstorming, sketching, 3-D modelling and experimenting to generate innovative design ideas
INDICATOR	ACTDEP.7-8.2.2.	Considering which ideas to further explore and investigating the benefits and drawbacks of ideas, for example using digital polling to capture the views of different groups in the community
INDICATOR	ACTDEP.7-8.2.3.	Identifying factors that may hinder or enhance project development, for example intercultural understanding
INDICATOR	ACTDEP.7-8.2.4.	Developing models, prototypes or samples using a range of materials, tools and equipment to test the functionality of ideas
INDICATOR	ACTDEP.7-8.2.5.	Producing annotated concept sketches and drawings, using: technical terms, scale, symbols, pictorial and aerial views to draw environments; production drawings, orthogonal drawings; patterns and templates to explain design ideas
INDICATOR	ACTDEP.7-8.2.6.	Documenting and communicating the generation and development of design ideas for an intended audience, for example developing a digital portfolio with images and text which clearly communicates each step of a design process

STRAND / DOMAIN		Digital Technologies
OUTCOME / INDICATOR	**ACTDIP.7-8.**	**Digital Technologies Processes and Production Skills**
INDICATOR	**ACTDIP.7-8.7.**	**Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors (ACTDIP029)**
INDICATOR	ACTDIP.7-8.7.2.	checking the accuracy of an algorithm before it is implemented, for example desk checking it with test data to see if the instructions produce the expected results
INDICATOR	ACTDIP.7-8.7.4.	using structured English to express algorithmic instructions, for example using conventional statements such as ‘while’ and ‘endwhile’ in a ‘while loop’ when describing interactive instruction

STRAND / DOMAIN		Digital Technologies

OUTCOME / INDICATOR	**ACTDIP.7-8.**	**Digital Technologies Processes and Production Skills**
INDICATOR	**ACTDIP.7-8.8.**	**Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language (ACTDIP030)**
INDICATOR	ACTDIP.7-8.8.1.	developing and modifying digital solutions by implementing instructions contained in algorithms through programs
INDICATOR	ACTDIP.7-8.8.3.	programming a robot to recognise particular objects and to treat them differently, for example choose objects based on colour

STRAND / DOMAIN		**Digital Technologies**
OUTCOME / INDICATOR	**ACTDIP.7-8.**	**Digital Technologies Processes and Production Skills**
INDICATOR	**ACTDIP.7-8.9.**	**Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)**
INDICATOR	ACTDIP.7-8.9.1.	comparing student solutions with existing solutions that solve similar problems, for example identifying differences in the user interface of two adventure games and explaining how these differences affect the usability or appeal of the game
INDICATOR	ACTDIP.7-8.9.2.	judging the quality of a student solution based on specific criteria such as meeting an economic need or contributing to social sustainability

Northern Territory Curriculum
Technology Education
Grade **8** - Adopted: **2016 (ACARA)**

STRAND / DOMAIN		**Design and Technologies**
OUTCOME / INDICATOR	**ACTDEK.7-8.**	**Design and Technologies Knowledge and Understanding**
INDICATOR	**ACTDEK.7-8.2.**	**Analyse how motion, force and energy are used to manipulate and control electromechanical systems when designing simple, engineered solutions (ACTDEK031)**
INDICATOR	ACTDEK.7-8.2.1.	Investigating influences impacting on manufactured products and processes such as historical developments, society, new materials, control systems and biomimicry, for example the development of Velcro
INDICATOR	ACTDEK.7-8.2.2.	Experimenting to select the most appropriate principles and systems on which to base design ideas, for example structural components to be tested for strength
INDICATOR	ACTDEK.7-8.2.3.	Calculating an engineered system's outputs, for example speed, brightness of light, volume of sound
INDICATOR	ACTDEK.7-8.2.4.	Producing prototypes and jigs to test functionality, including the use of rapid prototyping tools such as 3D printers
INDICATOR	ACTDEK.7-8.2.5.	Using code to control systems, for example code to program a microcontroller or a simple, object-based coding application to program a system such as a remote-controlled car or simple robotic arm
INDICATOR	ACTDEK.7-8.2.6.	Investigating components, tools and equipment, for example testing the durability of batteries, determining the effective range of wireless devices

STRAND / DOMAIN		**Design and Technologies**
OUTCOME / INDICATOR	**ACTDEK.7-8.**	**Design and Technologies Knowledge and Understanding**
INDICATOR	**ACTDEK.7-8.3.**	**Analyse how food and fibre are produced when designing managed environments and how these can become more sustainable (ACTDEK032)**
INDICATOR	ACTDEK.7-8.3.1.	Comparing land and water management methods in contemporary Australian food and fibre production with traditional Aboriginal systems and countries of Asia, for example minimum-tillage cropping, water-efficient irrigation

STRAND / DOMAIN		**Design and Technologies**
OUTCOME / INDICATOR	**ACTDEP.7-8.**	**Design and Technologies Processes and Production Skills**
INDICATOR	**ACTDEP.7-8.2.**	**Generate, develop, test and communicate design ideas, plans and processes for various audiences using appropriate technical terms and technologies including graphical representation techniques (ACTDEP036)**
INDICATOR	ACTDEP.7-8.2.1.	Using a variety of critical and creative thinking strategies such as brainstorming, sketching, 3-D modelling and experimenting to generate innovative design ideas
INDICATOR	ACTDEP.7-8.2.2.	Considering which ideas to further explore and investigating the benefits and drawbacks of ideas, for example using digital polling to capture the views of different groups in the community
INDICATOR	ACTDEP.7-8.2.3.	Identifying factors that may hinder or enhance project development, for example intercultural understanding
INDICATOR	ACTDEP.7-8.2.4.	Developing models, prototypes or samples using a range of materials, tools and equipment to test the functionality of ideas
INDICATOR	ACTDEP.7-8.2.5.	Producing annotated concept sketches and drawings, using: technical terms, scale, symbols, pictorial and aerial views to draw environments; production drawings, orthogonal drawings; patterns and templates to explain design ideas
INDICATOR	ACTDEP.7-8.2.6.	Documenting and communicating the generation and development of design ideas for an intended audience, for example developing a digital portfolio with images and text which clearly communicates each step of a design process

STRAND / DOMAIN		**Digital Technologies**
OUTCOME / INDICATOR	**ACTDIP.7-8.**	**Digital Technologies Processes and Production Skills**
INDICATOR	**ACTDIP.7-8.7.**	**Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors (ACTDIP029)**
INDICATOR	ACTDIP.7-8.7.2.	checking the accuracy of an algorithm before it is implemented, for example desk checking it with test data to see if the instructions produce the expected results
INDICATOR	ACTDIP.7-8.7.4.	using structured English to express algorithmic instructions, for example using conventional statements such as ‘while’ and ‘endwhile’ in a ‘while loop’ when describing interactive instruction

STRAND / DOMAIN		**Digital Technologies**

OUTCOME / INDICATOR	**ACTDIP.7-8.**	**Digital Technologies Processes and Production Skills**
INDICATOR	**ACTDIP.7-8.8.**	**Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language (ACTDIP030)**
INDICATOR	ACTDIP.7-8.8.1.	developing and modifying digital solutions by implementing instructions contained in algorithms through programs
INDICATOR	ACTDIP.7-8.8.3.	programming a robot to recognise particular objects and to treat them differently, for example choose objects based on colour
STRAND / DOMAIN		**Digital Technologies**
OUTCOME / INDICATOR	**ACTDIP.7-8.**	**Digital Technologies Processes and Production Skills**
INDICATOR	**ACTDIP.7-8.9.**	**Evaluate how student solutions and existing information systems meet needs, are innovative, and take account of future risks and sustainability (ACTDIP031)**
INDICATOR	ACTDIP.7-8.9.1.	comparing student solutions with existing solutions that solve similar problems, for example identifying differences in the user interface of two adventure games and explaining how these differences affect the usability or appeal of the game
INDICATOR	ACTDIP.7-8.9.2.	judging the quality of a student solution based on specific criteria such as meeting an economic need or contributing to social sustainability

Ohio Learning Standards

Mathematics

Grade **7** - Adopted: **2017**

DOMAIN / ACADEMIC CONTENT STANDARD	**OH.MP.**	**Standards for Mathematical Practice**
STANDARD / BENCHMARK	MP.1.	Make sense of problems and persevere in solving them.
STANDARD / BENCHMARK	MP.2.	Reason abstractly and quantitatively.
STANDARD / BENCHMARK	MP.3.	Construct viable arguments and critique the reasoning of others.
STANDARD / BENCHMARK	MP.4.	Model with mathematics.
STANDARD / BENCHMARK	MP.6.	Attend to precision.
STANDARD / BENCHMARK	MP.7.	Look for and make use of structure.

Ohio Learning Standards

Mathematics

Grade **8** - Adopted: **2017**

DOMAIN / ACADEMIC CONTENT STANDARD	OH.MP.	Standards for Mathematical Practice
STANDARD / BENCHMARK	MP.1.	Make sense of problems and persevere in solving them.
STANDARD / BENCHMARK	MP.2.	Reason abstractly and quantitatively.
STANDARD / BENCHMARK	MP.3.	Construct viable arguments and critique the reasoning of others.
STANDARD / BENCHMARK	MP.4.	Model with mathematics.
STANDARD / BENCHMARK	MP.6.	Attend to precision.
STANDARD / BENCHMARK	MP.7.	Look for and make use of structure.

Ohio Learning Standards

Science

Grade **7** - Adopted: **2018**

DOMAIN / ACADEMIC CONTENT STANDARD		PHYSICAL SCIENCE (PS)
STANDARD / BENCHMARK		**Topic: Cycles of Mass and Energy - This topic focuses on the empirical evidence for the arrangements of atoms on the Periodic Table of Elements, conservation of mass and energy, transformation and transfer of energy.**
BENCHMARK / GRADE LEVEL INDICATOR	**7.PS.4:**	**Energy can be transferred through a variety of ways.**
PROFICIENCY LEVEL		Mechanical energy can be transferred when objects push or pull on each other over a distance.
PROFICIENCY LEVEL		An electrical circuit transfers energy from a source to a device.

Ohio Learning Standards

Technology Education

Grade **7** - Adopted: **2017**

DOMAIN / ACADEMIC CONTENT STANDARD		Ohio Learning Standards in Technology
STANDARD / BENCHMARK		**Society and Technology: The interconnectedness of technology, self, society and the natural world, specifically addressing the ethical, legal, political and global impact of technology.**
BENCHMARK / GRADE LEVEL INDICATOR	**Topic 2:**	**Analyze the impact of communication and collaboration in both digital and physical environments.**

PROFICIENCY LEVEL	6-8.ST.2.b.	Explain the positive and negative impact the use of technology can have on personal, professional and community relationships.
DOMAIN / ACADEMIC CONTENT STANDARD		**Ohio Learning Standards in Technology**
STANDARD / BENCHMARK		**Society and Technology: The interconnectedness of technology, self, society and the natural world, specifically addressing the ethical, legal, political and global impact of technology.**
BENCHMARK / GRADE LEVEL INDICATOR	**Topic 3:**	**Explain how technology, society, and the individual impact one another.**
PROFICIENCY LEVEL	6-8.ST.3.d.	Describe the impact of an individual's wants, values and interests on the development of new technologies.
DOMAIN / ACADEMIC CONTENT STANDARD		**Ohio Learning Standards in Technology**
STANDARD / BENCHMARK		**Design and Technology: Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.**
BENCHMARK / GRADE LEVEL INDICATOR	**Topic 1:**	**Define and describe technology, including its core concepts of systems, resources, requirements, processes, controls, optimization and trade-offs.**
PROFICIENCY LEVEL	6-8.DT.1.c.	Define and categorize the requirements of a design as either criteria or constraints.
PROFICIENCY LEVEL	6-8.DT.1.f.	Give examples of how trade-offs must occur when optimizing a design in order to maintain design requirements.
DOMAIN / ACADEMIC CONTENT STANDARD		**Ohio Learning Standards in Technology**
STANDARD / BENCHMARK		**Design and Technology: Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.**
BENCHMARK / GRADE LEVEL INDICATOR	**Topic 2:**	**Identify a problem and use an engineering design process to solve the problem.**
PROFICIENCY LEVEL	6-8.DT.2.a.	Apply a complete design process to solve an identified individual or community problem: research, develop, test, evaluate and present several possible solutions, and redesign to improve the solution.
PROFICIENCY LEVEL	6-8.DT.2.d.	Consider multiple factors, including criteria and constraints, (e.g. research, cost, time, materials, feedback, safety, etc.) to justify decisions when developing products and systems to solve problems.
PROFICIENCY LEVEL	6-8.DT.2.e.	Identify and explain why effective designs develop from non-linear, flexible application of the design process.
DOMAIN / ACADEMIC CONTENT STANDARD		**Ohio Learning Standards in Technology**
STANDARD / BENCHMARK		**Design and Technology: Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.**

BENCHMARK / GRADE LEVEL INDICATOR	**Topic 3:**	**Demonstrate that solutions to complex problems require collaboration, interdisciplinary understanding, and systems thinking.**
PROFICIENCY LEVEL	6-8.DT.3.a.	Collaborate to solve a problem as an interdisciplinary team modeling different roles and functions.

Grade **7** - Adopted: **2022**

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 7**
STANDARD / BENCHMARK		**COMPUTING SYSTEMS**
BENCHMARK / GRADE LEVEL INDICATOR		**Troubleshooting**
PROFICIENCY LEVEL	CS.T.7.a.	Use a systematic process to identify and evaluate the source of a routine computing problem. Select the best solution to solve the computing problem and communicate the solution to others.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 7**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Algorithms**
PROFICIENCY LEVEL	ATP.A.7.a.	Select and modify pseudocode for a multi-step process to solve a problem.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 7**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Variables and Data Representation**
PROFICIENCY LEVEL	ATP.VDR.7.a.	Use test cases to trace variable values to determine the result.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 7**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Control Structures**
PROFICIENCY LEVEL	ATP.CS.7.a.	Use and apply decisions and loops in a program to solve a problem.

DOMAIN / ACADEMIC CONTENT STANDARD		Computer Science, Grade 7
STANDARD / BENCHMARK		ALGORITHMIC THINKING AND PROGRAMMING
BENCHMARK / GRADE LEVEL INDICATOR		Program Development
PROFICIENCY LEVEL	ATP.PD.7.a.	Write code that utilizes algorithms, variables and control structures to solve problems or as a creative expression.

DOMAIN / ACADEMIC CONTENT STANDARD		Computer Science, Grade 7
STANDARD / BENCHMARK		ARTIFICIAL INTELLIGENCE
BENCHMARK / GRADE LEVEL INDICATOR		Representation & Reasoning
PROFICIENCY LEVEL	AI.RR.7.a.	Compare several algorithms that could be used to solve a specific type of reasoning problem.

DOMAIN / ACADEMIC CONTENT STANDARD		Computer Science, Grade 7
STANDARD / BENCHMARK		ARTIFICIAL INTELLIGENCE
BENCHMARK / GRADE LEVEL INDICATOR		Natural Interactions
PROFICIENCY LEVEL	AI.NI.7.a.	Curate a dataset to train a language-processing algorithm to create a program that incorporates voice commands.

Ohio Learning Standards
Technology Education
Grade **8** - Adopted: **2017**

DOMAIN / ACADEMIC CONTENT STANDARD		Ohio Learning Standards in Technology
STANDARD / BENCHMARK		Society and Technology: The interconnectedness of technology, self, society and the natural world, specifically addressing the ethical, legal, political and global impact of technology.
BENCHMARK / GRADE LEVEL INDICATOR	Topic 2:	Analyze the impact of communication and collaboration in both digital and physical environments.
PROFICIENCY LEVEL	6-8.ST.2.b.	Explain the positive and negative impact the use of technology can have on personal, professional and community relationships.

DOMAIN / ACADEMIC CONTENT STANDARD		Ohio Learning Standards in Technology

STANDARD / BENCHMARK		**Society and Technology: The interconnectedness of technology, self, society and the natural world, specifically addressing the ethical, legal, political and global impact of technology.**
BENCHMARK / GRADE LEVEL INDICATOR	**Topic 3:**	**Explain how technology, society, and the individual impact one another.**
PROFICIENCY LEVEL	6-8.ST.3.d.	Describe the impact of an individual's wants, values and interests on the development of new technologies.

DOMAIN / ACADEMIC CONTENT STANDARD		**Ohio Learning Standards in Technology**
STANDARD / BENCHMARK		**Design and Technology: Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.**
BENCHMARK / GRADE LEVEL INDICATOR	**Topic 1:**	**Define and describe technology, including its core concepts of systems, resources, requirements, processes, controls, optimization and trade-offs.**
PROFICIENCY LEVEL	6-8.DT.1.c.	Define and categorize the requirements of a design as either criteria or constraints.
PROFICIENCY LEVEL	6-8.DT.1.f.	Give examples of how trade-offs must occur when optimizing a design in order to maintain design requirements.

DOMAIN / ACADEMIC CONTENT STANDARD		**Ohio Learning Standards in Technology**
STANDARD / BENCHMARK		**Design and Technology: Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.**
BENCHMARK / GRADE LEVEL INDICATOR	**Topic 2:**	**Identify a problem and use an engineering design process to solve the problem.**
PROFICIENCY LEVEL	6-8.DT.2.a.	Apply a complete design process to solve an identified individual or community problem: research, develop, test, evaluate and present several possible solutions, and redesign to improve the solution.
PROFICIENCY LEVEL	6-8.DT.2.d.	Consider multiple factors, including criteria and constraints, (e.g. research, cost, time, materials, feedback, safety, etc.) to justify decisions when developing products and systems to solve problems.
PROFICIENCY LEVEL	6-8.DT.2.e.	Identify and explain why effective designs develop from non-linear, flexible application of the design process.

DOMAIN / ACADEMIC CONTENT STANDARD		**Ohio Learning Standards in Technology**
STANDARD / BENCHMARK		**Design and Technology: Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.**
BENCHMARK / GRADE LEVEL INDICATOR	**Topic 3:**	**Demonstrate that solutions to complex problems require collaboration, interdisciplinary understanding, and systems thinking.**
PROFICIENCY LEVEL	6-8.DT.3.a.	Collaborate to solve a problem as an interdisciplinary team modeling different roles and functions.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 8**
STANDARD / BENCHMARK		**COMPUTING SYSTEMS**
BENCHMARK / GRADE LEVEL INDICATOR		**Troubleshooting**
PROFICIENCY LEVEL	CS.T.8.a.	Use a systematic process to identify and evaluate the source of a routine computing problem. Select the best solution to solve the computing problem and communicate the solution to others.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 8**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Algorithms**
PROFICIENCY LEVEL	ATP.A.8.a.	Create multiple pseudocode to solve a multi-step process and justify the most efficient solution.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 8**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Variables and Data Representation**
PROFICIENCY LEVEL	ATP.VDR.8.a.	Analyze test cases and determine the range of valid solutions.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 8**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Control Structures**
PROFICIENCY LEVEL	ATP.CS.8.a.	Use and apply decisions and loops in a program to solve a problem.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 8**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**

BENCHMARK / GRADE LEVEL INDICATOR		**Modularity**
PROFICIENCY LEVEL	ATP.M.8.a.	Decompose problems and subproblems into parts to facilitate the design, implementation and review of complex programs.
DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 8**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Program Development**
PROFICIENCY LEVEL	ATP.PD.8.a.	Write code that utilizes algorithms, variables and control structures to solve problems or as a creative expression.
DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 8**
STANDARD / BENCHMARK		**ARTIFICIAL INTELLIGENCE**
BENCHMARK / GRADE LEVEL INDICATOR		**Representation & Reasoning**
PROFICIENCY LEVEL	AI.RR.8.a.	Model the process of solving a graph-search problem using breadth-first search to draw a search tree.
DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 8**
STANDARD / BENCHMARK		**ARTIFICIAL INTELLIGENCE**
BENCHMARK / GRADE LEVEL INDICATOR		**Natural Interactions**
PROFICIENCY LEVEL	AI.NI.8.a.	Create a program, individually and collaboratively, that implements a language processing algorithm to create a functional chatbot.
DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 8**
STANDARD / BENCHMARK		**ARTIFICIAL INTELLIGENCE**
BENCHMARK / GRADE LEVEL INDICATOR		**Societal Impacts**
PROFICIENCY LEVEL	AI.SI.8.b.	Identify bias potential in the design of artificial intelligence systems and describe how to utilize inclusive AI design to prevent algorithmic bias.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 8**
STANDARD / BENCHMARK		**IMPACTS OF COMPUTING**
BENCHMARK / GRADE LEVEL INDICATOR		**Culture**
PROFICIENCY LEVEL	IC.Cu.8.d.	Explain how computing impacts innovation in other fields.

Oklahoma Academic Standards

Mathematics

Grade **7** - Adopted: **2022**

CONTENT STANDARD / COURSE		**Mathematical Actions and Processes**
STRAND / STANDARD		Develop a Deep and Flexible Conceptual Understanding
STRAND / STANDARD		Develop Accurate and Appropriate Procedural Fluency
STRAND / STANDARD		Develop Strategies for Problem Solving
STRAND / STANDARD		Develop Mathematical Reasoning
STRAND / STANDARD		Develop a Productive Mathematical Disposition
STRAND / STANDARD		Develop the Ability to Make Conjectures, Model, and Generalize
STRAND / STANDARD		Develop the Ability to Communicate Mathematically

CONTENT STANDARD / COURSE	**7**	**Seventh Grade (7)**
STRAND / STANDARD	**7.A.**	**Algebraic Reasoning & Algebra (A)**
OBJECTIVE	**7.A.4.**	**Use order of operations and properties of operations to generate and evaluate equivalent numerical and algebraic expressions.**
SKILL / CONCEPT	7.A.4.1.	Use properties of operations (associative, commutative, and distributive) to generate equivalent numerical and algebraic expressions containing rational numbers, grouping symbols and whole number exponents.

Oklahoma Academic Standards

Mathematics

Grade **8** - Adopted: **2022**

CONTENT STANDARD / COURSE		Mathematical Actions and Processes
STRAND / STANDARD		Develop a Deep and Flexible Conceptual Understanding
STRAND / STANDARD		Develop Accurate and Appropriate Procedural Fluency
STRAND / STANDARD		Develop Strategies for Problem Solving
STRAND / STANDARD		Develop Mathematical Reasoning
STRAND / STANDARD		Develop a Productive Mathematical Disposition
STRAND / STANDARD		Develop the Ability to Make Conjectures, Model, and Generalize
STRAND / STANDARD		Develop the Ability to Communicate Mathematically

CONTENT STANDARD / COURSE	A1.	Algebra 1 (A1)
STRAND / STANDARD	**A1.A.**	**Algebraic Reasoning & Algebra (A)**
OBJECTIVE	**A1.A.3.**	**Create and evaluate equivalent algebraic expressions and equations using algebraic properties.**
SKILL / CONCEPT	A1.A.3.2.	Simplify polynomial expressions by adding, subtracting, or multiplying.

CONTENT STANDARD / COURSE	A2.	Algebra 2 (A2)
STRAND / STANDARD	**A2.A.**	**Algebraic Reasoning & Algebra (A)**
OBJECTIVE	**A2.A.2.**	**Generate and evaluate equivalent algebraic expressions and equations using various strategies.**
SKILL / CONCEPT	A2.A.2.2.	Add, subtract, multiply, divide, and simplify polynomial expressions.

Oklahoma Academic Standards

Science

Grade **7** - Adopted: **2020**

CONTENT STANDARD / COURSE		Oklahoma Academic Standards for Science
STRAND / STANDARD		**Earth and Human Activity (ESS3)**

OBJECTIVE	7.ESS3.1	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
OBJECTIVE	7.ESS3.3	Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.
OBJECTIVE	7.ESS3.4	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
OBJECTIVE	7.ESS3.5	Obtain, evaluate, and communicate evidence of the factors that have caused changes in global temperatures over the past century.

Oklahoma Academic Standards

Technology Education

Grade **7** - Adopted: **2023**

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD		**Computer Science Practices**
OBJECTIVE		**Creating Computational Artifacts**
SKILL / CONCEPT		Develop computational artifacts to create prototypes and solve computational problems. Students create artifacts that are personally relevant or beneficial to the community and beyond. Computational artifacts can be created by combining and modifying existing artifacts or by developing new artifacts. Examples of computational artifacts include programs, simulations, visualizations, digital animations, robotic systems, and apps.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD		**Computer Science Practices**
OBJECTIVE		**Developing and Using Abstractions**
SKILL / CONCEPT		Identify patterns and extract common features from specific examples to create generalizations. Students will manage complexity by using generalized solutions and parts of solutions designed for broad reuse to simplify the development process.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD		**Computer Science Practices**
OBJECTIVE		**Developing a Productive Computing Environment**
SKILL / CONCEPT		Understand the contexts in which people operate and consider the needs of different users during the design process. Students will address the needs of different end users to produce artifacts with broad accessibility and usability and to meet the needs of all potential end users (including themselves).

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD		**Computer Science Practices**
OBJECTIVE		**Recognizing and Defining Computational Problems**

SKILL / CONCEPT		Recognize appropriate and worthwhile opportunities to apply computation. Students will work to solve a problem by defining the problem, breaking it down into parts, and evaluating each part to determine whether a computational solution is appropriate.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD	**7**	**Seventh Grade (7)**
OBJECTIVE	**7.CS.**	**Computing Systems (CS)**
SKILL / CONCEPT	**7.CS.T.**	**Troubleshooting (T)**
SKILL	7.CS.T.01.	Identify and resolve complex software and hardware problems with computing devices and their components utilizing strategies such as developing and analyzing flow diagrams.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD	**7**	**Seventh Grade (7)**
OBJECTIVE	**7.AP.**	**Algorithms & Programming (AP)**
SKILL / CONCEPT	**7.AP.A.**	**Algorithms (A)**
SKILL	7.AP.A.01.	Select and modify an existing algorithm in natural language or pseudocode to solve complex problems.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD	**7**	**Seventh Grade (7)**
OBJECTIVE	**7.AP.**	**Algorithms & Programming (AP)**
SKILL / CONCEPT	**7.AP.PD.**	**Program Development (PD)**
SKILL	7.AP.PD.01.	Seek and incorporate feedback from team members and users to refine a solution to a problem.
SKILL	7.AP.PD.04.	Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.

Grade **7** - Adopted: **2019**

CONTENT STANDARD / COURSE		**ISTE for Students 2016 (ISTE-S)**
STRAND / STANDARD	**ISTE-S.3.**	**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.**
OBJECTIVE	ISTE-S.3.d.	Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

CONTENT STANDARD / COURSE		ISTE for Students 2016 (ISTE-S)
STRAND / STANDARD	**ISTE-S.4.**	**Innovative Designer: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**
OBJECTIVE	ISTE-S.4.a.	Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
OBJECTIVE	ISTE-S.4.b.	Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

CONTENT STANDARD / COURSE		ISTE for Students 2016 (ISTE-S)
STRAND / STANDARD	**ISTE-S.5.**	**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.**
OBJECTIVE	ISTE-S.5.a.	Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
OBJECTIVE	ISTE-S.5.b.	Students 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.
OBJECTIVE	ISTE-S.5.d.	Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Oklahoma Academic Standards

Technology Education

Grade **8** - Adopted: **2023**

CONTENT STANDARD / COURSE		Oklahoma Academic Standards - Computer Science
STRAND / STANDARD		**Computer Science Practices**
OBJECTIVE		**Creating Computational Artifacts**
SKILL / CONCEPT		Develop computational artifacts to create prototypes and solve computational problems. Students create artifacts that are personally relevant or beneficial to the community and beyond. Computational artifacts can be created by combining and modifying existing artifacts or by developing new artifacts. Examples of computational artifacts include programs, simulations, visualizations, digital animations, robotic systems, and apps.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards - Computer Science
STRAND / STANDARD		**Computer Science Practices**
OBJECTIVE		**Developing and Using Abstractions**
SKILL / CONCEPT		Identify patterns and extract common features from specific examples to create generalizations. Students will manage complexity by using generalized solutions and parts of solutions designed for broad reuse to simplify the development process.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD		**Computer Science Practices**
OBJECTIVE		**Developing a Productive Computing Environment**
SKILL / CONCEPT		Understand the contexts in which people operate and consider the needs of different users during the design process. Students will address the needs of different end users to produce artifacts with broad accessibility and usability and to meet the needs of all potential end users (including themselves).

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD		**Computer Science Practices**
OBJECTIVE		**Recognizing and Defining Computational Problems**
SKILL / CONCEPT		Recognize appropriate and worthwhile opportunities to apply computation. Students will work to solve a problem by defining the problem, breaking it down into parts, and evaluating each part to determine whether a computational solution is appropriate.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD	**8**	**Eighth Grade (8)**
OBJECTIVE	**8.CS.**	**Computing Systems (CS)**
SKILL / CONCEPT	**8.CS.T.**	**Troubleshooting (T)**
SKILL	8.CS.T.01.	Systematically identify, resolve, and document complex software and hardware problems with computing devices and their components.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD	**8**	**Eighth Grade (8)**
OBJECTIVE	**8.AP.**	**Algorithms & Programming (AP)**
SKILL / CONCEPT	**8.AP.A.**	**Algorithms (A)**
SKILL	8.AP.A.01.	Design algorithms in natural language, flow and control diagrams, comments within code, and/or pseudocode to solve complex problems.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD	**8**	**Eighth Grade (8)**
OBJECTIVE	**8.AP.**	**Algorithms & Programming (AP)**
SKILL / CONCEPT	**8.AP.PD.**	**Program Development (PD)**

SKILL	8.AP.PD.01.	Seek and incorporate feedback from team members and users to refine a solution to a problem that meets the needs of different users.
SKILL	8.AP.PD.04.	Model effective communication between participants and demonstrate successful collaboration when developing computational artifacts.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD	**8**	**Eighth Grade (8)**
OBJECTIVE	**8.IC.**	**Impacts of Computing (IC)**
SKILL / CONCEPT	**8.IC.CU.**	**Culture (CU)**
SKILL	8.IC.CU.01.	Explore careers related to the field of computer science, and explain how computing impacts innovation in various career fields.

Grade **8** - Adopted: **2019**

CONTENT STANDARD / COURSE		**ISTE for Students 2016 (ISTE-S)**
STRAND / STANDARD	**ISTE-S.3.**	**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.**
OBJECTIVE	ISTE-S.3.d.	Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

CONTENT STANDARD / COURSE		**ISTE for Students 2016 (ISTE-S)**
STRAND / STANDARD	**ISTE-S.4.**	**Innovative Designer: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**
OBJECTIVE	ISTE-S.4.a.	Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
OBJECTIVE	ISTE-S.4.b.	Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

CONTENT STANDARD / COURSE		**ISTE for Students 2016 (ISTE-S)**
STRAND / STANDARD	**ISTE-S.5.**	**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.**
OBJECTIVE	ISTE-S.5.a.	Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
OBJECTIVE	ISTE-S.5.b.	Students 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.
OBJECTIVE	ISTE-S.5.d.	Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Oregon Academic Content Standards
Mathematics
Grade **7** - Adopted: **2021**

STANDARD / CONTENT AREA		Mathematical Practice Standards
CONTENT STANDARD / PROFICIENCY	1	Make sense of problems and persevere in solving them.
CONTENT STANDARD / PROFICIENCY	2	Reason abstractly and quantitatively.
CONTENT STANDARD / PROFICIENCY	3	Construct viable arguments and critique the reasoning of others.
CONTENT STANDARD / PROFICIENCY	4	Model with mathematics.
CONTENT STANDARD / PROFICIENCY	6	Attend to precision.
CONTENT STANDARD / PROFICIENCY	7	Look for and make use of structure.

STANDARD / CONTENT AREA		Grade 7 Standards
CONTENT STANDARD / PROFICIENCY	**7.AEE.**	**Algebraic Reasoning: Expressions and Equations (7.AEE)**
BENCHMARK / STRAND	**7.AEE.A.**	**Use properties of operations to generate equivalent expressions.**
EXPECTATION / BENCHMARK	7.AEE.A.1.	Identify and write equivalent expressions with rational numbers by applying associative, commutative, and distributive properties.

Oregon Academic Content Standards
Mathematics
Grade **8** - Adopted: **2021**

STANDARD / CONTENT AREA		Mathematical Practice Standards
CONTENT STANDARD / PROFICIENCY	1	Make sense of problems and persevere in solving them.

CONTENT STANDARD / PROFICIENCY	2	Reason abstractly and quantitatively.
CONTENT STANDARD / PROFICIENCY	3	Construct viable arguments and critique the reasoning of others.
CONTENT STANDARD / PROFICIENCY	4	Model with mathematics.
CONTENT STANDARD / PROFICIENCY	6	Attend to precision.
CONTENT STANDARD / PROFICIENCY	7	Look for and make use of structure.

Oregon Academic Content Standards

Science

Grade **7** - Adopted: **2022**

STANDARD / CONTENT AREA	**OR.MS-ESS3.**	**Earth and Human Activity**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	MS-ESS3-1.	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
STANDARD / CONTENT AREA	**OR.MS-ETS1.**	**Engineering Design**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
BENCHMARK / STRAND	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
BENCHMARK / STRAND	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
STANDARD / CONTENT AREA	**OR.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Key Ideas and Details**

BENCHMARK / STRAND	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
BENCHMARK / STRAND	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
STANDARD / CONTENT AREA	**OR.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Craft and Structure**
BENCHMARK / STRAND	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
BENCHMARK / STRAND	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
STANDARD / CONTENT AREA	**OR.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Integration of Knowledge and Ideas**
BENCHMARK / STRAND	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
STANDARD / CONTENT AREA	**OR.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Range of Reading and Level of Text Complexity**
BENCHMARK / STRAND	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
STANDARD / CONTENT AREA	**OR.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Text Types and Purposes**
BENCHMARK / STRAND	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
EXPECTATION / BENCHMARK	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.
STANDARD / CONTENT AREA	**OR.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Production and Distribution of Writing**

BENCHMARK / STRAND	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
BENCHMARK / STRAND	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Oregon Academic Content Standards

Science

Grade **8** - Adopted: **2022**

STANDARD / CONTENT AREA	**OR.MS-ESS3.**	**Earth and Human Activity**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
STANDARD / CONTENT AREA	**OR.MS-PS4.**	**Waves and their Applications in Technologies for Information Transfer**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	MS-PS4-3.	Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.
STANDARD / CONTENT AREA	**OR.MS-ETS1.**	**Engineering Design**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
BENCHMARK / STRAND	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
BENCHMARK / STRAND	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
STANDARD / CONTENT AREA	**OR.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Key Ideas and Details**
BENCHMARK / STRAND	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

BENCHMARK / STRAND	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
STANDARD / CONTENT AREA	**OR.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Craft and Structure**
BENCHMARK / STRAND	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
BENCHMARK / STRAND	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
STANDARD / CONTENT AREA	**OR.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Integration of Knowledge and Ideas**
BENCHMARK / STRAND	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
STANDARD / CONTENT AREA	**OR.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Range of Reading and Level of Text Complexity**
BENCHMARK / STRAND	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
STANDARD / CONTENT AREA	**OR.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Text Types and Purposes**
BENCHMARK / STRAND	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
EXPECTATION / BENCHMARK	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.
STANDARD / CONTENT AREA	**OR.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Production and Distribution of Writing**
BENCHMARK / STRAND	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

BENCHMARK / STRAND	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.