Main Criteria: Forward Education

Secondary Criteria: Montana Content Standards, 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, Ohio Learning Standards, Oklahoma Academic Standards, Oregon Academic Content Standards, Pennsylvania Core and Academic Standards

Subjects: Mathematics, Science, Technology Education

Grades: 7, 8, Key Stage 3

Forward Education

Wildfire detection with Autonomous Vehicles

Montana Content Standards

Mathematics

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

CONTENT STANDARD / DOMAIN	MT.CC.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.
BENCHMARK / STANDARD	MP.8.	Look for and express regularity in repeated reasoning.

CONTENT STANDARD / DOMAIN	MT.CC.7.EE.	Expressions and Equations
BENCHMARK / STANDARD		**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**
GRADE LEVEL EXPECTATION / BENCHMARK	**7.EE.4.**	**Use variables to represent quantities in a real-world or mathematical problem, including those represented in Montana American Indian cultural contexts, and construct simple equations and inequalities to solve problems by reasoning about the quantities.**
EXPECTATION	7.EE.4.a.	Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

Montana Content Standards

Mathematics

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

CONTENT STANDARD / DOMAIN	**MT.CC.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.
BENCHMARK / STANDARD	MP.8.	Look for and express regularity in repeated reasoning.
CONTENT STANDARD / DOMAIN	**MT.CC.8.EE.**	**Expressions and Equations**
BENCHMARK / STANDARD		**Understand the connections between proportional relationships, lines, and linear equations.**
GRADE LEVEL EXPECTATION / BENCHMARK	8.EE.5.	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

Montana Content Standards

Science

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

CONTENT STANDARD / DOMAIN	**MT.6-8.PS.**	**PHYSICAL SCIENCE content standards for sixth through eighth grades are that each student will:**
BENCHMARK / STANDARD	6-8.PS.14.	Apply scientific principles to design, construct, and test a device that minimizes or maximizes thermal energy transfer
CONTENT STANDARD / DOMAIN	**MT.6-8.LS.**	**LIFE SCIENCE content standards for sixth through eighth grades are that each student will:**
BENCHMARK / STANDARD	6-8.LS.9.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services
CONTENT STANDARD / DOMAIN	**MT.6-8.ESS.**	**EARTH AND SPACE SCIENCE content standards for sixth through eighth grades are that students will:**

BENCHMARK / STANDARD	6-8.ESS.12.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century
BENCHMARK / STANDARD	6-8.ESS.13.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects
BENCHMARK / STANDARD	6-8.ESS.14.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

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

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Key Ideas and Details**
GRADE LEVEL EXPECTATION / BENCHMARK	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.
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Craft and Structure**
GRADE LEVEL EXPECTATION / BENCHMARK	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.
GRADE LEVEL EXPECTATION / BENCHMARK	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 / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Integration of Knowledge and Ideas**
GRADE LEVEL EXPECTATION / BENCHMARK	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 / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Range of Reading Level of Text Complexity**

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

CONTENT STANDARD / DOMAIN	**MT.WHST.6-8.**	**Writing Standards for Literacy in Science, and Technical Subjects**
BENCHMARK / STANDARD		**Production and Distribution of Writing**
GRADE LEVEL EXPECTATION / BENCHMARK	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
GRADE LEVEL EXPECTATION / BENCHMARK	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.

Montana Content Standards

Science

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

CONTENT STANDARD / DOMAIN	**MT.6-8.PS.**	**PHYSICAL SCIENCE content standards for sixth through eighth grades are that each student will:**
BENCHMARK / STANDARD	6-8.PS.14.	Apply scientific principles to design, construct, and test a device that minimizes or maximizes thermal energy transfer
CONTENT STANDARD / DOMAIN	**MT.6-8.LS.**	**LIFE SCIENCE content standards for sixth through eighth grades are that each student will:**
BENCHMARK / STANDARD	6-8.LS.9.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services
CONTENT STANDARD / DOMAIN	**MT.6-8.ESS.**	**EARTH AND SPACE SCIENCE content standards for sixth through eighth grades are that students will:**
BENCHMARK / STANDARD	6-8.ESS.12.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century
BENCHMARK / STANDARD	6-8.ESS.13.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects

BENCHMARK / STANDARD	6-8.ESS.14.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

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

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Key Ideas and Details**
GRADE LEVEL EXPECTATION / BENCHMARK	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.
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Craft and Structure**
GRADE LEVEL EXPECTATION / BENCHMARK	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.
GRADE LEVEL EXPECTATION / BENCHMARK	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 / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Integration of Knowledge and Ideas**
GRADE LEVEL EXPECTATION / BENCHMARK	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 / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Range of Reading Level of Text Complexity**
GRADE LEVEL EXPECTATION / BENCHMARK	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 / DOMAIN	**MT.WHST.6-8.**	**Writing Standards for Literacy in Science, and Technical Subjects**
BENCHMARK / STANDARD		**Text Types and Purposes**

GRADE LEVEL EXPECTATION / BENCHMARK	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
EXPECTATION	WHST.6-8.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.
CONTENT STANDARD / DOMAIN	**MT.WHST.6-8.**	**Writing Standards for Literacy in Science, and Technical Subjects**
BENCHMARK / STANDARD		**Production and Distribution of Writing**
GRADE LEVEL EXPECTATION / BENCHMARK	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
GRADE LEVEL EXPECTATION / BENCHMARK	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.

Montana Content Standards

Technology Education

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

CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(4)**	**The innovative designer content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(a)	select and use digital tools to support design processes, identify constraints and trade-offs and weigh risks;
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(b)	engage in design process to develop, test and revise prototypes or create innovative products; and
CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(5)**	**The computational thinker content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(5)(a)	investigate and practice solving problems by using data analysis, modeling or algorithmic thinking;
CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(6)**	**The creative communicator content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(6)(a)	select appropriate platforms and tools to create, share, and communicate work;

GRADE LEVEL EXPECTATION / BENCHMARK	(6)(b)	create original works or responsibly remix and repurpose other digital resources into new creative works; and

CONTENT STANDARD / DOMAIN		COMPUTER SCIENCE CONTENT STANDARDS FOR SIXTH THROUGH EIGHTH GRADE
BENCHMARK / STANDARD	**(1)**	**Computer science algorithms and programming standards for sixth through eighth grades are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(b)	create clearly named variables that represent different data types and perform operations on their values;
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(c)	develop programs that combine control structures, including nested loops and compound conditionals;
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(d)	decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs;
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(i)	distribute tasks and maintain a project timeline when collaboratively developing computational artifacts; and

CONTENT STANDARD / DOMAIN		COMPUTER SCIENCE CONTENT STANDARDS FOR SIXTH THROUGH EIGHTH GRADE
BENCHMARK / STANDARD	**(3)**	**Computer science data and analysis standards for sixth through eighth grades are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(3)(c)	refine computational models based on the data they have generated.

CONTENT STANDARD / DOMAIN		COMPUTER SCIENCE CONTENT STANDARDS FOR SIXTH THROUGH EIGHTH GRADE
BENCHMARK / STANDARD	**(4)**	**Computer science impacts of computing standards for sixth through eighth grades are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(c)	collaborate with other contributors when creating a computational artifact; and

Montana Content Standards

Technology Education

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

CONTENT STANDARD / DOMAIN		CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE
BENCHMARK / STANDARD	**(4)**	**The innovative designer content standards for sixth-eighth grade are that each student will:**

GRADE LEVEL EXPECTATION / BENCHMARK	(4)(a)	select and use digital tools to support design processes, identify constraints and trade-offs and weigh risks;
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(b)	engage in design process to develop, test and revise prototypes or create innovative products; and
CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(5)**	**The computational thinker content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(5)(a)	investigate and practice solving problems by using data analysis, modeling or algorithmic thinking;
CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(6)**	**The creative communicator content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(6)(a)	select appropriate platforms and tools to create, share, and communicate work;
GRADE LEVEL EXPECTATION / BENCHMARK	(6)(b)	create original works or responsibly remix and repurpose other digital resources into new creative works; and
CONTENT STANDARD / DOMAIN		**COMPUTER SCIENCE CONTENT STANDARDS FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(1)**	**Computer science algorithms and programming standards for sixth through eighth grades are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(b)	create clearly named variables that represent different data types and perform operations on their values;
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(c)	develop programs that combine control structures, including nested loops and compound conditionals;
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(d)	decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs;
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(i)	distribute tasks and maintain a project timeline when collaboratively developing computational artifacts; and
CONTENT STANDARD / DOMAIN		**COMPUTER SCIENCE CONTENT STANDARDS FOR SIXTH THROUGH EIGHTH GRADE**

BENCHMARK / STANDARD	**(3)**	**Computer science data and analysis standards for sixth through eighth grades are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(3)(c)	refine computational models based on the data they have generated.

CONTENT STANDARD / DOMAIN		**COMPUTER SCIENCE CONTENT STANDARDS FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(4)**	**Computer science impacts of computing standards for sixth through eighth grades are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(c)	collaborate with other contributors when creating a computational artifact; and

Nebraska Content Area Standards

Mathematics

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

CONTENT STANDARD		**Grade 8 Standards**
STRAND	**8.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	**8.A.2.**	**Applications: Students will solve authentic problems involving multi-step equations.**
STRAND	8.A.2.c.	Graph proportional relationships and interpret the rate of change.

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.B.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

CONTENT STANDARD	**NE.SC.7.8.**	**Matter and Energy in Organisms and Ecosystems**
STRAND	**SC.7.8.4.**	**Gather, analyze, and communicate evidence of the flow of energy and cycling of matter in organisms and ecosystems.**
INDICATOR	SC.7.8.4.E.	Construct an argument supported by evidence that changes to physical or biological components of an ecosystem affect populations.

CONTENT STANDARD	**NE.SC.7.14.**	**History of Earth**
STRAND	**SC.7.14.6.**	**Gather, analyze, and communicate evidence to explain Earth's history.**
INDICATOR	SC.7.14.6.A.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

INDICATOR	SC.7.14.6.C.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

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		**PRODUCTIVITY APPLICATIONS/TOOLS**
INDICATOR		**SPREADSHEETS STANDARDS**
STRAND		Demonstrate and understanding of recording, organizing, and graphing information.

CONTENT STANDARD		**NEBRASKA K-12 TECHNOLOGY Scope & Sequence**
STRAND		**COMPUTER SCIENCE/PROGRAMMING**
INDICATOR		**COMPUTATIONAL THINKING STANDARDS**
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).
STRAND		Create and modify animations, and present work to others.
STRAND		Write programs using text-based programming languages.

Nebraska Content Area Standards

Technology Education

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

CONTENT STANDARD		**NEBRASKA K-12 TECHNOLOGY Scope & Sequence**
STRAND		**PRODUCTIVITY APPLICATIONS/TOOLS**
INDICATOR		**SPREADSHEETS STANDARDS**

STRAND		Demonstrate and understanding of recording, organizing, and graphing information.
CONTENT STANDARD		**NEBRASKA K-12 TECHNOLOGY Scope & Sequence**
STRAND		**COMPUTER SCIENCE/PROGRAMMING**
INDICATOR		**COMPUTATIONAL THINKING STANDARDS**
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).
STRAND		Create and modify animations, and present work to others.
STRAND		Write programs using text-based programming languages.

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.
STRAND / INDICATOR	MP.7.8.	Look for and express regularity in repeated reasoning.
CONTENT STANDARD	**NV.CC.EE.7.**	**Expressions and Equations**

STRAND / INDICATOR		**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**
INDICATOR / GRADE LEVEL EXPECTATION	**EE.7.4.**	**Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.**
GRADE LEVEL EXPECTATION	EE.7.4(a)	Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

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.
STRAND / INDICATOR	MP.8.8.	Look for and express regularity in repeated reasoning.
CONTENT STANDARD	**NV.CC.EE.8.**	**Expressions and Equations**
STRAND / INDICATOR		**Understand the connections between proportional relationships, lines, and linear equations.**
INDICATOR / GRADE LEVEL EXPECTATION	EE.8.5.	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

Nevada Academic Content Standards

Science

Grade **7** - Adopted: **2014**

CONTENT STANDARD	**NV.MS-PS.**	**PHYSICAL SCIENCE**
STRAND / INDICATOR	**MS-PS3.**	**Energy**

INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	MS-PS3-3.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
CONTENT STANDARD	**NV.MS-LS.**	**LIFE SCIENCE**
STRAND / INDICATOR	**MS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
GRADE LEVEL EXPECTATION	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
CONTENT STANDARD	**NV.MS-ESS.**	**EARTH AND SPACE SCIENCE**
STRAND / INDICATOR	**MS-ESS2.**	**Earth's Systems**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
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-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
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-ESS3-5.	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-PS.**	**PHYSICAL SCIENCE**
STRAND / INDICATOR	**MS-PS3.**	**Energy**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	MS-PS3-3.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

CONTENT STANDARD	**NV.MS-LS.**	**LIFE SCIENCE**
STRAND / INDICATOR	**MS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
GRADE LEVEL EXPECTATION	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

CONTENT STANDARD	**NV.MS-ESS.**	**EARTH AND SPACE SCIENCE**
STRAND / INDICATOR	**MS-ESS2.**	**Earth's Systems**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

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-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
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-ESS3-5.	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	P1.3.	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.

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.
GRADE LEVEL EXPECTATION	P4.4.	Model phenomena and processes and simulate systems to understand and evaluate potential outcomes.

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		**Algorithms and Programming**
INDICATOR / GRADE LEVEL EXPECTATION	6-8.AP.V.2.	Create clearly named variables that represent different data types and perform operations on their values.
INDICATOR / GRADE LEVEL EXPECTATION	6-8.AP.C.1.	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.
INDICATOR / GRADE LEVEL EXPECTATION	6-8.AP.PD.1.	Design meaningful solutions for others, incorporating data from collaborative team members and the end user, to meet the end user's needs.
CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE**
STRAND / INDICATOR		**Data and Analysis**
INDICATOR / GRADE LEVEL EXPECTATION	6-8.DA.IM.1.	Refine computational models based on the reliability and validity of the data they generate.
CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY**
STRAND / INDICATOR		**Knowledge Constructor**
INDICATOR / GRADE LEVEL EXPECTATION	6-8.KC.D.1.	Explore real-world issues and problems through inquiry and analysis, develop ideas, actively create solutions for them, and evaluate and revise through the use of digital tools.
CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY**

STRAND / INDICATOR		**Innovative Designer**
INDICATOR / GRADE LEVEL EXPECTATION	6-8.ID.A.1.	Engage in a design process and employ it to inquire and analyze, generate ideas, create innovative products or solve authentic problems, and evaluate the process to revise if needed.
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.
CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY**
STRAND / INDICATOR		**Global Collaborator**
INDICATOR / GRADE LEVEL EXPECTATION	6-8.GC.D.1.	Select collaborative technologies and use them to work with others to investigate and develop solutions related to local and global issues.

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	P1.3.	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.

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.
GRADE LEVEL EXPECTATION	P4.4.	Model phenomena and processes and simulate systems to understand and evaluate potential outcomes.

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		**Algorithms and Programming**
INDICATOR / GRADE LEVEL EXPECTATION	6-8.AP.V.2.	Create clearly named variables that represent different data types and perform operations on their values.
INDICATOR / GRADE LEVEL EXPECTATION	6-8.AP.C.1.	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.
INDICATOR / GRADE LEVEL EXPECTATION	6-8.AP.PD.1.	Design meaningful solutions for others, incorporating data from collaborative team members and the end user, to meet the end user's needs.

CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE**
STRAND / INDICATOR		**Data and Analysis**

INDICATOR / GRADE LEVEL EXPECTATION	6-8.DA.IM.1.	Refine computational models based on the reliability and validity of the data they generate.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY
STRAND / INDICATOR		**Knowledge Constructor**
INDICATOR / GRADE LEVEL EXPECTATION	6-8.KC.D.1.	Explore real-world issues and problems through inquiry and analysis, develop ideas, actively create solutions for them, and evaluate and revise through the use of digital tools.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY
STRAND / INDICATOR		**Innovative Designer**
INDICATOR / GRADE LEVEL EXPECTATION	6-8.ID.A.1.	Engage in a design process and employ it to inquire and analyze, generate ideas, create innovative products or solve authentic problems, and evaluate the process to revise if needed.
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.

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY
STRAND / INDICATOR		**Global Collaborator**
INDICATOR / GRADE LEVEL EXPECTATION	6-8.GC.D.1.	Select collaborative technologies and use them to work with others to investigate and develop solutions related to local and global issues.

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.
STANDARD / GLE	MP.7.8.	Look for and express regularity in repeated reasoning.

STRAND / STANDARD	**NH.CC.EE.7.**	**Expressions and Equations**
STANDARD / GLE		**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**
GRADE LEVEL EXPECTATION	**EE.7.4.**	**Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.**
EXPECTATION	EE.7.4(a)	Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

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.
STANDARD / GLE	MP.8.8.	Look for and express regularity in repeated reasoning.

STRAND / STANDARD	**NH.CC.EE.8.**	**Expressions and Equations**
STANDARD / GLE		**Understand the connections between proportional relationships, lines, and linear equations.**

GRADE LEVEL EXPECTATION	EE.8.5.	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

New Hampshire College and Career Ready Standards

Science

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

STRAND / STANDARD	NGSS.MS-PS.	PHYSICAL SCIENCE
STANDARD / GLE	**MS-PS3.**	**Energy**
GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
EXPECTATION	MS-PS3-3.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

STRAND / STANDARD	NGSS.MS-LS.	LIFE SCIENCE
STANDARD / GLE	**MS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
EXPECTATION	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
EXPECTATION	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

STRAND / STANDARD	NGSS.MS-ESS.	EARTH AND SPACE SCIENCE
STANDARD / GLE	**MS-ESS2.**	**Earth's Systems**
GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
EXPECTATION	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

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-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
EXPECTATION	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

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

Science

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

STRAND / STANDARD	NGSS.MS-PS.	PHYSICAL SCIENCE
STANDARD / GLE	MS-PS3.	Energy
GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:
EXPECTATION	MS-PS3-3.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

STRAND / STANDARD	NGSS.MS-LS.	LIFE SCIENCE
STANDARD / GLE	MS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:
EXPECTATION	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
EXPECTATION	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

STRAND / STANDARD	NGSS.MS-ESS.	EARTH AND SPACE SCIENCE
STANDARD / GLE	MS-ESS2.	Earth's Systems
GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:

EXPECTATION	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
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-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
EXPECTATION	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
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: **2018**

STRAND / STANDARD		**Computer Science**
STANDARD / GLE		**Data & Analysis**
GRADE LEVEL EXPECTATION	2-DA-09.	Refine computational models based on the data they have generated.
STRAND / STANDARD		**Computer Science**
STANDARD / GLE		**Algorithms & Programming**

GRADE LEVEL EXPECTATION	2-AP-11.	Create clearly named variables that represent different data types and perform operations on their values.
GRADE LEVEL EXPECTATION	2-AP-12.	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.

New Hampshire College and Career Ready Standards

Technology Education

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

STRAND / STANDARD		**Computer Science**
STANDARD / GLE		**Data & Analysis**
GRADE LEVEL EXPECTATION	2-DA-09.	Refine computational models based on the data they have generated.

STRAND / STANDARD		**Computer Science**
STANDARD / GLE		**Algorithms & Programming**
GRADE LEVEL EXPECTATION	2-AP-11.	Create clearly named variables that represent different data types and perform operations on their values.
GRADE LEVEL EXPECTATION	2-AP-12.	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.

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.
STRAND	MP.8.	Look for and express regularity in repeated reasoning.

CONTENT AREA / STANDARD	**NJ.7.EE.**	**Expressions and Equations**

STRAND	**7.EE.B.**	**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**
CONTENT STATEMENT	**7.EE.B.4.**	**Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.**
CUMULATIVE PROGRESS INDICATOR	7.EE.B.4.a.	Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

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.
STRAND	MP.8.	Look for and express regularity in repeated reasoning.
CONTENT AREA / STANDARD	**NJ.8.EE.**	**Expressions and Equations**
STRAND	**8.EE.B.**	**Understand the connections between proportional relationships, lines, and linear equations.**
CONTENT STATEMENT	8.EE.B.5.	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

New Jersey Student Learning Standards

Science

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

CONTENT AREA / STANDARD	**MS-PS.**	**Physical Science**
STRAND	**MS-PS3:**	**Energy**
CONTENT STATEMENT	MS-PS3-3.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
CONTENT AREA / STANDARD	**MS-LS.**	**Life Science**

STRAND	**MS-LS2:**	**Ecosystems: Interactions, Energy, and Dynamics**
CONTENT STATEMENT	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
CONTENT STATEMENT	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
CONTENT AREA / STANDARD	**MS-ESS.**	**Earth and Space Science**
STRAND	**MS-ESS2:**	**Earth's Systems**
CONTENT STATEMENT	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
CONTENT AREA / STANDARD	**MS-ESS.**	**Earth and Space Science**
STRAND	**MS-ESS3:**	**Earth and Human Activity**
CONTENT STATEMENT	MS-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
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-ESS3-5.	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-PS.**	**Physical Science**
STRAND	**MS-PS3:**	**Energy**

CONTENT STATEMENT	MS-PS3-3.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
CONTENT AREA / STANDARD	**MS-LS.**	**Life Science**
STRAND	**MS-LS2:**	**Ecosystems: Interactions, Energy, and Dynamics**
CONTENT STATEMENT	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
CONTENT STATEMENT	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
CONTENT AREA / STANDARD	**MS-ESS.**	**Earth and Space Science**
STRAND	**MS-ESS2:**	**Earth's Systems**
CONTENT STATEMENT	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
CONTENT AREA / STANDARD	**MS-ESS.**	**Earth and Space Science**
STRAND	**MS-ESS3:**	**Earth and Human Activity**
CONTENT STATEMENT	MS-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
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-ESS3-5.	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.

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		Identify complex, interdisciplinary, real-world problems that can be solved computationally.
CUMULATIVE PROGRESS INDICATOR		Decompose complex real-world problems into manageable sub-problems that could integrate existing solutions or procedures.

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		Create modules and develop points of interaction that can apply to multiple situations and reduce complexity.
CUMULATIVE PROGRESS INDICATOR		Model phenomena and processes and simulate systems to understand and evaluate potential outcomes.

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		**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.
CUMULATIVE PROGRESS INDICATOR	8.1.8.DA.6:	Analyze climate change computational models and propose refinements.
CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Algorithms & Programming**
CONTENT STATEMENT		**Programmers create variables to store data values of different types and perform appropriate operations on their values.**
CUMULATIVE PROGRESS INDICATOR	8.1.8.AP.2:	Create clearly named variables that represent different data types and perform operations on their values.
CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**

STRAND		**Algorithms & Programming**
CONTENT STATEMENT		**Control structures are selected and combined in programs to solve more complex problems.**
CUMULATIVE PROGRESS INDICATOR	8.1.8.AP.3:	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.
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.7:	Design programs, incorporating existing code, media, and libraries, and give attribution.
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.3:	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).
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.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		**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.4:	Compare the environmental effects of two alternative technologies devised to address climate change issues and use data to justify which choice is best.

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		Identify complex, interdisciplinary, real-world problems that can be solved computationally.
CUMULATIVE PROGRESS INDICATOR		Decompose complex real-world problems into manageable sub-problems that could integrate existing solutions or procedures.

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		Create modules and develop points of interaction that can apply to multiple situations and reduce complexity.
CUMULATIVE PROGRESS INDICATOR		Model phenomena and processes and simulate systems to understand and evaluate potential outcomes.
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		**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.
CUMULATIVE PROGRESS INDICATOR	8.1.8.DA.6:	Analyze climate change computational models and propose refinements.

CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Algorithms & Programming**
CONTENT STATEMENT		**Programmers create variables to store data values of different types and perform appropriate operations on their values.**
CUMULATIVE PROGRESS INDICATOR	8.1.8.AP.2:	Create clearly named variables that represent different data types and perform operations on their values.

CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Algorithms & Programming**
CONTENT STATEMENT		**Control structures are selected and combined in programs to solve more complex problems.**
CUMULATIVE PROGRESS INDICATOR	8.1.8.AP.3:	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.

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.7:	Design programs, incorporating existing code, media, and libraries, and give attribution.
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.3:	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).
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.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		**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.4:	Compare the environmental effects of two alternative technologies devised to address climate change issues and use data to justify which choice is best.

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.
BENCHMARK / STANDARD	MP.8.	Look for and express regularity in repeated reasoning.

STRAND / CONTENT STANDARD	**NM.7.EE.**	**Expressions and Equations**
BENCHMARK / STANDARD		**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**7.EE.4.**	**Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.**
PERFORMANCE STANDARD / INDICATOR	7.EE.4(a)	Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

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.
BENCHMARK / STANDARD	MP.8.	Look for and express regularity in repeated reasoning.
STRAND / CONTENT STANDARD	**NM.8.EE.**	**Expressions and Equations**
BENCHMARK / STANDARD		**Understand the connections between proportional relationships, lines, and linear equations.**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	8.EE.5.	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

New Mexico Content Standards

Science

STRAND / CONTENT STANDARD	**NGSS.MS-PS.**	**PHYSICAL SCIENCE**
BENCHMARK / STANDARD	**MS-PS3.**	**Energy**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	MS-PS3-3.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

STRAND / CONTENT STANDARD	**NGSS.MS-LS.**	**LIFE SCIENCE**
BENCHMARK / STANDARD	**MS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
PERFORMANCE STANDARD / INDICATOR	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

STRAND / CONTENT STANDARD	**NGSS.MS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK / STANDARD	**MS-ESS2.**	**Earth's Systems**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

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-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
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-ESS3-5.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.
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

Science

Grade **8** - Adopted: **2013**

STRAND / CONTENT STANDARD	**NGSS.MS-PS.**	**PHYSICAL SCIENCE**
BENCHMARK / STANDARD	**MS-PS3.**	**Energy**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	MS-PS3-3.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
STRAND / CONTENT STANDARD	**NGSS.MS-LS.**	**LIFE SCIENCE**
BENCHMARK / STANDARD	**MS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**

PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
PERFORMANCE STANDARD / INDICATOR	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
STRAND / CONTENT STANDARD	**NGSS.MS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK / STANDARD	**MS-ESS2.**	**Earth's Systems**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
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-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
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-ESS3-5.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.
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-DA.**	**Data & Analysis**
PERFORMANCE STANDARD / INDICATOR		**Inference & Models**
INDICATOR	2-DA-09.	Refine computational models based on the data they have generated. (P5.3, P4.4)

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		**Variables**
INDICATOR	2-AP-11.	Create clearly named variables that represent different data types and perform operations on their values. (P5.1, P5.2)

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		**Control**

INDICATOR	2-AP-12.	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. (P5.1, P5.2)

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		**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-18.	Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts. (P2.2)

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)

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		**Safety, Law, & Ethics**
INDICATOR	2-IC-23.	Describe tradeoffs between allowing information to be public and keeping information private and secure. (P7.2)

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-DA.**	**Data & Analysis**
PERFORMANCE STANDARD / INDICATOR		**Inference & Models**
INDICATOR	2-DA-09.	Refine computational models based on the data they have generated. (P5.3, P4.4)

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		**Variables**
INDICATOR	2-AP-11.	Create clearly named variables that represent different data types and perform operations on their values. (P5.1, P5.2)

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		**Control**
INDICATOR	2-AP-12.	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. (P5.1, P5.2)

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		**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-18.	Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts. (P2.2)

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)

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		**Safety, Law, & Ethics**
INDICATOR	2-IC-23.	Describe tradeoffs between allowing information to be public and keeping information private and secure. (P7.2)

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.
CATEGORY / CLUSTER / KEY IDEA	MP.8	Look for and express regularity in repeated reasoning.

STRAND / DOMAIN / UNIFYING THEME		Grade 7
CATEGORY / CLUSTER / KEY IDEA	**NY-7.EE.**	**Expressions, Equations, and Inequalities**
STANDARD / CONCEPTUAL UNDERSTANDING		**Solve real-life and mathematical problems using numerical and algebraic expressions, equations, and inequalities.**
EXPECTATION / CONTENT SPECIFICATION	**NY-7.EE.4.**	**Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.**
GRADE EXPECTATION	NY-7.EE.4.a.	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.

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.
CATEGORY / CLUSTER / KEY IDEA	MP.8	Look for and express regularity in repeated reasoning.

STRAND / DOMAIN / UNIFYING THEME		Grade 8
CATEGORY / CLUSTER / KEY IDEA	**NY-8.EE.**	**Expressions, Equations, and Inequalities**
STANDARD / CONCEPTUAL UNDERSTANDING		**Understand the connections between proportional relationships, lines, and linear equations.**
EXPECTATION / CONTENT SPECIFICATION	NY-8.EE.5.	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

New York State Learning Standards and Core Curriculum

Science

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

STRAND / DOMAIN / UNIFYING THEME	NY.MS.4.	Energy

CATEGORY / CLUSTER / KEY IDEA		Students who demonstrate understanding can:
STANDARD / CONCEPTUAL UNDERSTANDING	MS-PS3-3.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

STRAND / DOMAIN / UNIFYING THEME	NY.MS.7.	Matter and Energy in Organisms and Ecosystems
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

STRAND / DOMAIN / UNIFYING THEME	NY.MS.8.	Interdependent Relationships in Ecosystems
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and protecting ecosystem stability.

STRAND / DOMAIN / UNIFYING THEME	NY.MS.12.	History of Earth
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying temporal and spatial scales.

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-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

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-PS3-3.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

STRAND / DOMAIN / UNIFYING THEME	**NY.MS.7.**	**Matter and Energy in Organisms and Ecosystems**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

STRAND / DOMAIN / UNIFYING THEME	**NY.MS.8.**	**Interdependent Relationships in Ecosystems**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and protecting ecosystem stability.

STRAND / DOMAIN / UNIFYING THEME	NY.MS.12.	History of Earth
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying temporal and spatial scales.

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-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
STANDARD / CONCEPTUAL UNDERSTANDING	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

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.

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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.

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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	**2.1.**	**Information Systems: Information technology is used to retrieve, process, and communicate information and as a tool to enhance learning.**

STANDARD / CONCEPTUAL UNDERSTANDING	2.1.5.	Students use simple modeling programs to make predictions.
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.7.**	**Interdisciplinary Problem Solving: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.**
CATEGORY / CLUSTER / KEY IDEA	**7.1.**	**Connections: The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision making, design, and inquiry into phenomena.**
STANDARD / CONCEPTUAL UNDERSTANDING	7.1.3.	Students design solutions to problems involving a familiar and real context, investigate related science concepts to inform the solution, and use mathematics to model, quantify, measure, and compute.
STANDARD / CONCEPTUAL UNDERSTANDING	7.1.4.	Students observe phenomena and evaluate them scientifically and mathematically by conducting a fair test of the effect of variables and using mathematical knowledge and technological tools to collect, analyze, and present data and conclusions.
STRAND / DOMAIN / UNIFYING THEME	**NY.7.**	**Interdisciplinary Problem Solving: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.**
CATEGORY / CLUSTER / KEY IDEA	**7.2.**	**Strategies: Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.**
STANDARD / CONCEPTUAL UNDERSTANDING	7.2.1.	Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to work effectively (Contributing to the work of a brainstorming group, laboratory partnership, cooperative learning group, or project team; planning procedures; identify and managing responsibilities of team members; and staying on task, whether working alone or as part of a group.)
STANDARD / CONCEPTUAL UNDERSTANDING	7.2.2.	Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to gather and process information (Accessing information from printed media, electronic data bases, and community resources and using the information to develop a definition of the problem and to research possible solutions.)
STANDARD / CONCEPTUAL UNDERSTANDING	7.2.3.	Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to generate and analyze ideas (Developing ideas for proposed solutions, investigating ideas, collecting data, and showing relationships and patterns in the data.)

STANDARD / CONCEPTUAL UNDERSTANDING	7.2.4.	Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to observe common themes (Observing examples of common unifying themes, applying them to the problem, and using them to better understand the dimensions of the problem.)
STANDARD / CONCEPTUAL UNDERSTANDING	7.2.5.	Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to realize ideas (Constructing components or models, arriving at a solution, and evaluating the result.)
STANDARD / CONCEPTUAL UNDERSTANDING	7.2.6.	Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to present results (Using a variety of media to present the solution and to communicate the results.)

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	**2.1.**	**Information Systems: Information technology is used to retrieve, process, and communicate information and as a tool to enhance learning.**
STANDARD / CONCEPTUAL UNDERSTANDING	2.1.5.	Students use simple modeling programs to make predictions.

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.7.**	**Interdisciplinary Problem Solving: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.**
CATEGORY / CLUSTER / KEY IDEA	**7.1.**	**Connections: The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision making, design, and inquiry into phenomena.**
STANDARD / CONCEPTUAL UNDERSTANDING	7.1.3.	Students design solutions to problems involving a familiar and real context, investigate related science concepts to inform the solution, and use mathematics to model, quantify, measure, and compute.

STANDARD / CONCEPTUAL UNDERSTANDING	7.1.4.	Students observe phenomena and evaluate them scientifically and mathematically by conducting a fair test of the effect of variables and using mathematical knowledge and technological tools to collect, analyze, and present data and conclusions.
STRAND / DOMAIN / UNIFYING THEME	**NY.7.**	**Interdisciplinary Problem Solving: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.**
CATEGORY / CLUSTER / KEY IDEA	**7.2.**	**Strategies: Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.**
STANDARD / CONCEPTUAL UNDERSTANDING	7.2.1.	Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to work effectively (Contributing to the work of a brainstorming group, laboratory partnership, cooperative learning group, or project team; planning procedures; identify and managing responsibilities of team members; and staying on task, whether working alone or as part of a group.)
STANDARD / CONCEPTUAL UNDERSTANDING	7.2.2.	Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to gather and process information (Accessing information from printed media, electronic data bases, and community resources and using the information to develop a definition of the problem and to research possible solutions.)
STANDARD / CONCEPTUAL UNDERSTANDING	7.2.3.	Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to generate and analyze ideas (Developing ideas for proposed solutions, investigating ideas, collecting data, and showing relationships and patterns in the data.)
STANDARD / CONCEPTUAL UNDERSTANDING	7.2.4.	Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to observe common themes (Observing examples of common unifying themes, applying them to the problem, and using them to better understand the dimensions of the problem.)
STANDARD / CONCEPTUAL UNDERSTANDING	7.2.5.	Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to realize ideas (Constructing components or models, arriving at a solution, and evaluating the result.)
STANDARD / CONCEPTUAL UNDERSTANDING	7.2.6.	Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to present results (Using a variety of media to present the solution and to communicate the results.)

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.
STRAND / ESSENTIAL STANDARD	MP.8.	Look for and express regularity in repeated reasoning.
CONTENT AREA / STRAND		**Ratio and Proportional Relationships**
STRAND / ESSENTIAL STANDARD		**Analyze proportional relationships and use them to solve real-world and mathematical problems.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**NC.7.RP.2.**	**Recognize and represent proportional relationships between quantities.**
CLARIFYING OBJECTIVE	NC.7.RP.2.c.	Create equations and graphs to represent proportional relationships.
CONTENT AREA / STRAND		**Expressions and Equations**
STRAND / ESSENTIAL STANDARD		**Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**NC.7.EE.4.**	**Use variables to represent quantities to solve real-world or mathematical problems.**
CLARIFYING OBJECTIVE	**NC.7.EE.4.b.**	**Construct inequalities to solve problems by reasoning about the quantities.**
INDICATOR	NC.7.EE.4.b.2.	Compare an algebraic solution process for equations and an algebraic solution process for inequalities.

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.
STRAND / ESSENTIAL STANDARD	MP.8.	Look for and express regularity in repeated reasoning.

CONTENT AREA / STRAND		**Functions**
STRAND / ESSENTIAL STANDARD		**Use functions to model relationships between quantities.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**NC.8.F.4.**	**Analyze functions that model linear relationships.**
CLARIFYING OBJECTIVE	NC.8.F.4.c.	Construct a graph of a linear relationship given an equation in slope-intercept form.

North Carolina Standard Course of Study

Science

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

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.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.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.4.c.	Students develop, test and refine prototypes as part of a cyclical design process.

CONTENT AREA / STRAND		Digital Learning Standards
STRAND / ESSENTIAL STANDARD	**ISTE-S.6.**	**Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.6.c.	Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

CONTENT AREA / STRAND		Digital Learning Standards
STRAND / ESSENTIAL STANDARD	**ISTE-S.7.**	**Global Collaborator: Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.7.b.	Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.7.d.	Students explore local and global issues and use collaborative technologies to work with others to investigate 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		**Data & Analysis**
CLARIFYING OBJECTIVE		**Inference & Models**
INDICATOR	68-DA-04.	Refine computational models based on the data they have generated and/or data collected.

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		**Variables**
INDICATOR	68-AP-02.	Create clearly named variables that represent different data types.

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		**Control**
INDICATOR	68-AP-03.	Design and iteratively develop programs that combine control structures including nested loops and compound conditionals.
INDICATOR	68-AP-04.	Construct programs that include events.

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.
INDICATOR	68-AP-11.	Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.

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.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.4.c.	Students develop, test and refine prototypes as part of a cyclical design process.

CONTENT AREA / STRAND		Digital Learning Standards

STRAND / ESSENTIAL STANDARD	**ISTE-S.6.**	**Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.6.c.	Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

CONTENT AREA / STRAND		**Digital Learning Standards**
STRAND / ESSENTIAL STANDARD	**ISTE-S.7.**	**Global Collaborator: Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.7.b.	Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.7.d.	Students explore local and global issues and use collaborative technologies to work with others to investigate 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		**Data & Analysis**
CLARIFYING OBJECTIVE		**Inference & Models**
INDICATOR	68-DA-04.	Refine computational models based on the data they have generated and/or data collected.

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		**Variables**
INDICATOR	68-AP-02.	Create clearly named variables that represent different data types.

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		**Control**
INDICATOR	68-AP-03.	Design and iteratively develop programs that combine control structures including nested loops and compound conditionals.
INDICATOR	68-AP-04.	Construct programs that include events.

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.
INDICATOR	68-AP-11.	Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.

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.
BENCHMARK	MP.8	Look for and express regularity in repeated reasoning.
CONTENT STANDARD		**Expressions and Equations**
BENCHMARK		**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**
GRADE LEVEL EXPECTATION	**7.EE.4**	**Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.**
INDICATOR	7.EE.4.a.	Solve word problems leading to equations of the form px+q=r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare the algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.

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.
BENCHMARK	MP.8	Look for and express regularity in repeated reasoning.
CONTENT STANDARD		**Expressions and Equations**
BENCHMARK		**Understand the connections between proportional relationships, lines, and linear equations.**
GRADE LEVEL EXPECTATION	8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

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-ESS2.**	**Earth's Systems**
GRADE LEVEL EXPECTATION	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying times and spatial scales.

CONTENT STANDARD		**Earth and Space Science (ESS)**
BENCHMARK	**MS-ESS3.**	**Earth and Human Activity**
GRADE LEVEL EXPECTATION	MS-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events that necessitate the development of technologies to mitigate their effects.
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-ESS3-5.	Investigate factors that have caused changes in global temperatures over time.

CONTENT STANDARD		**Life Science (LS)**
BENCHMARK	**MS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
GRADE LEVEL EXPECTATION	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
GRADE LEVEL EXPECTATION	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

CONTENT STANDARD		**Physical Science (PS)**
BENCHMARK	**MS-PS3.**	**ENERGY**

GRADE LEVEL EXPECTATION	MS-PS3-3.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
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-ESS2.**	**Earth's Systems**
GRADE LEVEL EXPECTATION	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying times and spatial scales.
CONTENT STANDARD		**Earth and Space Science (ESS)**
BENCHMARK	**MS-ESS3.**	**Earth and Human Activity**
GRADE LEVEL EXPECTATION	MS-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events that necessitate the development of technologies to mitigate their effects.
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-ESS3-5.	Investigate factors that have caused changes in global temperatures over time.
CONTENT STANDARD		**Life Science (LS)**
BENCHMARK	**MS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
GRADE LEVEL EXPECTATION	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
GRADE LEVEL EXPECTATION	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
CONTENT STANDARD		**Physical Science (PS)**
BENCHMARK	**MS-PS3.**	**ENERGY**
GRADE LEVEL EXPECTATION	MS-PS3-3.	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
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.8.	Use models and simulations to investigate and explain systems and issues.

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

CONTENT STANDARD		**Computer Science and Cybersecurity Standards**
BENCHMARK		**Computational Thinking**
GRADE LEVEL EXPECTATION		**Development & Design**

INDICATOR		**Design processes to create new, useful, and imaginative solutions to solve problems.**
INDICATOR	7.DD.1.	Modify programs that utilize combinations of loops, conditionals, and the manipulation of variables representing different data types.

CONTENT STANDARD		**Computer Science and Cybersecurity Standards**
BENCHMARK		**Information Literacy**
GRADE LEVEL EXPECTATION		**Create**
INDICATOR		**It is important to both consume and produce information to be digitally literate.**
INDICATOR	7.C.1.	Continued growth in digital literacy used to consume and produce information.

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.8.	Use models and simulations to investigate and explain systems and issues.

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

CONTENT STANDARD		**Computer Science and Cybersecurity Standards**
BENCHMARK		**Computational Thinking**
GRADE LEVEL EXPECTATION		**Development & Design**
INDICATOR		**Design processes to create new, useful, and imaginative solutions to solve problems.**
INDICATOR	8.DD.1.	Create programs that utilize combinations of loops, conditionals, and the manipulation of variables representing different data types.

CONTENT STANDARD		**Computer Science and Cybersecurity Standards**
BENCHMARK		**Information Literacy**
GRADE LEVEL EXPECTATION		**Create**
INDICATOR		**It is important to both consume and produce information to be digitally literate.**
INDICATOR	8.C.1.	Continued growth in digital literacy used to consume and produce information.

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.
STANDARD / BENCHMARK	MP.8.	Look for and express regularity in repeated reasoning.

DOMAIN / ACADEMIC CONTENT STANDARD	OH.7.EE.	EXPRESSIONS AND EQUATIONS
STANDARD / BENCHMARK		**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**
BENCHMARK / GRADE LEVEL INDICATOR	**7.EE.4.**	**Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.**
PROFICIENCY LEVEL	7.EE.4.a.	Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

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.
STANDARD / BENCHMARK	MP.8.	Look for and express regularity in repeated reasoning.
DOMAIN / ACADEMIC CONTENT STANDARD	**OH.8.EE.**	**EXPRESSIONS AND EQUATIONS**
STANDARD / BENCHMARK		**Understand the connections between proportional relationships, lines, and linear equations.**
BENCHMARK / GRADE LEVEL INDICATOR	8.EE.5.	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

Ohio Learning Standards

Science

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

DOMAIN / ACADEMIC CONTENT STANDARD		**LIFE SCIENCE (LS)**
STANDARD / BENCHMARK		**Topic: Cycles of Matter and Flow of Energy - This topic focuses on the impact of matter and energy transfer within the biotic component of ecosystems.**
BENCHMARK / GRADE LEVEL INDICATOR	**7.LS.2:**	**In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.**
PROFICIENCY LEVEL		Ecosystems are dynamic in nature; the number and types of species fluctuate over time. Disruptions, deliberate or inadvertent, to the physical (abiotic) or biological (biotic) components of an ecosystem impact the composition of an ecosystem.
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		Thermal energy can be transferred through radiation, convection and conduction.

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 1:**	**Demonstrate an understanding of technology's impact on the advancement of humanity – economically, environmentally and ethically.**
PROFICIENCY LEVEL	6-8.ST.1.b.	Explore the advantages and disadvantages of widespread use, accessibility, and reliance on technology in your world.
PROFICIENCY LEVEL	6-8.ST.1.d.	Analyze an environmental concern and investigate technology solutions to that problem.

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.

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

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		**Machine Learning**
PROFICIENCY LEVEL	AI.ML.7.a.	Model how unsupervised learning finds patterns in unlabeled data to identify how machine learning takes place.

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 1:**	**Demonstrate an understanding of technology's impact on the advancement of humanity – economically, environmentally and ethically.**
PROFICIENCY LEVEL	6-8.ST.1.b.	Explore the advantages and disadvantages of widespread use, accessibility, and reliance on technology in your world.
PROFICIENCY LEVEL	6-8.ST.1.d.	Analyze an environmental concern and investigate technology solutions to that problem.

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.

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

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 8**
STANDARD / BENCHMARK		**NETWORKS AND THE INTERNET**
BENCHMARK / GRADE LEVEL INDICATOR		**Internet of Things (IoT)**
PROFICIENCY LEVEL	NI.IOT.8.b.	Model the lifecycle of information in the IoT including data gathering, transmission, reception and analysis to recreate a real-world scenario.

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		**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		**Machine Learning**
PROFICIENCY LEVEL	AI.ML.8.a.	Explain the difference between training and using a reasoning model to identify how a machine learns.
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.

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.1.**	**Explain the concept of proportionality in mathematical models and situations and distinguish between proportional and non-proportional relationships.**

SKILL / CONCEPT	7.A.1.2.	Recognize that the graph of a proportional relationship is a line through the origin and the coordinate (1, r), where r is the slope and the unit rate (constant of proportionality, k).

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	PA.	Pre-Algebra (PA)
STRAND / STANDARD	**PA.A.**	**Algebraic Reasoning & Algebra (A)**
OBJECTIVE	**PA.A.1.**	**Explain the concept of function in mathematical situations and distinguish between the concepts of linear and nonlinear functions.**
SKILL / CONCEPT	PA.A.1.2.	Use linear functions to represent and model mathematical situations.

CONTENT STANDARD / COURSE	PA.	Pre-Algebra (PA)
STRAND / STANDARD	**PA.A.**	**Algebraic Reasoning & Algebra (A)**
OBJECTIVE	**PA.A.2.**	**Identify and justify linear functions using mathematical models and situations; solve problems involving linear functions and interpret results in the original context.**
SKILL / CONCEPT	PA.A.2.2.	Identify, describe, and analyze linear relationships between two variables.

SKILL / CONCEPT	PA.A.2.5.	Solve problems involving linear functions and interpret results in the original context.

CONTENT STANDARD / COURSE	**A1.**	**Algebra 1 (A1)**
STRAND / STANDARD	**A1.A.**	**Algebraic Reasoning & Algebra (A)**
OBJECTIVE	**A1.A.4.**	**Analyze real-world and mathematical problems involving linear equations.**
SKILL / CONCEPT	A1.A.4.3.	Write the equation of the line given its slope and y-intercept, slope and one point, two points, x- and y-intercepts, or a set of data points.
SKILL / CONCEPT	A1.A.4.4.	Express linear equations in slope-intercept, point-slope, and standard forms. Convert between these forms.
SKILL / CONCEPT	A1.A.4.5.	Analyze and interpret associations between graphical representations and written scenarios.

Oklahoma Academic Standards

Science

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

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**Ecosystems: Interactions, Energy, and Dynamics (LS2)**
OBJECTIVE	7.LS2.4	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
OBJECTIVE	7.LS2.5	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**Earth and Human Activity (ESS3)**
OBJECTIVE	7.ESS3.3	Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.
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	**7**	**Seventh Grade (7)**
OBJECTIVE	**7.DA.**	**Data Analysis (DA)**
SKILL / CONCEPT	**7.DA.S.**	**Storage (S)**
SKILL	7.DA.S.01.	Create and compare multiple representations of the same data.
CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD	**7**	**Seventh Grade (7)**
OBJECTIVE	**7.DA.**	**Data Analysis (DA)**
SKILL / CONCEPT	**7.DA.IM.**	**Inference & Models (IM)**
SKILL	7.DA.IM.01.	Discuss the accuracy of a model representing a system by comparing the model's generated results with observed data from the modeled system.
CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**

STRAND / STANDARD	**7**	**Seventh Grade (7)**
OBJECTIVE	**7.AP.**	**Algorithms & Programming (AP)**
SKILL / CONCEPT	**7.AP.C.**	**Control (C)**
SKILL	7.AP.C.01.	Develop programs that utilize combinations of repetition, compound conditionals, and the manipulation of variables representing different data types.

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.02.	Incorporate existing code, media, and libraries into original programs of increasing complexity and give attribution.
SKILL	7.AP.PD.04.	Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards - Computer Science**
STRAND / STANDARD	**7**	**Seventh Grade (7)**
OBJECTIVE	**7.IC.**	**Impacts of Computing (IC)**
SKILL / CONCEPT	**7.IC.CU.**	**Culture (CU)**
SKILL	7.IC.CU.02.	Identify real-world problems in relation to the distribution of computing resources in society.

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.
OBJECTIVE	ISTE-S.4.c.	Students develop, test and refine prototypes as part of a cyclical design process.

CONTENT STANDARD / COURSE		**ISTE for Students 2016 (ISTE-S)**
STRAND / STANDARD	**ISTE-S.6.**	**Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.**
OBJECTIVE	ISTE-S.6.c.	Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

CONTENT STANDARD / COURSE		**ISTE for Students 2016 (ISTE-S)**
STRAND / STANDARD	**ISTE-S.7.**	**Global Collaborator: Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.**
OBJECTIVE	ISTE-S.7.b.	Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.
OBJECTIVE	ISTE-S.7.d.	Students explore local and global issues and use collaborative technologies to work with others to investigate 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	8	Eighth Grade (8)
OBJECTIVE	8.DA.	Data Analysis (DA)
SKILL / CONCEPT	8.DA.IM.	Inference & Models (IM)
SKILL	8.DA.IM.01.	Refine computational models based on the data generated by the models.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards - Computer Science
STRAND / STANDARD	8	Eighth Grade (8)
OBJECTIVE	8.AP.	Algorithms & Programming (AP)
SKILL / CONCEPT	8.AP.C.	Control (C)
SKILL	8.AP.C.01.	Develop programs that utilize combinations of nested loops, compound conditionals, procedures without parameters, and the manipulation of variables representing different data types.

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.02.	Incorporate existing code, media, and libraries into original programs of increasing complexity and give attribution.
SKILL	8.AP.PD.04.	Model effective communication between participants and demonstrate successful collaboration when developing computational artifacts.

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.
OBJECTIVE	ISTE-S.4.c.	Students develop, test and refine prototypes as part of a cyclical design process.
CONTENT STANDARD / COURSE		**ISTE for Students 2016 (ISTE-S)**
STRAND / STANDARD	**ISTE-S.6.**	**Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.**
OBJECTIVE	ISTE-S.6.c.	Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
CONTENT STANDARD / COURSE		**ISTE for Students 2016 (ISTE-S)**
STRAND / STANDARD	**ISTE-S.7.**	**Global Collaborator: Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.**
OBJECTIVE	ISTE-S.7.b.	Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.
OBJECTIVE	ISTE-S.7.d.	Students explore local and global issues and use collaborative technologies to work with others to investigate 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.
CONTENT STANDARD / PROFICIENCY	8	Look for and express regularity in repeated reasoning

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.

CONTENT STANDARD / PROFICIENCY	8	Look for and express regularity in repeated reasoning

STANDARD / CONTENT AREA		**Grade 8 Standards**
CONTENT STANDARD / PROFICIENCY	**8.AEE.**	**Algebraic Reasoning: Expressions and Equations (8.AEE)**
BENCHMARK / STRAND	**8.AEE.B.**	**Understand the connections between proportional relationships, lines, and linear equations.**
EXPECTATION / BENCHMARK	8.AEE.B.5.	Graph proportional relationships in authentic contexts. Interpret the unit rate as the slope of the graph, and compare two different proportional relationships represented in different ways.

Oregon Academic Content Standards

Science

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

STANDARD / CONTENT AREA	**OR.MS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
BENCHMARK / STRAND	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

STANDARD / CONTENT AREA	**OR.MS-ESS2.**	**Earth's Systems**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

STANDARD / CONTENT AREA	**OR.MS-ESS3.**	**Earth and Human Activity**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	MS-ESS3-2.	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

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-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.

Pennsylvania Core and Academic Standards

Mathematics

Grade **7** - Adopted: **2014**

SUBJECT / STANDARD AREA	PA.CC.MP.	Standards for Mathematical Practice
STANDARD AREA / STATEMENT	CC.MP.1.	Make sense of problems and persevere in solving them.
STANDARD AREA / STATEMENT	CC.MP.2.	Reason abstractly and quantitatively.
STANDARD AREA / STATEMENT	CC.MP.3.	Construct viable arguments and critique the reasoning of others.
STANDARD AREA / STATEMENT	CC.MP.4.	Model with mathematics.
STANDARD AREA / STATEMENT	CC.MP.6.	Attend to precision.
STANDARD AREA / STATEMENT	CC.MP.7.	Look for and make use of structure.
STANDARD AREA / STATEMENT	CC.MP.8.	Look for and express regularity in repeated reasoning.

Pennsylvania Core and Academic Standards

Mathematics

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

SUBJECT / STANDARD AREA	PA.CC.MP.	Standards for Mathematical Practice

STANDARD AREA / STATEMENT	CC.MP.1.	Make sense of problems and persevere in solving them.
STANDARD AREA / STATEMENT	CC.MP.2.	Reason abstractly and quantitatively.
STANDARD AREA / STATEMENT	CC.MP.3.	Construct viable arguments and critique the reasoning of others.
STANDARD AREA / STATEMENT	CC.MP.4.	Model with mathematics.
STANDARD AREA / STATEMENT	CC.MP.6.	Attend to precision.
STANDARD AREA / STATEMENT	CC.MP.7.	Look for and make use of structure.
STANDARD AREA / STATEMENT	CC.MP.8.	Look for and express regularity in repeated reasoning.
SUBJECT / STANDARD AREA	**PA.CC.2.2.8.**	**Algebraic Concepts**
STANDARD AREA / STATEMENT	**CC.2.2.8.B.**	**Expressions and Equations**
STANDARD	CC.2.2.8.B.2.	Understand the connections between proportional relationships, lines, and linear equations.
STANDARD	CC.2.2.8.B.3.	Analyze and solve linear equations and pairs of simultaneous linear equations.

Pennsylvania Core and Academic Standards

Science

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

SUBJECT / STANDARD AREA	**PA.SI.**	**Science as Inquiry**
STANDARD AREA / STATEMENT	SI.5.	Use appropriate tools and technologies to gather, analyze, and interpret data and understand that it enhances accuracy and allows scientists to analyze and quantify results of investigations.
STANDARD AREA / STATEMENT	SI.6.	Develop descriptions, explanations, and models using evidence and understand that these emphasize evidence, have logically consistent arguments, and are based on scientific principles, models, and theories.

SUBJECT / STANDARD AREA	**PA.3.**	**Science and Technology and Engineering Education**
STANDARD AREA / STATEMENT	**3.2.**	**Physical Sciences: Chemistry and Physics**
STANDARD	**3.2.B.**	**Physics**
DESCRIPTOR / STANDARD	3.2.7.B3a.	Differentiate among convection, conduction, and radiation.
DESCRIPTOR / STANDARD	3.2.7.B6b.	(ENERGY) Demonstrate how the transfer of heat energy causes temperature changes.

SUBJECT / STANDARD AREA	**PA.3.**	**Science and Technology and Engineering Education**
STANDARD AREA / STATEMENT	**3.4.**	**Technology and Engineering Education**
STANDARD	**3.4.A.**	**The Scope of Technology**
DESCRIPTOR / STANDARD	3.4.7.A2.	Explain how different technologies involve different sets of processes.
DESCRIPTOR / STANDARD	3.4.7.A3.	Explain how knowledge gained from other fields of study has a direct effect on the development of technological products and systems.

SUBJECT / STANDARD AREA	**PA.3.**	**Science and Technology and Engineering Education**
STANDARD AREA / STATEMENT	**3.4.**	**Technology and Engineering Education**
STANDARD	**3.4.B.**	**Technology and Society**
DESCRIPTOR / STANDARD	3.4.7.B1.	Explain how the use of technology can have consequences that affect humans in many ways.

SUBJECT / STANDARD AREA	**PA.3.**	**Science and Technology and Engineering Education**
STANDARD AREA / STATEMENT	**3.4.**	**Technology and Engineering Education**
STANDARD	**3.4.C.**	**Technology and Engineering Design**
DESCRIPTOR / STANDARD	3.4.7.C1.	Describe how design, as a creative planning process, leads to useful products and systems.
DESCRIPTOR / STANDARD	3.4.7.C2.	Explain how modeling, testing, evaluating, and modifying are used to transform ideas into practical solutions.
DESCRIPTOR / STANDARD	3.4.7.C3.	Describe how troubleshooting as a problem-solving method may identify the cause of a malfunction in a technological system.

SUBJECT / STANDARD AREA	**PA.3.**	**Science and Technology and Engineering Education**
STANDARD AREA / STATEMENT	**3.4.**	**Technology and Engineering Education**
STANDARD	**3.4.D.**	**Abilities for a Technological World**
DESCRIPTOR / STANDARD	3.4.7.D1.	Identify and collect information about everyday problems that can be solved by technology and generate ideas and requirements for solving a problem.
DESCRIPTOR / STANDARD	3.4.7.D2.	Select and safely use appropriate tools, products and systems for specific tasks.
DESCRIPTOR / STANDARD	3.4.7.D3.	Use data collected to analyze and interpret trends in order to identify the positive or negative effects of a technology.

SUBJECT / STANDARD AREA	**PA.4.**	**Environment and Ecology**
STANDARD AREA / STATEMENT	**4.1.**	**Ecology**
STANDARD	**4.1.7.E.**	**Identify factors that contribute to change in natural and human-made systems.**
DESCRIPTOR / STANDARD	4.1.7.E.1.	Explain the processes of primary and secondary succession in a given ecosystem.

SUBJECT / STANDARD AREA	**PA.4.**	**Environment and Ecology**
STANDARD AREA / STATEMENT	**4.3.**	**Natural Resources**
STANDARD	**4.3.7.B.**	**Explain the distribution and management of natural resources.**
DESCRIPTOR / STANDARD	4.3.7.B.1.	conservation, preservation, and exploitation.

SUBJECT / STANDARD AREA	**PA.4.**	**Environment and Ecology**
STANDARD AREA / STATEMENT	**4.5.**	**Humans and the Environment**
STANDARD	**4.5.7.A.**	**Describe how the development of civilization affects the use of natural resources.**
DESCRIPTOR / STANDARD	4.5.7.A.1.	Compare and contrast how people use natural resources in sustainable and nonsustainable ways throughout the world.

Grade **7** - Adopted: **2014**

SUBJECT / STANDARD AREA	**PA.CC.3.5.6-8.**	**Reading Informational Text: Students read, understand, and respond to informational text – with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.**

STANDARD AREA / STATEMENT		**Key Ideas and Details**
STANDARD	CC.3.5.6-8.B.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
STANDARD	CC.3.5.6-8.C.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
SUBJECT / STANDARD AREA	**PA.CC.3.5.6-8.**	**Reading Informational Text: Students read, understand, and respond to informational text – with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.**
STANDARD AREA / STATEMENT		**Craft and Structure**
STANDARD	CC.3.5.6-8.D.	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	CC.3.5.6-8.E.	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.
SUBJECT / STANDARD AREA	**PA.CC.3.5.6-8.**	**Reading Informational Text: Students read, understand, and respond to informational text – with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.**
STANDARD AREA / STATEMENT		**Integration of Knowledge and Ideas**
STANDARD	CC.3.5.6-8.I.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
SUBJECT / STANDARD AREA	**PA.CC.3.5.6-8.**	**Reading Informational Text: Students read, understand, and respond to informational text – with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.**
STANDARD AREA / STATEMENT		**Range and Level of Complex Texts**
STANDARD	CC.3.5.6-8.J.	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.
SUBJECT / STANDARD AREA	**PA.CC.3.6.6-8.**	**Writing: Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.**
STANDARD AREA / STATEMENT		**Text Types and Purposes**
STANDARD	**CC.3.6.6-8.B.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
DESCRIPTOR / STANDARD	CC.3.6.6-8.B.4.	Use precise language and domain-specific vocabulary to inform about or explain the topic.
SUBJECT / STANDARD AREA	**PA.CC.3.6.6-8.**	**Writing: Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.**

STANDARD AREA / STATEMENT		**Production and Distribution of Writing**
STANDARD	CC.3.6.6-8.C.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
STANDARD	CC.3.6.6-8.E.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Pennsylvania Core and Academic Standards

Science

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

SUBJECT / STANDARD AREA	**PA.SI.**	**Science as Inquiry**
STANDARD AREA / STATEMENT	SI.4.	Formulate and revise explanations and models using logic and evidence.
STANDARD AREA / STATEMENT	SI.5.	Recognize and analyze alternative explanations and models.

SUBJECT / STANDARD AREA	**PA.3.**	**Science and Technology and Engineering Education**
STANDARD AREA / STATEMENT	**3.2.**	**Physical Sciences: Chemistry and Physics**
STANDARD	**3.2.B.**	**Physics**
DESCRIPTOR / STANDARD	3.2.8.B4.	Compare and contrast atomic properties of conductors and insulators.

SUBJECT / STANDARD AREA	**PA.3.**	**Science and Technology and Engineering Education**
STANDARD AREA / STATEMENT	**3.4.**	**Technology and Engineering Education**
STANDARD	**3.4.B.**	**Technology and Society**
DESCRIPTOR / STANDARD	3.4.8.B4.	Explain how societal and cultural priorities and values are reflected in technological devices.

SUBJECT / STANDARD AREA	**PA.3.**	**Science and Technology and Engineering Education**
STANDARD AREA / STATEMENT	**3.4.**	**Technology and Engineering Education**
STANDARD	**3.4.C.**	**Technology and Engineering Design**

DESCRIPTOR / STANDARD	3.4.8.C1.	Evaluate the criteria and constraints of a design.
DESCRIPTOR / STANDARD	3.4.8.C3.	Analyze how a multidisciplinary (STEM) approach to problem solving will yield greater results.
SUBJECT / STANDARD AREA	**PA.3.**	**Science and Technology and Engineering Education**
STANDARD AREA / STATEMENT	**3.4.**	**Technology and Engineering Education**
STANDARD	**3.4.D.**	**Abilities for a Technological World**
DESCRIPTOR / STANDARD	3.4.8.D1.	Test and evaluate the solutions for a design problem.
DESCRIPTOR / STANDARD	3.4.8.D2.	Operate and maintain systems in order to achieve a given purpose.
DESCRIPTOR / STANDARD	3.4.8.D3.	Interpret and evaluate the accuracy of the information obtained and determine its usefulness.

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

SUBJECT / STANDARD AREA	**PA.CC.3.5.6-8.**	**Reading Informational Text: Students read, understand, and respond to informational text – with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.**
STANDARD AREA / STATEMENT		**Key Ideas and Details**
STANDARD	CC.3.5.6-8.B.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
STANDARD	CC.3.5.6-8.C.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
SUBJECT / STANDARD AREA	**PA.CC.3.5.6-8.**	**Reading Informational Text: Students read, understand, and respond to informational text – with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.**
STANDARD AREA / STATEMENT		**Craft and Structure**
STANDARD	CC.3.5.6-8.D.	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	CC.3.5.6-8.E.	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.
SUBJECT / STANDARD AREA	**PA.CC.3.5.6-8.**	**Reading Informational Text: Students read, understand, and respond to informational text – with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.**
STANDARD AREA / STATEMENT		**Integration of Knowledge and Ideas**

STANDARD	CC.3.5.6-8.I.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

SUBJECT / STANDARD AREA	**PA.CC.3.5.6-8.**	**Reading Informational Text: Students read, understand, and respond to informational text – with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.**
STANDARD AREA / STATEMENT		**Range and Level of Complex Texts**

STANDARD	CC.3.5.6-8.J.	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

SUBJECT / STANDARD AREA	**PA.CC.3.6.6-8.**	**Writing: Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.**
STANDARD AREA / STATEMENT		**Text Types and Purposes**
STANDARD	**CC.3.6.6-8.B.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**

DESCRIPTOR / STANDARD	CC.3.6.6-8.B.4.	Use precise language and domain-specific vocabulary to inform about or explain the topic.

SUBJECT / STANDARD AREA	**PA.CC.3.6.6-8.**	**Writing: Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.**
STANDARD AREA / STATEMENT		**Production and Distribution of Writing**

STANDARD	CC.3.6.6-8.C.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

STANDARD	CC.3.6.6-8.E.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Pennsylvania Core and Academic Standards

Technology Education

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

SUBJECT / STANDARD AREA	**CSTA.2.**	**Level 2 (Ages 11-14)**
STANDARD AREA / STATEMENT	**2-DA.**	**Data & Analysis**
STANDARD		**Inference & Models**

DESCRIPTOR / STANDARD	2-DA-09.	Refine computational models based on the data they have generated. (P5.3, P4.4)

SUBJECT / STANDARD AREA	**CSTA.2.**	**Level 2 (Ages 11-14)**

STANDARD AREA / STATEMENT	**2-AP.**	**Algorithms & Programming**
STANDARD		**Variables**
DESCRIPTOR / STANDARD	2-AP-11.	Create clearly named variables that represent different data types and perform operations on their values. (P5.1, P5.2)

SUBJECT / STANDARD AREA	**CSTA.2.**	**Level 2 (Ages 11-14)**
STANDARD AREA / STATEMENT	**2-AP.**	**Algorithms & Programming**
STANDARD		**Control**
DESCRIPTOR / STANDARD	2-AP-12.	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. (P5.1, P5.2)

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

SUBJECT / STANDARD AREA	**CSTA.2.**	**Level 2 (Ages 11-14)**
STANDARD AREA / STATEMENT	**2-AP.**	**Algorithms & Programming**
STANDARD		**Program Development**
DESCRIPTOR / STANDARD	2-AP-18.	Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts. (P2.2)

SUBJECT / STANDARD AREA	**CSTA.2.**	**Level 2 (Ages 11-14)**
STANDARD AREA / STATEMENT	**2-IC.**	**Impacts of Computing**
STANDARD		**Social Interactions**
DESCRIPTOR / STANDARD	2-IC-22.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. (P2.4, P5.2)

SUBJECT / STANDARD AREA	**CSTA.2.**	**Level 2 (Ages 11-14)**

STANDARD AREA / STATEMENT	**2-IC.**	**Impacts of Computing**
STANDARD		**Safety, Law, & Ethics**
DESCRIPTOR / STANDARD	2-IC-23.	Describe tradeoffs between allowing information to be public and keeping information private and secure. (P7.2)

Pennsylvania Core and Academic Standards

Technology Education

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

SUBJECT / STANDARD AREA	**CSTA.2.**	**Level 2 (Ages 11-14)**
STANDARD AREA / STATEMENT	**2-DA.**	**Data & Analysis**
STANDARD		**Inference & Models**
DESCRIPTOR / STANDARD	2-DA-09.	Refine computational models based on the data they have generated. (P5.3, P4.4)

SUBJECT / STANDARD AREA	**CSTA.2.**	**Level 2 (Ages 11-14)**
STANDARD AREA / STATEMENT	**2-AP.**	**Algorithms & Programming**
STANDARD		**Variables**
DESCRIPTOR / STANDARD	2-AP-11.	Create clearly named variables that represent different data types and perform operations on their values. (P5.1, P5.2)

SUBJECT / STANDARD AREA	**CSTA.2.**	**Level 2 (Ages 11-14)**
STANDARD AREA / STATEMENT	**2-AP.**	**Algorithms & Programming**
STANDARD		**Control**
DESCRIPTOR / STANDARD	2-AP-12.	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. (P5.1, P5.2)

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

SUBJECT / STANDARD AREA	CSTA.2.	Level 2 (Ages 11-14)
STANDARD AREA / STATEMENT	2-AP.	Algorithms & Programming
STANDARD		Program Development
DESCRIPTOR / STANDARD	2-AP-18.	Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts. (P2.2)

SUBJECT / STANDARD AREA	CSTA.2.	Level 2 (Ages 11-14)
STANDARD AREA / STATEMENT	2-IC.	Impacts of Computing
STANDARD		Social Interactions
DESCRIPTOR / STANDARD	2-IC-22.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. (P2.4, P5.2)

SUBJECT / STANDARD AREA	CSTA.2.	Level 2 (Ages 11-14)
STANDARD AREA / STATEMENT	2-IC.	Impacts of Computing
STANDARD		Safety, Law, & Ethics
DESCRIPTOR / STANDARD	2-IC-23.	Describe tradeoffs between allowing information to be public and keeping information private and secure. (P7.2)