Main Criteria: Forward Education

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

Subjects: Mathematics, Science, Technology Education

Grades: 11, 12

Forward Education

Autonomous Electric Vehicles of the Future

Nebraska Content Area Standards

Mathematics

Grade **11** - Adopted: **2022**

CONTENT STANDARD		High School Standards
STRAND	**HS.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	**HS.A.1.**	**Algebraic Relationships: Students will demonstrate and represent relationships with functions.**
STRAND	HS.A.1.e.	Define, interpret, and analyze linear, quadratic, absolute value, and exponential functions using the points of interest of the functions and graphing technology.

CONTENT STANDARD		High School Standards
STRAND	**HS.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	**HS.A.2.**	**Algebraic Processes: Students will apply the operational properties when evaluating rational expressions and solving linear and quadratic equations, and inequalities.**
STRAND	HS.A.2.c.	Analyze equations and inequalities to determine and apply efficient methods to solve and use appropriate technology as needed.
STRAND	HS.A.2.e.	Write and graph equations of functions (linear, absolute value, quadratic, and exponential) using the points of interest of the function.
STRAND	HS.A.2.f.	Given a line, write the equation of a line that is parallel or perpendicular to it.

Nebraska Content Area Standards

Mathematics

Grade **12** - Adopted: **2022**

CONTENT STANDARD		High School Standards
STRAND	**HS.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	**HS.A.1.**	**Algebraic Relationships: Students will demonstrate and represent relationships with functions.**
STRAND	HS.A.1.e.	Define, interpret, and analyze linear, quadratic, absolute value, and exponential functions using the points of interest of the functions and graphing technology.

CONTENT STANDARD		High School Standards
STRAND	**HS.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	**HS.A.2.**	**Algebraic Processes: Students will apply the operational properties when evaluating rational expressions and solving linear and quadratic equations, and inequalities.**
STRAND	HS.A.2.c.	Analyze equations and inequalities to determine and apply efficient methods to solve and use appropriate technology as needed.
STRAND	HS.A.2.e.	Write and graph equations of functions (linear, absolute value, quadratic, and exponential) using the points of interest of the function.
STRAND	HS.A.2.f.	Given a line, write the equation of a line that is parallel or perpendicular to it.

Nebraska Content Area Standards

Science

Grade **11** - Adopted: **2017**

CONTENT STANDARD	**NE.SC.HS-PS.**	**HS Physical Sciences**
STRAND	**SC.HS.2.**	**Waves and Electromagnetic Radiation**
INDICATOR	**SC.HS.2.2.**	**Gather, analyze, and communicate evidence of the interactions of waves.**
STRAND	SC.HS.2.2.B.	Evaluate questions about the advantages of using digital transmission and storage of information.

CONTENT STANDARD	**NE.SC.HS-PS.**	**HS Physical Sciences**
STRAND	**SC.HS.4.**	**Energy**
INDICATOR	**SC.HS.4.4.**	**Gather, analyze, and communicate evidence of the interactions of energy.**
STRAND	SC.HS.4.4.C.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
STRAND	SC.HS.4.4.D.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

CONTENT STANDARD	**NE.SC.HS-PS.**	**HS Physical Sciences**
STRAND	**SC.HS.5.**	**Chemical Reactions**
INDICATOR	**SC.HS.5.5.**	**Gather, analyze, and communicate evidence of chemical reactions.**
STRAND	SC.HS.5.5.B.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends on the changes in total bond energy.

CONTENT STANDARD	**NE.SC.HS-LS.**	**HS Life Sciences**
STRAND	**SC.HS.7.**	**Interdependent Relationships in Ecosystems**
INDICATOR	**SC.HS.7.2.**	**Gather, analyze, and communicate evidence of interdependent relationships in ecosystems.**
STRAND	SC.HS.7.2.E.	Design, evaluate, and refine a solution for increasing the positive impacts of human activities on the environment and biodiversity.

CONTENT STANDARD	**NE.SC.HS-ESS.**	**HS Earth and Space Sciences**
STRAND	**SC.HS.12.**	**Weather and Climate**
INDICATOR	**SC.HS.12.2.**	**Gather, analyze, and communicate evidence to support that Earth's climate and weather are influenced by energy flow through Earth systems.**
STRAND	SC.HS.12.2.B.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

CONTENT STANDARD	**NE.SC.HS-ESS.**	**HS Earth and Space Sciences**
STRAND	**SC.HS.15.**	**Sustainability**
INDICATOR	**SC.HS.15.5.**	**Gather, analyze, and communicate evidence to describe the interactions between society, environment, and economy.**
STRAND	SC.HS.15.5.A.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
STRAND	SC.HS.15.5.B.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
STRAND	SC.HS.15.5.C.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
STRAND	SC.HS.15.5.D.	Evaluate or refine a technological solution that increases positive impacts of human activities on natural systems.
STRAND	SC.HS.15.5.E.	Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
STRAND	SC.HS.15.5.F.	Use a computational representation to illustrate the relationships among Earth systems and the degree to which those relationships are being modified due to human activity.

CONTENT STANDARD	**NE.SC.HSP-P.**	**HS Physics – Plus Standards**
STRAND	**SC.HSP.4.**	**Energy: Physics**
INDICATOR	**SC.HSP.4.3.**	**Gather, analyze, and communicate evidence of the interactions of energy.**
STRAND	SC.HSP.4.3.C.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
STRAND	SC.HSP.4.3.D.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

CONTENT STANDARD	**NE.SC.HSP-P.**	**HS Physics – Plus Standards**
STRAND	**SC.HSP.16.**	**Electricity and Magnetism**

INDICATOR	**SC.HSP.16.4.**	**Gather, analyze, and communicate evidence of electricity and magnetism.**
STRAND	SC.HSP.16.4.D.	Evaluate competing design solutions for construction and use of electrical consumer products accounting for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.
STRAND	SC.HSP.16.4.G.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
CONTENT STANDARD	**NE.SC.HSP-C.**	**HS Chemistry – Plus Standards**
STRAND	**SC.HSP.3.**	**Structure and Properties of Matter**
INDICATOR	**SC.HSP.3.1.**	**Gather, analyze, and communicate evidence of the structure, properties, and interactions of matter.**
STRAND	SC.HSP.3.3.D.	Evaluate a solution to a complex, real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
CONTENT STANDARD	**NE.SC.HSP-C.**	**HS Chemistry – Plus Standards**
STRAND	**SC.HSP.4.**	**Energy: Chemistry**
INDICATOR	**SC.HSP.4.2.**	**Gather, analyze, and communicate evidence of the interactions of energy.**
STRAND	SC.HSP.4.2.D.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
CONTENT STANDARD	**NE.SC.HSP-B.**	**HS Biology – Plus Standards**
STRAND	**SC.HSP.7.**	**Interdependent Relationships in Ecosystems**
INDICATOR	**SC.HSP.7.2.**	**Gather, analyze, and communicate evidence of interdependent relationships in ecosystems.**
STRAND	SC.HSP.7.2.D.	Design, evaluate, and refine a solution for increasing the positive impacts of human activities on the environment and biodiversity.

Nebraska Content Area Standards

Science

Grade **12** - Adopted: **2017**

CONTENT STANDARD	**NE.SC.HS-PS.**	**HS Physical Sciences**
STRAND	**SC.HS.2.**	**Waves and Electromagnetic Radiation**
INDICATOR	**SC.HS.2.2.**	**Gather, analyze, and communicate evidence of the interactions of waves.**
STRAND	SC.HS.2.2.B.	Evaluate questions about the advantages of using digital transmission and storage of information.

CONTENT STANDARD	**NE.SC.HS-PS.**	**HS Physical Sciences**
STRAND	**SC.HS.4.**	**Energy**
INDICATOR	**SC.HS.4.4.**	**Gather, analyze, and communicate evidence of the interactions of energy.**
STRAND	SC.HS.4.4.C.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
STRAND	SC.HS.4.4.D.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

CONTENT STANDARD	**NE.SC.HS-PS.**	**HS Physical Sciences**
STRAND	**SC.HS.5.**	**Chemical Reactions**
INDICATOR	**SC.HS.5.5.**	**Gather, analyze, and communicate evidence of chemical reactions.**
STRAND	SC.HS.5.5.B.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends on the changes in total bond energy.

CONTENT STANDARD	**NE.SC.HS-LS.**	**HS Life Sciences**
STRAND	**SC.HS.7.**	**Interdependent Relationships in Ecosystems**
INDICATOR	**SC.HS.7.2.**	**Gather, analyze, and communicate evidence of interdependent relationships in ecosystems.**
STRAND	SC.HS.7.2.E.	Design, evaluate, and refine a solution for increasing the positive impacts of human activities on the environment and biodiversity.

CONTENT STANDARD	**NE.SC.HS-ESS.**	**HS Earth and Space Sciences**
STRAND	**SC.HS.12.**	**Weather and Climate**
INDICATOR	**SC.HS.12.2.**	**Gather, analyze, and communicate evidence to support that Earth's climate and weather are influenced by energy flow through Earth systems.**
STRAND	SC.HS.12.2.B.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

CONTENT STANDARD	**NE.SC.HS-ESS.**	**HS Earth and Space Sciences**
STRAND	**SC.HS.15.**	**Sustainability**
INDICATOR	**SC.HS.15.5.**	**Gather, analyze, and communicate evidence to describe the interactions between society, environment, and economy.**
STRAND	SC.HS.15.5.A.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
STRAND	SC.HS.15.5.B.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.

STRAND	SC.HS.15.5.C.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
STRAND	SC.HS.15.5.D.	Evaluate or refine a technological solution that increases positive impacts of human activities on natural systems.
STRAND	SC.HS.15.5.E.	Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
STRAND	SC.HS.15.5.F.	Use a computational representation to illustrate the relationships among Earth systems and the degree to which those relationships are being modified due to human activity.
CONTENT STANDARD	**NE.SC.HS.P-P.**	**HS Physics – Plus Standards**
STRAND	**SC.HSP.4.**	**Energy: Physics**
INDICATOR	**SC.HSP.4.3.**	**Gather, analyze, and communicate evidence of the interactions of energy.**
STRAND	SC.HSP.4.3.C.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
STRAND	SC.HSP.4.3.D.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
CONTENT STANDARD	**NE.SC.HS.P-P.**	**HS Physics – Plus Standards**
STRAND	**SC.HSP.16.**	**Electricity and Magnetism**
INDICATOR	**SC.HSP.16.4.**	**Gather, analyze, and communicate evidence of electricity and magnetism.**
STRAND	SC.HSP.16.4.D.	Evaluate competing design solutions for construction and use of electrical consumer products accounting for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.
STRAND	SC.HSP.16.4.G.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
CONTENT STANDARD	**NE.SC.HS.P-C.**	**HS Chemistry – Plus Standards**
STRAND	**SC.HSP.3.**	**Structure and Properties of Matter**
INDICATOR	**SC.HSP.3.1.**	**Gather, analyze, and communicate evidence of the structure, properties, and interactions of matter.**
STRAND	SC.HSP.3.3.D.	Evaluate a solution to a complex, real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
CONTENT STANDARD	**NE.SC.HS.P-C.**	**HS Chemistry – Plus Standards**

STRAND	**SC.HSP.4.**	**Energy: Chemistry**
INDICATOR	**SC.HSP.4.2.**	**Gather, analyze, and communicate evidence of the interactions of energy.**
STRAND	SC.HSP.4.2.D.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

CONTENT STANDARD	**NE.SC.HSP-B.**	**HS Biology – Plus Standards**
STRAND	**SC.HSP.7.**	**Interdependent Relationships in Ecosystems**
INDICATOR	**SC.HSP.7.2.**	**Gather, analyze, and communicate evidence of interdependent relationships in ecosystems.**
STRAND	SC.HSP.7.2.D.	Design, evaluate, and refine a solution for increasing the positive impacts of human activities on the environment and biodiversity.

Nebraska Content Area Standards

Technology Education

Grade **11** - Adopted: **2018**

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

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

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

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

Nebraska Content Area Standards
Technology Education
Grade **12** - Adopted: **2018**

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

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

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

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

Nevada Academic Content Standards
Mathematics

Grade **11** - Adopted: **2010**

CONTENT STANDARD	NV.CC.MP.	Mathematical Practices
STRAND / INDICATOR	MP-1.	Make sense of problems and persevere in solving them.
STRAND / INDICATOR	MP-2.	Reason abstractly and quantitatively.
STRAND / INDICATOR	MP-3.	Construct viable arguments and critique the reasoning of others.
STRAND / INDICATOR	MP-4.	Model with mathematics.
STRAND / INDICATOR	MP-8.	Look for and express regularity in repeated reasoning.

CONTENT STANDARD	NV.CC.A.	Algebra
STRAND / INDICATOR	**A-CED.**	**Creating Equations**
INDICATOR / GRADE LEVEL EXPECTATION		**Create equations that describe numbers or relationships.**
GRADE LEVEL EXPECTATION	A-CED.2.	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

CONTENT STANDARD	NV.CC.A.	Algebra
STRAND / INDICATOR	**A-REI.**	**Reasoning with Equations and Inequalities**
INDICATOR / GRADE LEVEL EXPECTATION		**Understand solving equations as a process of reasoning and explain the reasoning.**
GRADE LEVEL EXPECTATION	A-REI.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

CONTENT STANDARD	NV.CC.F.	Functions
STRAND / INDICATOR	**F-IF.**	**Interpreting Functions**
INDICATOR / GRADE LEVEL EXPECTATION		**Analyze functions using different representations.**
GRADE LEVEL EXPECTATION	**F-IF.7.**	**Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.**
INDICATOR	F-IF.7(a)	Graph linear and quadratic functions and show intercepts, maxima, and minima.

CONTENT STANDARD	**NV.CC.F.**	**Functions**
STRAND / INDICATOR	**F-LE.**	**Linear and Exponential Models**
INDICATOR / GRADE LEVEL EXPECTATION		**Construct and compare linear and exponential models and solve problems.**
GRADE LEVEL EXPECTATION	**F-LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
INDICATOR	F-LE.1(a)	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

CONTENT STANDARD	**NV.CC.G.**	**Geometry**
STRAND / INDICATOR	**G-GPE.**	**Expressing Geometric Properties with Equations**
INDICATOR / GRADE LEVEL EXPECTATION		**Use coordinates to prove simple geometric theorems algebraically**
GRADE LEVEL EXPECTATION	G-GPE.5.	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

Nevada Academic Content Standards

Mathematics

Grade **12** - Adopted: **2010**

CONTENT STANDARD	**NV.CC.MP.**	**Mathematical Practices**
STRAND / INDICATOR	MP-1.	Make sense of problems and persevere in solving them.
STRAND / INDICATOR	MP-2.	Reason abstractly and quantitatively.
STRAND / INDICATOR	MP-3.	Construct viable arguments and critique the reasoning of others.
STRAND / INDICATOR	MP-4.	Model with mathematics.
STRAND / INDICATOR	MP-8.	Look for and express regularity in repeated reasoning.

CONTENT STANDARD	**NV.CC.A.**	**Algebra**
STRAND / INDICATOR	**A-CED.**	**Creating Equations**
INDICATOR / GRADE LEVEL EXPECTATION		**Create equations that describe numbers or relationships.**

GRADE LEVEL EXPECTATION	A-CED.2.	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

CONTENT STANDARD	**NV.CC.A.**	**Algebra**
STRAND / INDICATOR	**A-REI.**	**Reasoning with Equations and Inequalities**
INDICATOR / GRADE LEVEL EXPECTATION		**Understand solving equations as a process of reasoning and explain the reasoning.**
GRADE LEVEL EXPECTATION	A-REI.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

CONTENT STANDARD	**NV.CC.F.**	**Functions**
STRAND / INDICATOR	**F-IF.**	**Interpreting Functions**
INDICATOR / GRADE LEVEL EXPECTATION		**Analyze functions using different representations.**
GRADE LEVEL EXPECTATION	**F-IF.7.**	**Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.**
INDICATOR	F-IF.7(a)	Graph linear and quadratic functions and show intercepts, maxima, and minima.

CONTENT STANDARD	**NV.CC.F.**	**Functions**
STRAND / INDICATOR	**F-LE.**	**Linear and Exponential Models**
INDICATOR / GRADE LEVEL EXPECTATION		**Construct and compare linear and exponential models and solve problems.**
GRADE LEVEL EXPECTATION	**F-LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
INDICATOR	F-LE.1(a)	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

CONTENT STANDARD	**NV.CC.G.**	**Geometry**
STRAND / INDICATOR	**G-GPE.**	**Expressing Geometric Properties with Equations**
INDICATOR / GRADE LEVEL EXPECTATION		**Use coordinates to prove simple geometric theorems algebraically**
GRADE LEVEL EXPECTATION	G-GPE.5.	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

CONTENT STANDARD	**NV.HS-PS.**	**PHYSICAL SCIENCE**
STRAND / INDICATOR	**HS-PS1.**	**Matter and Its Interactions**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

CONTENT STANDARD	**NV.HS-PS.**	**PHYSICAL SCIENCE**
STRAND / INDICATOR	**HS-PS3.**	**Energy**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

CONTENT STANDARD	**NV.HS-PS.**	**PHYSICAL SCIENCE**
STRAND / INDICATOR	**HS-PS4.**	**Waves and Their Applications in Technologies for Information Transfer**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.

CONTENT STANDARD	**NV.HS-LS.**	**LIFE SCIENCE**
STRAND / INDICATOR	**HS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

CONTENT STANDARD	**NV.HS-ESS.**	**EARTH AND SPACE SCIENCE**
STRAND / INDICATOR	**HS-ESS2.**	**Earth's Systems**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

CONTENT STANDARD	**NV.HS-ESS.**	**EARTH AND SPACE SCIENCE**
STRAND / INDICATOR	**HS-ESS3.**	**Earth and Human Activity**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
GRADE LEVEL EXPECTATION	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
GRADE LEVEL EXPECTATION	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
GRADE LEVEL EXPECTATION	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
GRADE LEVEL EXPECTATION	HS-ESS3-6.	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
CONTENT STANDARD	**NV.HS-ETS.**	**ENGINEERING DESIGN**
STRAND / INDICATOR	**HS-ETS1.**	**Engineering Design**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-ETS1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
GRADE LEVEL EXPECTATION	HS-ETS1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
GRADE LEVEL EXPECTATION	HS-ETS1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Grade **11** - Adopted: **2010**

CONTENT STANDARD	**NV.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Key Ideas and Details**
INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.2.	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.3.	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

CONTENT STANDARD	**NV.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Craft and Structure**
INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.4.	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 11-12 texts and topics.
INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.6.	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.

CONTENT STANDARD	**NV.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Integration of Knowledge and Ideas**
INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.9.	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

CONTENT STANDARD	**NV.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Range of Reading and Level of Text Complexity**
INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.10.	By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.

CONTENT STANDARD	**NV.WHST.11-12.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Text Types and Purposes**
INDICATOR / GRADE LEVEL EXPECTATION	**WHST.11-12.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
GRADE LEVEL EXPECTATION	WHST.11-12.2(d)	Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.

CONTENT STANDARD	**NV.WHST.11-12.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Production and Distribution of Writing**
INDICATOR / GRADE LEVEL EXPECTATION	WHST.11-12.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

INDICATOR / GRADE LEVEL EXPECTATION	WHST.11-12.6.	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

Nevada Academic Content Standards

Science

Grade **12** - Adopted: **2014**

CONTENT STANDARD	**NV.HS-PS.**	**PHYSICAL SCIENCE**
STRAND / INDICATOR	**HS-PS1.**	**Matter and Its Interactions**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

CONTENT STANDARD	**NV.HS-PS.**	**PHYSICAL SCIENCE**
STRAND / INDICATOR	**HS-PS3.**	**Energy**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

CONTENT STANDARD	**NV.HS-PS.**	**PHYSICAL SCIENCE**
STRAND / INDICATOR	**HS-PS4.**	**Waves and Their Applications in Technologies for Information Transfer**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.

CONTENT STANDARD	**NV.HS-LS.**	**LIFE SCIENCE**
STRAND / INDICATOR	**HS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

CONTENT STANDARD	**NV.HS-ESS.**	**EARTH AND SPACE SCIENCE**
STRAND / INDICATOR	**HS-ESS2.**	**Earth's Systems**

INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
CONTENT STANDARD	**NV.HS-ESS.**	**EARTH AND SPACE SCIENCE**
STRAND / INDICATOR	**HS-ESS3.**	**Earth and Human Activity**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
GRADE LEVEL EXPECTATION	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
GRADE LEVEL EXPECTATION	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
GRADE LEVEL EXPECTATION	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
GRADE LEVEL EXPECTATION	HS-ESS3-6.	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
CONTENT STANDARD	**NV.HS-ETS.**	**ENGINEERING DESIGN**
STRAND / INDICATOR	**HS-ETS1.**	**Engineering Design**
INDICATOR / GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
GRADE LEVEL EXPECTATION	HS-ETS1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
GRADE LEVEL EXPECTATION	HS-ETS1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
GRADE LEVEL EXPECTATION	HS-ETS1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Grade **12** - Adopted: **2010**

CONTENT STANDARD	**NV.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Key Ideas and Details**

INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.2.	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.3.	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
CONTENT STANDARD	**NV.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Craft and Structure**
INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.4.	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 11-12 texts and topics.
INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
CONTENT STANDARD	**NV.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Integration of Knowledge and Ideas**
INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.9.	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
CONTENT STANDARD	**NV.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Range of Reading and Level of Text Complexity**
INDICATOR / GRADE LEVEL EXPECTATION	RST.11-12.10.	By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.
CONTENT STANDARD	**NV.WHST.11-12.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Text Types and Purposes**
INDICATOR / GRADE LEVEL EXPECTATION	**WHST.11-12.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
GRADE LEVEL EXPECTATION	WHST.11-12.2(d)	Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.
CONTENT STANDARD	**NV.WHST.11-12.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / INDICATOR		**Production and Distribution of Writing**

INDICATOR / GRADE LEVEL EXPECTATION	WHST.11-12.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
INDICATOR / GRADE LEVEL EXPECTATION	WHST.11-12.6.	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

Nevada Academic Content Standards

Technology Education

Grade **11** - Adopted: **2019**

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

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

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

CONTENT STANDARD		NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE

STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P5.**	**Creating Computational Artifacts**
GRADE LEVEL EXPECTATION	P5.1.	Plan the development of a computational artifact using an iterative process that includes reflection on and modification of the plan, taking into account key features, time and resource constraints, and user expectations.
GRADE LEVEL EXPECTATION	P5.2.	Create a computational artifact for practical intent, personal expression, or to address a societal issue.

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

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

CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE**
STRAND / INDICATOR		**Algorithms and Programming**
INDICATOR / GRADE LEVEL EXPECTATION	9-12.AP.A.1.	Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.

CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE**
STRAND / INDICATOR		**Impacts of Computing**
INDICATOR / GRADE LEVEL EXPECTATION	9-12.IC.C.2.	Test and refine computational artifacts to reduce bias and equity deficits.

CONTENT STANDARD		**Grades 9-12 Advanced Computer Science Standards**
STRAND / INDICATOR		**Algorithms and Programming**

INDICATOR / GRADE LEVEL EXPECTATION	A9-12.AP.A.3.	Use and adapt classic algorithms to solve computational problems.

CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY**
STRAND / INDICATOR		**Innovative Designer**
INDICATOR / GRADE LEVEL EXPECTATION	9-12.ID.B.1.	Creatively use digital tools to support a design process and expand their understanding to identify constraints, trade-offs, and to weigh risks.
INDICATOR / GRADE LEVEL EXPECTATION	9-12.ID.C.1.	Engage in a cyclical design process to inquire and analyze, develop ideas, test, and revise prototypes, presenting finished products and best practices learned during the development.
INDICATOR / GRADE LEVEL EXPECTATION	9-12.ID.D.1.	Demonstrate an ability to persevere and handle greater ambiguity as they work to solve open-ended problems.

CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY**
STRAND / INDICATOR		**Computational Thinker**
INDICATOR / GRADE LEVEL EXPECTATION	9-12.CT.A.1.	Define complex issues, create a plan, and select appropriate technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.
INDICATOR / GRADE LEVEL EXPECTATION	9-12.CT.C.1.	Collaborate to break problems into component parts, identify key pieces, and use that information to problem-solve.

Nevada Academic Content Standards

Technology Education

Grade **12** - Adopted: **2019**

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

CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE**
STRAND / INDICATOR		**Practices**

INDICATOR / GRADE LEVEL EXPECTATION	**P3.**	**Recognizing and Defining Computational Problems**
GRADE LEVEL EXPECTATION	P3.1.	Identify complex, interdisciplinary, real-world problems that can be solved computationally.
GRADE LEVEL EXPECTATION	P3.2.	Decompose complex real-world problems into manageable subproblems that could integrate existing solutions or procedures.
GRADE LEVEL EXPECTATION	P3.3.	Evaluate whether it is appropriate and feasible to solve a problem computationally.
CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE**
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P4.**	**Developing and Using Abstractions**
GRADE LEVEL EXPECTATION	P4.3.	Create modules and develop points of interaction that can apply to multiple situations and reduce complexity.
CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE**
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P5.**	**Creating Computational Artifacts**
GRADE LEVEL EXPECTATION	P5.1.	Plan the development of a computational artifact using an iterative process that includes reflection on and modification of the plan, taking into account key features, time and resource constraints, and user expectations.
GRADE LEVEL EXPECTATION	P5.2.	Create a computational artifact for practical intent, personal expression, or to address a societal issue.
CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE**
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P6.**	**Testing and Refining Computational Artifacts**
GRADE LEVEL EXPECTATION	P6.1.	Systematically test computational artifacts by considering all scenarios and using test cases.
CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE**
STRAND / INDICATOR		**Practices**
INDICATOR / GRADE LEVEL EXPECTATION	**P7.**	**Communicating About Computing**

GRADE LEVEL EXPECTATION	P7.1.	Select, organize, and interpret large data sets from multiple sources to support a claim.

CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE**
STRAND / INDICATOR		**Algorithms and Programming**
INDICATOR / GRADE LEVEL EXPECTATION	9-12.AP.A.1.	Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.

CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for COMPUTER SCIENCE**
STRAND / INDICATOR		**Impacts of Computing**
INDICATOR / GRADE LEVEL EXPECTATION	9-12.IC.C.2.	Test and refine computational artifacts to reduce bias and equity deficits.

CONTENT STANDARD		**Grades 9-12 Advanced Computer Science Standards**
STRAND / INDICATOR		**Algorithms and Programming**
INDICATOR / GRADE LEVEL EXPECTATION	A9-12.AP.A.3.	Use and adapt classic algorithms to solve computational problems.

CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY**
STRAND / INDICATOR		**Innovative Designer**
INDICATOR / GRADE LEVEL EXPECTATION	9-12.ID.B.1.	Creatively use digital tools to support a design process and expand their understanding to identify constraints, trade-offs, and to weigh risks.
INDICATOR / GRADE LEVEL EXPECTATION	9-12.ID.C.1.	Engage in a cyclical design process to inquire and analyze, develop ideas, test, and revise prototypes, presenting finished products and best practices learned during the development.
INDICATOR / GRADE LEVEL EXPECTATION	9-12.ID.D.1.	Demonstrate an ability to persevere and handle greater ambiguity as they work to solve open-ended problems.

CONTENT STANDARD		**NEVADA ACADEMIC CONTENT STANDARDS for INTEGRATED TECHNOLOGY**
STRAND / INDICATOR		**Computational Thinker**
INDICATOR / GRADE LEVEL EXPECTATION	9-12.CT.A.1.	Define complex issues, create a plan, and select appropriate technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.

INDICATOR / GRADE LEVEL EXPECTATION	9-12.CT.C.1.	Collaborate to break problems into component parts, identify key pieces, and use that information to problem-solve.

New Hampshire College and Career Ready Standards

Mathematics

Grade **11** - Adopted: **2010**

STRAND / STANDARD	NH.CC.MP.	Mathematical Practices
STANDARD / GLE	MP-1.	Make sense of problems and persevere in solving them.
STANDARD / GLE	MP-2.	Reason abstractly and quantitatively.
STANDARD / GLE	MP-3.	Construct viable arguments and critique the reasoning of others.
STANDARD / GLE	MP-4.	Model with mathematics.
STANDARD / GLE	MP-8.	Look for and express regularity in repeated reasoning.

STRAND / STANDARD	NH.CC.A.	Algebra
STANDARD / GLE	**A-CED.**	**Creating Equations**
GRADE LEVEL EXPECTATION		**Create equations that describe numbers or relationships.**
EXPECTATION	A-CED.2.	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

STRAND / STANDARD	NH.CC.A.	Algebra
STANDARD / GLE	**A-REI.**	**Reasoning with Equations and Inequalities**
GRADE LEVEL EXPECTATION		**Understand solving equations as a process of reasoning and explain the reasoning.**
EXPECTATION	A-REI.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

STRAND / STANDARD	NH.CC.F.	Functions
STANDARD / GLE	**F-IF.**	**Interpreting Functions**
GRADE LEVEL EXPECTATION		**Analyze functions using different representations.**

EXPECTATION	**F-IF.7.**	**Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.**
INDICATOR	F-IF.7(a)	Graph linear and quadratic functions and show intercepts, maxima, and minima.

STRAND / STANDARD	**NH.CC.F.**	**Functions**
STANDARD / GLE	**F-LE.**	**Linear and Exponential Models**
GRADE LEVEL EXPECTATION		**Construct and compare linear and exponential models and solve problems.**
EXPECTATION	**F-LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
INDICATOR	F-LE.1(a)	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

STRAND / STANDARD	**NH.CC.G.**	**Geometry**
STANDARD / GLE	**G-GPE.**	**Expressing Geometric Properties with Equations**
GRADE LEVEL EXPECTATION		**Use coordinates to prove simple geometric theorems algebraically**
EXPECTATION	G-GPE.5.	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

New Hampshire College and Career Ready Standards

Mathematics

Grade **12** - Adopted: **2010**

STRAND / STANDARD	**NH.CC.MP.**	**Mathematical Practices**
STANDARD / GLE	MP-1.	Make sense of problems and persevere in solving them.
STANDARD / GLE	MP-2.	Reason abstractly and quantitatively.
STANDARD / GLE	MP-3.	Construct viable arguments and critique the reasoning of others.
STANDARD / GLE	MP-4.	Model with mathematics.
STANDARD / GLE	MP-8.	Look for and express regularity in repeated reasoning.

STRAND / STANDARD	**NH.CC.A.**	**Algebra**
STANDARD / GLE	**A-CED.**	**Creating Equations**

GRADE LEVEL EXPECTATION		**Create equations that describe numbers or relationships.**
EXPECTATION	A-CED.2.	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
STRAND / STANDARD	**NH.CC.A.**	**Algebra**
STANDARD / GLE	**A-REI.**	**Reasoning with Equations and Inequalities**
GRADE LEVEL EXPECTATION		**Understand solving equations as a process of reasoning and explain the reasoning.**
EXPECTATION	A-REI.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
STRAND / STANDARD	**NH.CC.F.**	**Functions**
STANDARD / GLE	**F-IF.**	**Interpreting Functions**
GRADE LEVEL EXPECTATION		**Analyze functions using different representations.**
EXPECTATION	**F-IF.7.**	**Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.**
INDICATOR	F-IF.7(a)	Graph linear and quadratic functions and show intercepts, maxima, and minima.
STRAND / STANDARD	**NH.CC.F.**	**Functions**
STANDARD / GLE	**F-LE.**	**Linear and Exponential Models**
GRADE LEVEL EXPECTATION		**Construct and compare linear and exponential models and solve problems.**
EXPECTATION	**F-LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
INDICATOR	F-LE.1(a)	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
STRAND / STANDARD	**NH.CC.G.**	**Geometry**
STANDARD / GLE	**G-GPE.**	**Expressing Geometric Properties with Equations**
GRADE LEVEL EXPECTATION		**Use coordinates to prove simple geometric theorems algebraically**
EXPECTATION	G-GPE.5.	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

STRAND / STANDARD	NGSS.HS-PS.	PHYSICAL SCIENCE
STANDARD / GLE	HS-PS1.	Matter and Its Interactions
GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:
EXPECTATION	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

STRAND / STANDARD	NGSS.HS-PS.	PHYSICAL SCIENCE
STANDARD / GLE	HS-PS3.	Energy
GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:
EXPECTATION	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

STRAND / STANDARD	NGSS.HS-PS.	PHYSICAL SCIENCE
STANDARD / GLE	HS-PS4.	Waves and Their Applications in Technologies for Information Transfer
GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:
EXPECTATION	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.

STRAND / STANDARD	NGSS.HS-LS.	LIFE SCIENCE
STANDARD / GLE	HS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:
EXPECTATION	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

STRAND / STANDARD	NGSS.HS-ESS.	EARTH AND SPACE SCIENCE
STANDARD / GLE	HS-ESS2.	Earth's Systems
GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:
EXPECTATION	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

STRAND / STANDARD	NGSS.HS-ESS.	EARTH AND SPACE SCIENCE
STANDARD / GLE	HS-ESS3.	Earth and Human Activity

GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:
EXPECTATION	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
EXPECTATION	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
EXPECTATION	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
EXPECTATION	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
EXPECTATION	HS-ESS3-6.	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
STRAND / STANDARD	**NGSS.HS-ETS.**	**ENGINEERING DESIGN**
STANDARD / GLE	**HS-ETS1.**	**Engineering Design**
GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
EXPECTATION	HS-ETS1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
EXPECTATION	HS-ETS1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
EXPECTATION	HS-ETS1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

New Hampshire College and Career Ready Standards

Science

Grade **12** - Adopted: **2016**

STRAND / STANDARD	NGSS.HS-PS.	PHYSICAL SCIENCE
STANDARD / GLE	**HS-PS1.**	**Matter and Its Interactions**
GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
EXPECTATION	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.
STRAND / STANDARD	**NGSS.HS-PS.**	**PHYSICAL SCIENCE**
STANDARD / GLE	**HS-PS3.**	**Energy**
GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**

EXPECTATION	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

STRAND / STANDARD	**NGSS.HS-PS.**	**PHYSICAL SCIENCE**
STANDARD / GLE	**HS-PS4.**	**Waves and Their Applications in Technologies for Information Transfer**
GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
EXPECTATION	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.

STRAND / STANDARD	**NGSS.HS-LS.**	**LIFE SCIENCE**
STANDARD / GLE	**HS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
EXPECTATION	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

STRAND / STANDARD	**NGSS.HS-ESS.**	**EARTH AND SPACE SCIENCE**
STANDARD / GLE	**HS-ESS2.**	**Earth's Systems**
GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
EXPECTATION	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

STRAND / STANDARD	**NGSS.HS-ESS.**	**EARTH AND SPACE SCIENCE**
STANDARD / GLE	**HS-ESS3.**	**Earth and Human Activity**
GRADE LEVEL EXPECTATION		**Students who demonstrate understanding can:**
EXPECTATION	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
EXPECTATION	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
EXPECTATION	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
EXPECTATION	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

EXPECTATION	HS-ESS3-6.	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

STRAND / STANDARD	NGSS.HS-ETS.	ENGINEERING DESIGN
STANDARD / GLE	HS-ETS1.	Engineering Design
GRADE LEVEL EXPECTATION		Students who demonstrate understanding can:
EXPECTATION	HS-ETS1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
EXPECTATION	HS-ETS1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
EXPECTATION	HS-ETS1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

New Hampshire College and Career Ready Standards

Technology Education

Grade **11** - Adopted: **2005**

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

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

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

Grade **11** - Adopted: **2018**

STRAND / STANDARD		Computer Science
STANDARD / GLE		Algorithms & Programming

GRADE LEVEL EXPECTATION	3B-AP-09.	Implement an artificial intelligence algorithm to play a game against a human opponent or solve a problem.
GRADE LEVEL EXPECTATION	3B-AP-10.	Use and adapt classic algorithms to solve computational problems.
GRADE LEVEL EXPECTATION	3B-AP-14.	Construct solutions to problems using student-created components, such as procedures, modules and/or objects.

New Hampshire College and Career Ready Standards

Technology Education

Grade **12** - Adopted: **2005**

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

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

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

Grade **12** - Adopted: **2018**

STRAND / STANDARD		Computer Science
STANDARD / GLE		Algorithms & Programming
GRADE LEVEL EXPECTATION	3B-AP-09.	Implement an artificial intelligence algorithm to play a game against a human opponent or solve a problem.
GRADE LEVEL EXPECTATION	3B-AP-10.	Use and adapt classic algorithms to solve computational problems.
GRADE LEVEL EXPECTATION	3B-AP-14.	Construct solutions to problems using student-created components, such as procedures, modules and/or objects.

New Jersey Student Learning Standards

Mathematics

Grade **11** - 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.8.	Look for and express regularity in repeated reasoning.

CONTENT AREA / STANDARD	NJ.A.	Algebra
STRAND	**A-CED.**	**Creating Equations**
CONTENT STATEMENT	**A-CED.A.**	**Create equations that describe numbers or relationships**
CUMULATIVE PROGRESS INDICATOR	A-CED.A.2.	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

CONTENT AREA / STANDARD	NJ.A.	Algebra
STRAND	**A-REI.**	**Reasoning with Equations and Inequalities**
CONTENT STATEMENT	**A-REI.A.**	**Understand solving equations as a process of reasoning and explain the reasoning**
CUMULATIVE PROGRESS INDICATOR	A-REI.A.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

CONTENT AREA / STANDARD	NJ.F.	Functions
STRAND	**F-IF.**	**Interpreting Functions**
CONTENT STATEMENT	**F-IF.C.**	**Analyze functions using different representations**
CUMULATIVE PROGRESS INDICATOR	**F-IF.C.7.**	**Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.**
INDICATOR	F-IF.C.7.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima.

CONTENT AREA / STANDARD	NJ.F.	Functions
STRAND	**F-LE.**	**Linear and Exponential Models**

CONTENT STATEMENT	**F-LE.A.**	**Construct and compare linear and exponential models and solve problems**
CUMULATIVE PROGRESS INDICATOR	**F-LE.A.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
INDICATOR	F-LE.A.1.a.	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

New Jersey Student Learning Standards

Mathematics

Grade **12** - 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.8.	Look for and express regularity in repeated reasoning.
CONTENT AREA / STANDARD	**NJ.A.**	**Algebra**
STRAND	**A-CED.**	**Creating Equations**
CONTENT STATEMENT	**A-CED.A.**	**Create equations that describe numbers or relationships**
CUMULATIVE PROGRESS INDICATOR	A-CED.A.2.	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
CONTENT AREA / STANDARD	**NJ.A.**	**Algebra**
STRAND	**A-REI.**	**Reasoning with Equations and Inequalities**
CONTENT STATEMENT	**A-REI.A.**	**Understand solving equations as a process of reasoning and explain the reasoning**
CUMULATIVE PROGRESS INDICATOR	A-REI.A.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
CONTENT AREA / STANDARD	**NJ.F.**	**Functions**
STRAND	**F-IF.**	**Interpreting Functions**
CONTENT STATEMENT	**F-IF.C.**	**Analyze functions using different representations**

CUMULATIVE PROGRESS INDICATOR	**F-IF.C.7.**	**Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.**
INDICATOR	F-IF.C.7.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima.

CONTENT AREA / STANDARD	**NJ.F.**	**Functions**
STRAND	**F-LE.**	**Linear and Exponential Models**
CONTENT STATEMENT	**F-LE.A.**	**Construct and compare linear and exponential models and solve problems**
CUMULATIVE PROGRESS INDICATOR	**F-LE.A.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
INDICATOR	F-LE.A.1.a.	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

New Jersey Student Learning Standards

Science

Grade **11** - Adopted: **2020/Effective 2021**

CONTENT AREA / STANDARD	**HS-PS.**	**Physical Science**
STRAND	**HS-PS1:**	**Matter and its Interactions**
CONTENT STATEMENT	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

CONTENT AREA / STANDARD	**HS-PS.**	**Physical Science**
STRAND	**HS-PS3:**	**Energy**
CONTENT STATEMENT	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

CONTENT AREA / STANDARD	**HS-PS.**	**Physical Science**
STRAND	**HS-PS4:**	**Waves and Their Applications in Technologies for Information Transfer**
CONTENT STATEMENT	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.

CONTENT AREA / STANDARD	**HS-LS.**	**Life Science**
STRAND	**HS-LS2:**	**Ecosystems: Interactions, Energy, and Dynamics**
CONTENT STATEMENT	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

CONTENT AREA / STANDARD	**HS-ESS.**	**Earth and Space Science**
STRAND	**HS-ESS2:**	**Earth's Systems**
CONTENT STATEMENT	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

CONTENT AREA / STANDARD	**HS-ESS.**	**Earth and Space Science**
STRAND	**HS-ESS3:**	**Earth and Human Activity**
CONTENT STATEMENT	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and climate change have influenced human activity.
CONTENT STATEMENT	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
CONTENT STATEMENT	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
CONTENT STATEMENT	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on climate change and other natural systems.
CONTENT STATEMENT	HS-ESS3-6.	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity (i.e., climate change).

CONTENT AREA / STANDARD	**HS-ETS.**	**Engineering, Technology and Applications of Science**
STRAND	**HS-ETS1:**	**Engineering Design**
CONTENT STATEMENT	HS-ETS1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
CONTENT STATEMENT	HS-ETS1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
CONTENT STATEMENT	HS-ETS1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

New Jersey Student Learning Standards

Science

Grade **12** - Adopted: **2020/Effective 2021**

CONTENT AREA / STANDARD	**HS-PS.**	**Physical Science**
STRAND	**HS-PS1:**	**Matter and its Interactions**

CONTENT STATEMENT	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.
CONTENT AREA / STANDARD	**HS-PS.**	**Physical Science**
STRAND	**HS-PS3:**	**Energy**
CONTENT STATEMENT	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
CONTENT AREA / STANDARD	**HS-PS.**	**Physical Science**
STRAND	**HS-PS4:**	**Waves and Their Applications in Technologies for Information Transfer**
CONTENT STATEMENT	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.
CONTENT AREA / STANDARD	**HS-LS.**	**Life Science**
STRAND	**HS-LS2:**	**Ecosystems: Interactions, Energy, and Dynamics**
CONTENT STATEMENT	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
CONTENT AREA / STANDARD	**HS-ESS.**	**Earth and Space Science**
STRAND	**HS-ESS2:**	**Earth's Systems**
CONTENT STATEMENT	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
CONTENT AREA / STANDARD	**HS-ESS.**	**Earth and Space Science**
STRAND	**HS-ESS3:**	**Earth and Human Activity**
CONTENT STATEMENT	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and climate change have influenced human activity.
CONTENT STATEMENT	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
CONTENT STATEMENT	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
CONTENT STATEMENT	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on climate change and other natural systems.

CONTENT STATEMENT	HS-ESS3-6.	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity (i.e., climate change).
CONTENT AREA / STANDARD	**HS-ETS.**	**Engineering, Technology and Applications of Science**
STRAND	**HS-ETS1:**	**Engineering Design**
CONTENT STATEMENT	HS-ETS1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
CONTENT STATEMENT	HS-ETS1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
CONTENT STATEMENT	HS-ETS1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

New Jersey Student Learning Standards

Technology Education

Grade **11** - Adopted: **2020**

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

STRAND		**4 Developing and Using Abstractions**
CONTENT STATEMENT		**Abstractions are formed by identifying patterns and extracting common features from specific examples in order to create generalizations. Using generalized solutions and parts of solutions designed for broad reuse simplifies the development process by managing complexity. When engaging in this practice, students:**
CUMULATIVE PROGRESS INDICATOR		Evaluate existing technological functionalities and incorporate them into new designs.
CUMULATIVE PROGRESS INDICATOR		Create modules and develop points of interaction that can apply to multiple situations and reduce complexity.
CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**5 Creating Computational Artifacts**
CONTENT STATEMENT		**The process of developing computational artifacts embraces both creative expression and the exploration of ideas to create prototypes and solve computational problems. Students create artifacts that are personally relevant or beneficial to their community and beyond. Computational artifacts can be created by combining and modifying existing artifacts or by developing new artifacts. Examples of computational artifacts include programs, simulations, visualizations, digital animations, robotic systems, and apps. When engaging in this practice, students:**
CUMULATIVE PROGRESS INDICATOR		Plan the development of a computational artifact using an iterative process that includes reflection on and modification of the plan, taking into account key features, time and resource constraints, and user expectations.
CUMULATIVE PROGRESS INDICATOR		Create a computational artifact for practical intent, personal expression, or to address a societal issue.
CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**6 Testing and Refining Computational Artifacts**
CONTENT STATEMENT		**Testing and refinement is the deliberate and iterative process of improving a computational artifact. This process includes debugging (identifying and fixing errors) and comparing actual outcomes to intended outcomes. Students also respond to the changing needs and expectations of end users and improve the performance, reliability, usability, and accessibility of artifacts. When engaging in this practice, students:**
CUMULATIVE PROGRESS INDICATOR		Systematically test computational artifacts by considering all scenarios and using test cases.
CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Impacts of Computing**
CONTENT STATEMENT		**The design and use of computing technologies and artifacts can positively or negatively affect equitable access to information and opportunities.**
CUMULATIVE PROGRESS INDICATOR	8.1.12.IC.2:	Test and refine computational artifacts to reduce bias and equity deficits.

CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Algorithms & Programming**
CONTENT STATEMENT		**Individuals evaluate and select algorithms based on performance, reusability, and ease of implementation.**
CUMULATIVE PROGRESS INDICATOR	8.1.12.AP.1:	Design algorithms to solve computational problems using a combination of original and existing algorithms.

CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Algorithms & Programming**
CONTENT STATEMENT		**Complex programs are developed, tested, and analyzed by teams drawing on the members' diverse strengths using a variety of resources, libraries, and tools.**
CUMULATIVE PROGRESS INDICATOR	8.1.12.AP.9:	Collaboratively document and present design decisions in the development of complex programs.

CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Engineering Design**
CONTENT STATEMENT		**Engineering design is a complex process in which creativity, content knowledge, research, and analysis are used to address local and global problems. Decisions on trade-offs involve systematic comparisons of all costs and benefits, and final steps that may involve redesigning for optimization.**
CUMULATIVE PROGRESS INDICATOR	8.2.12.ED.1:	Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers.
CUMULATIVE PROGRESS INDICATOR	8.2.12.ED.4:	Design a product or system that addresses a global problem and document decisions made based on research, constraints, trade-offs, and aesthetic and ethical considerations and share this information with an appropriate audience.

CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Engineering Design**
CONTENT STATEMENT		**Engineering design evaluation, a process for determining how well a solution meets requirements, involves systematic comparisons between requirements, specifications, and constraints.**
CUMULATIVE PROGRESS INDICATOR	8.2.12.ED.5:	Evaluate the effectiveness of a product or system based on factors that are related to its requirements, specifications, and constraints (e.g., safety, reliability, economic considerations, quality control, environmental concerns, manufacturability, maintenance and repair, ergonomics).
CUMULATIVE PROGRESS INDICATOR	8.2.12.ED.6:	Analyze the effects of changing resources when designing a specific product or system (e.g., materials, energy, tools, capital, labor).

CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Interaction of Technology and Humans**
CONTENT STATEMENT		**Decisions to develop new technology are driven by societal and cultural opinions and demands that differ from culture to culture.**
CUMULATIVE PROGRESS INDICATOR	8.2.12.ITH.1:	Analyze a product to determine the impact that economic, political, social, and/or cultural factors have had on its design, including its design constraints.

New Jersey Student Learning Standards

Technology Education

Grade **12** - Adopted: **2020**

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

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

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

CUMULATIVE PROGRESS INDICATOR		Create modules and develop points of interaction that can apply to multiple situations and reduce complexity.

CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**5 Creating Computational Artifacts**
CONTENT STATEMENT		**The process of developing computational artifacts embraces both creative expression and the exploration of ideas to create prototypes and solve computational problems. Students create artifacts that are personally relevant or beneficial to their community and beyond. Computational artifacts can be created by combining and modifying existing artifacts or by developing new artifacts. Examples of computational artifacts include programs, simulations, visualizations, digital animations, robotic systems, and apps. When engaging in this practice, students:**

CUMULATIVE PROGRESS INDICATOR		Plan the development of a computational artifact using an iterative process that includes reflection on and modification of the plan, taking into account key features, time and resource constraints, and user expectations.

CUMULATIVE PROGRESS INDICATOR		Create a computational artifact for practical intent, personal expression, or to address a societal issue.

CONTENT AREA / STANDARD		**Computer Science and Design Thinking Practices**
STRAND		**6 Testing and Refining Computational Artifacts**
CONTENT STATEMENT		**Testing and refinement is the deliberate and iterative process of improving a computational artifact. This process includes debugging (identifying and fixing errors) and comparing actual outcomes to intended outcomes. Students also respond to the changing needs and expectations of end users and improve the performance, reliability, usability, and accessibility of artifacts. When engaging in this practice, students:**

CUMULATIVE PROGRESS INDICATOR		Systematically test computational artifacts by considering all scenarios and using test cases.

CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Impacts of Computing**
CONTENT STATEMENT		**The design and use of computing technologies and artifacts can positively or negatively affect equitable access to information and opportunities.**

CUMULATIVE PROGRESS INDICATOR	8.1.12.IC.2:	Test and refine computational artifacts to reduce bias and equity deficits.

CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Algorithms & Programming**
CONTENT STATEMENT		**Individuals evaluate and select algorithms based on performance, reusability, and ease of implementation.**

CUMULATIVE PROGRESS INDICATOR	8.1.12.AP.1:	Design algorithms to solve computational problems using a combination of original and existing algorithms.

CONTENT AREA / STANDARD	**8.1.**	**Computer Science and Design Thinking – Computer Science**
STRAND		**Algorithms & Programming**
CONTENT STATEMENT		**Complex programs are developed, tested, and analyzed by teams drawing on the members' diverse strengths using a variety of resources, libraries, and tools.**

CUMULATIVE PROGRESS INDICATOR	8.1.12.AP.9:	Collaboratively document and present design decisions in the development of complex programs.

CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Engineering Design**
CONTENT STATEMENT		**Engineering design is a complex process in which creativity, content knowledge, research, and analysis are used to address local and global problems. Decisions on trade-offs involve systematic comparisons of all costs and benefits, and final steps that may involve redesigning for optimization.**

CUMULATIVE PROGRESS INDICATOR	8.2.12.ED.1:	Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers.

CUMULATIVE PROGRESS INDICATOR	8.2.12.ED.4:	Design a product or system that addresses a global problem and document decisions made based on research, constraints, trade-offs, and aesthetic and ethical considerations and share this information with an appropriate audience.

CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Engineering Design**
CONTENT STATEMENT		**Engineering design evaluation, a process for determining how well a solution meets requirements, involves systematic comparisons between requirements, specifications, and constraints.**

CUMULATIVE PROGRESS INDICATOR	8.2.12.ED.5:	Evaluate the effectiveness of a product or system based on factors that are related to its requirements, specifications, and constraints (e.g., safety, reliability, economic considerations, quality control, environmental concerns, manufacturability, maintenance and repair, ergonomics).

CUMULATIVE PROGRESS INDICATOR	8.2.12.ED.6:	Analyze the effects of changing resources when designing a specific product or system (e.g., materials, energy, tools, capital, labor).

CONTENT AREA / STANDARD	**8.2.**	**Computer Science and Design Thinking – Design Thinking**
STRAND		**Interaction of Technology and Humans**
CONTENT STATEMENT		**Decisions to develop new technology are driven by societal and cultural opinions and demands that differ from culture to culture.**

CUMULATIVE PROGRESS INDICATOR	8.2.12.ITH.1:	Analyze a product to determine the impact that economic, political, social, and/or cultural factors have had on its design, including its design constraints.

New Mexico Content Standards

Mathematics

Grade **11** - 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.8.	Look for and express regularity in repeated reasoning.

STRAND / CONTENT STANDARD	NM.A.	Algebra
BENCHMARK / STANDARD	**A-CED.**	**Creating Equations**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Create equations that describe numbers or relationships.**
PERFORMANCE STANDARD / INDICATOR	A-CED.2.	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

STRAND / CONTENT STANDARD	NM.A.	Algebra
BENCHMARK / STANDARD	**A-REI.**	**Reasoning with Equations and Inequalities**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Understand solving equations as a process of reasoning and explain the reasoning.**
PERFORMANCE STANDARD / INDICATOR	A-REI.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

STRAND / CONTENT STANDARD	NM.F.	Functions

BENCHMARK / STANDARD	**F-IF.**	**Interpreting Functions**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Analyze functions using different representations.**
PERFORMANCE STANDARD / INDICATOR	**F-IF.7.**	**Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.**
INDICATOR	F-IF.7(a)	Graph linear and quadratic functions and show intercepts, maxima, and minima.

STRAND / CONTENT STANDARD	**NM.F.**	**Functions**
BENCHMARK / STANDARD	**F-LE.**	**Linear, Quadratic, and Exponential Models**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Construct and compare linear and exponential models and solve problems.**
PERFORMANCE STANDARD / INDICATOR	**F-LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
INDICATOR	F-LE.1(a)	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

STRAND / CONTENT STANDARD	**NM.G.**	**Geometry**
BENCHMARK / STANDARD	**G-GPE.**	**Expressing Geometric Properties with Equations**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Use coordinates to prove simple geometric theorems algebraically**
PERFORMANCE STANDARD / INDICATOR	G-GPE.5.	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

New Mexico Content Standards

Mathematics

Grade **12** - 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.8.	Look for and express regularity in repeated reasoning.

STRAND / CONTENT STANDARD	**NM.A.**	**Algebra**
BENCHMARK / STANDARD	**A-CED.**	**Creating Equations**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Create equations that describe numbers or relationships.**
PERFORMANCE STANDARD / INDICATOR	A-CED.2.	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

STRAND / CONTENT STANDARD	**NM.A.**	**Algebra**
BENCHMARK / STANDARD	**A-REI.**	**Reasoning with Equations and Inequalities**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Understand solving equations as a process of reasoning and explain the reasoning.**
PERFORMANCE STANDARD / INDICATOR	A-REI.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

STRAND / CONTENT STANDARD	**NM.F.**	**Functions**
BENCHMARK / STANDARD	**F-IF.**	**Interpreting Functions**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Analyze functions using different representations.**
PERFORMANCE STANDARD / INDICATOR	**F-IF.7.**	**Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.**
INDICATOR	F-IF.7(a)	Graph linear and quadratic functions and show intercepts, maxima, and minima.

STRAND / CONTENT STANDARD	**NM.F.**	**Functions**
BENCHMARK / STANDARD	**F-LE.**	**Linear, Quadratic, and Exponential Models**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Construct and compare linear and exponential models and solve problems.**

PERFORMANCE STANDARD / INDICATOR	**F-LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
INDICATOR	F-LE.1(a)	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

STRAND / CONTENT STANDARD	**NM.G.**	**Geometry**
BENCHMARK / STANDARD	**G-GPE.**	**Expressing Geometric Properties with Equations**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Use coordinates to prove simple geometric theorems algebraically**
PERFORMANCE STANDARD / INDICATOR	G-GPE.5.	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

New Mexico Content Standards

Science

Grade **11** - Adopted: **2013**

STRAND / CONTENT STANDARD	**NGSS.HS-PS.**	**PHYSICAL SCIENCE**
BENCHMARK / STANDARD	**HS-PS1.**	**Matter and Its Interactions**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

STRAND / CONTENT STANDARD	**NGSS.HS-PS.**	**PHYSICAL SCIENCE**
BENCHMARK / STANDARD	**HS-PS3.**	**Energy**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

STRAND / CONTENT STANDARD	**NGSS.HS-PS.**	**PHYSICAL SCIENCE**
BENCHMARK / STANDARD	**HS-PS4.**	**Waves and Their Applications in Technologies for Information Transfer**

PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.
STRAND / CONTENT STANDARD	**NGSS.HS-LS.**	**LIFE SCIENCE**
BENCHMARK / STANDARD	**HS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
STRAND / CONTENT STANDARD	**NGSS.HS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK / STANDARD	**HS-ESS2.**	**Earth's Systems**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
STRAND / CONTENT STANDARD	**NGSS.HS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK / STANDARD	**HS-ESS3.**	**Earth and Human Activity**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
PERFORMANCE STANDARD / INDICATOR	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
PERFORMANCE STANDARD / INDICATOR	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.

PERFORMANCE STANDARD / INDICATOR	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
PERFORMANCE STANDARD / INDICATOR	HS-ESS3-6.	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

STRAND / CONTENT STANDARD	**NGSS.HS-ETS.**	**ENGINEERING DESIGN**
BENCHMARK / STANDARD	**HS-ETS1.**	**Engineering Design**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	HS-ETS1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
PERFORMANCE STANDARD / INDICATOR	HS-ETS1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
PERFORMANCE STANDARD / INDICATOR	HS-ETS1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

STRAND / CONTENT STANDARD	**NM.SS.**	**SCIENCE AND SOCIETY**
BENCHMARK / STANDARD	**HS-SS.**	**Science and Society**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	HS-SS-1 NM.	Obtain and communicate information about the role of New Mexico in nuclear science and 21st century innovations including how the national laboratories have contributed to theoretical, experimental, and applied science; have illustrated the interdependence of science, engineering, and technology; and have used systems involving hardware, software, production, simulation, and information flow.

New Mexico Content Standards

Science

Grade **12** - Adopted: **2013**

STRAND / CONTENT STANDARD	**NGSS.HS-PS.**	**PHYSICAL SCIENCE**
BENCHMARK / STANDARD	**HS-PS1.**	**Matter and Its Interactions**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**

PERFORMANCE STANDARD / INDICATOR	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

STRAND / CONTENT STANDARD	**NGSS.HS-PS.**	**PHYSICAL SCIENCE**
BENCHMARK / STANDARD	**HS-PS3.**	**Energy**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**

PERFORMANCE STANDARD / INDICATOR	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

STRAND / CONTENT STANDARD	**NGSS.HS-PS.**	**PHYSICAL SCIENCE**
BENCHMARK / STANDARD	**HS-PS4.**	**Waves and Their Applications in Technologies for Information Transfer**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**

PERFORMANCE STANDARD / INDICATOR	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.

STRAND / CONTENT STANDARD	**NGSS.HS-LS.**	**LIFE SCIENCE**
BENCHMARK / STANDARD	**HS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**

PERFORMANCE STANDARD / INDICATOR	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

STRAND / CONTENT STANDARD	**NGSS.HS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK / STANDARD	**HS-ESS2.**	**Earth's Systems**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**

PERFORMANCE STANDARD / INDICATOR	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

STRAND / CONTENT STANDARD	**NGSS.HS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK / STANDARD	**HS-ESS3.**	**Earth and Human Activity**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
PERFORMANCE STANDARD / INDICATOR	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
PERFORMANCE STANDARD / INDICATOR	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
PERFORMANCE STANDARD / INDICATOR	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
PERFORMANCE STANDARD / INDICATOR	HS-ESS3-6.	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

STRAND / CONTENT STANDARD	**NGSS.HS-ETS.**	**ENGINEERING DESIGN**
BENCHMARK / STANDARD	**HS-ETS1.**	**Engineering Design**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	HS-ETS1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
PERFORMANCE STANDARD / INDICATOR	HS-ETS1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
PERFORMANCE STANDARD / INDICATOR	HS-ETS1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

STRAND / CONTENT STANDARD	**NM.SS.**	**SCIENCE AND SOCIETY**
BENCHMARK / STANDARD	**HS-SS.**	**Science and Society**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY		**Students who demonstrate understanding can:**
PERFORMANCE STANDARD / INDICATOR	HS-SS-1 NM.	Obtain and communicate information about the role of New Mexico in nuclear science and 21st century innovations including how the national laboratories have contributed to theoretical, experimental, and applied science; have illustrated the interdependence of science, engineering, and technology; and have used systems involving hardware, software, production, simulation, and information flow.

New Mexico Content Standards

Technology Education

Grade **11** - Adopted: **2019**

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.3 B.**	**Level 3B (Ages 17-18)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**3B-AP.**	**Algorithms & Programming**
PERFORMANCE STANDARD / INDICATOR		**Algorithms**
INDICATOR	3B-AP-09.	Implement an artificial intelligence algorithm to play a game against a human opponent or solve a problem. (P5.3)
INDICATOR	3B-AP-10.	Use and adapt classic algorithms to solve computational problems. (P4.2)

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.3 B.**	**Level 3B (Ages 17-18)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**3B-AP.**	**Algorithms & Programming**
PERFORMANCE STANDARD / INDICATOR		**Modularity**
INDICATOR	3B-AP-14.	Construct solutions to problems using student-created components, such as procedures, modules and/or objects. (P5.2)

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.3 B.**	**Level 3B (Ages 17-18)**

PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**3B-AP.**	**Algorithms & Programming**
PERFORMANCE STANDARD / INDICATOR		**Program Development**
INDICATOR	3B-AP-17.	Plan and develop programs for broad audiences using a software life cycle process. (P5.1)

New Mexico Content Standards

Technology Education

Grade **12** - Adopted: **2019**

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.3B.**	**Level 3B (Ages 17-18)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**3B-AP.**	**Algorithms & Programming**
PERFORMANCE STANDARD / INDICATOR		**Algorithms**
INDICATOR	3B-AP-09.	Implement an artificial intelligence algorithm to play a game against a human opponent or solve a problem. (P5.3)
INDICATOR	3B-AP-10.	Use and adapt classic algorithms to solve computational problems. (P4.2)

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.3B.**	**Level 3B (Ages 17-18)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**3B-AP.**	**Algorithms & Programming**
PERFORMANCE STANDARD / INDICATOR		**Modularity**
INDICATOR	3B-AP-14.	Construct solutions to problems using student-created components, such as procedures, modules and/or objects. (P5.2)

STRAND / CONTENT STANDARD		**CSTA K-12 Computer Science Standards**
BENCHMARK / STANDARD	**CSTA.3B.**	**Level 3B (Ages 17-18)**
PERFORMANCE STANDARD / BENCHMARK / PROFICIENCY	**3B-AP.**	**Algorithms & Programming**

PERFORMANCE STANDARD / INDICATOR		Program Development
INDICATOR	3B-AP-17.	Plan and develop programs for broad audiences using a software life cycle process. (P5.1)

New York State Learning Standards and Core Curriculum

Mathematics

Grade **11** - Adopted: **2017/Updated 2019**

STRAND / DOMAIN / UNIFYING THEME		Mathematical Practices
CATEGORY / CLUSTER / KEY IDEA	MP.1	Make sense of problems and persevere in solving them.
CATEGORY / CLUSTER / KEY IDEA	MP.2	Reason abstractly and quantitatively.
CATEGORY / CLUSTER / KEY IDEA	MP.3	Construct viable arguments and critique the reasoning of others.
CATEGORY / CLUSTER / KEY IDEA	MP.4	Model with mathematics.
CATEGORY / CLUSTER / KEY IDEA	MP.8	Look for and express regularity in repeated reasoning.

STRAND / DOMAIN / UNIFYING THEME		Algebra I
CATEGORY / CLUSTER / KEY IDEA	**AI-A.REI.**	**Algebra - Reasoning with Equations and Inequalities**
STANDARD / CONCEPTUAL UNDERSTANDING		**Understand solving equations as a process of reasoning and explain the reasoning.**
EXPECTATION / CONTENT SPECIFICATION	AI-A.REI.1a.	Explain each step when solving a linear or quadratic equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

STRAND / DOMAIN / UNIFYING THEME		Algebra I
CATEGORY / CLUSTER / KEY IDEA	**AI-F.IF.**	**Functions - Interpreting Functions**

STANDARD / CONCEPTUAL UNDERSTANDING		**Analyze functions using different representations.**
EXPECTATION / CONTENT SPECIFICATION	**AI-F.IF.7.**	**Graph functions and show key features of the graph by hand and by using technology where appropriate. (Shared standard with Algebra II)**
GRADE EXPECTATION	AI-F.IF.7.a.	Graph linear, quadratic, and exponential functions and show key features.
STRAND / DOMAIN / UNIFYING THEME		**Algebra II**
CATEGORY / CLUSTER / KEY IDEA	**AII-A.REI.**	**Algebra - Reasoning with Equations and Inequalities**
STANDARD / CONCEPTUAL UNDERSTANDING		**Understand solving equations as a process of reasoning and explain the reasoning.**
EXPECTATION / CONTENT SPECIFICATION	AII-A.REI.1b.	Explain each step when solving rational or radical equations as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

New York State Learning Standards and Core Curriculum

Mathematics

Grade **12** - Adopted: **2017/Updated 2019**

STRAND / DOMAIN / UNIFYING THEME		**Mathematical Practices**
CATEGORY / CLUSTER / KEY IDEA	MP.1	Make sense of problems and persevere in solving them.
CATEGORY / CLUSTER / KEY IDEA	MP.2	Reason abstractly and quantitatively.
CATEGORY / CLUSTER / KEY IDEA	MP.3	Construct viable arguments and critique the reasoning of others.
CATEGORY / CLUSTER / KEY IDEA	MP.4	Model with mathematics.
CATEGORY / CLUSTER / KEY IDEA	MP.8	Look for and express regularity in repeated reasoning.
STRAND / DOMAIN / UNIFYING THEME		**Algebra I**

CATEGORY / CLUSTER / KEY IDEA	**AI-A.REI.**	**Algebra - Reasoning with Equations and Inequalities**
STANDARD / CONCEPTUAL UNDERSTANDING		**Understand solving equations as a process of reasoning and explain the reasoning.**
EXPECTATION / CONTENT SPECIFICATION	AI-A.REI.1a.	Explain each step when solving a linear or quadratic equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
STRAND / DOMAIN / UNIFYING THEME		**Algebra I**
CATEGORY / CLUSTER / KEY IDEA	**AI-F.IF.**	**Functions - Interpreting Functions**
STANDARD / CONCEPTUAL UNDERSTANDING		**Analyze functions using different representations.**
EXPECTATION / CONTENT SPECIFICATION	**AI-F.IF.7.**	**Graph functions and show key features of the graph by hand and by using technology where appropriate. (Shared standard with Algebra II)**
GRADE EXPECTATION	AI-F.IF.7.a.	Graph linear, quadratic, and exponential functions and show key features.
STRAND / DOMAIN / UNIFYING THEME		**Algebra II**
CATEGORY / CLUSTER / KEY IDEA	**AII-A.REI.**	**Algebra - Reasoning with Equations and Inequalities**
STANDARD / CONCEPTUAL UNDERSTANDING		**Understand solving equations as a process of reasoning and explain the reasoning.**
EXPECTATION / CONTENT SPECIFICATION	AII-A.REI.1b.	Explain each step when solving rational or radical equations as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

New York State Learning Standards and Core Curriculum

Science

Grade **11** - Adopted: **2016**

STRAND / DOMAIN / UNIFYING THEME	**NY.HS.2.**	**Chemical Reactions**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

STANDARD / CONCEPTUAL UNDERSTANDING	HS-PS1-12.	Use evidence to illustrate that some chemical reactions involve the transfer of electrons as an energy conversion occurs within a system.
STRAND / DOMAIN / UNIFYING THEME	**NY.HS.4.**	**Energy**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
STRAND / DOMAIN / UNIFYING THEME	**NY.HS.5.**	**Waves and Electromagnetic Radiation**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.
STRAND / DOMAIN / UNIFYING THEME	**NY.HS.8.**	**Interdependent Relationships in Ecosystems**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
STRAND / DOMAIN / UNIFYING THEME	**NY.HS.14.**	**Weather and Climate**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
STRAND / DOMAIN / UNIFYING THEME	**NY.HS.15.**	**Human Sustainability**

CATEGORY / CLUSTER / KEY IDEA		Students who demonstrate understanding can:
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ESS3-6.	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
STRAND / DOMAIN / UNIFYING THEME	**NY.HS.ED.**	**Engineering Design**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ETS1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ETS1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ETS1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Grade **11** - Adopted: **2011**

STRAND / DOMAIN / UNIFYING THEME	**NY.11-12.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Key Ideas and Details**

STANDARD / CONCEPTUAL UNDERSTANDING	11-12.RST.2.	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
STANDARD / CONCEPTUAL UNDERSTANDING	11-12.RST.3.	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
STRAND / DOMAIN / UNIFYING THEME	**NY.11-12.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Craft and Structure**
STANDARD / CONCEPTUAL UNDERSTANDING	11-12.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 11-12 texts and topics.
STANDARD / CONCEPTUAL UNDERSTANDING	11-12.RST.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
STRAND / DOMAIN / UNIFYING THEME	**NY.11-12.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Integration of Knowledge and Ideas**
STANDARD / CONCEPTUAL UNDERSTANDING	11-12.RST.9.	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
STRAND / DOMAIN / UNIFYING THEME	**NY.11-12.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	11-12.RST.10.	By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.
STRAND / DOMAIN / UNIFYING THEME	**NY.11-12.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Text Types and Purposes**

STANDARD / CONCEPTUAL UNDERSTANDING	**11-12.WHST.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
EXPECTATION / CONTENT SPECIFICATION	11-12.WHST.2.d.	Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.
STRAND / DOMAIN / UNIFYING THEME	**NY.11-12.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Production and Distribution of Writing**
STANDARD / CONCEPTUAL UNDERSTANDING	11-12.WHST.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
STANDARD / CONCEPTUAL UNDERSTANDING	11-12.WHST.6.	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

New York State Learning Standards and Core Curriculum

Science

Grade **12** - Adopted: **2016**

STRAND / DOMAIN / UNIFYING THEME	**NY.HS.2.**	**Chemical Reactions**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.
STANDARD / CONCEPTUAL UNDERSTANDING	HS-PS1-12.	Use evidence to illustrate that some chemical reactions involve the transfer of electrons as an energy conversion occurs within a system.
STRAND / DOMAIN / UNIFYING THEME	**NY.HS.4.**	**Energy**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**

STANDARD / CONCEPTUAL UNDERSTANDING	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

STRAND / DOMAIN / UNIFYING THEME	**NY.HS.5.**	**Waves and Electromagnetic Radiation**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.

STRAND / DOMAIN / UNIFYING THEME	**NY.HS.8.**	**Interdependent Relationships in Ecosystems**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

STRAND / DOMAIN / UNIFYING THEME	**NY.HS.14.**	**Weather and Climate**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

STRAND / DOMAIN / UNIFYING THEME	**NY.HS.15.**	**Human Sustainability**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

STANDARD / CONCEPTUAL UNDERSTANDING	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ESS3-6.	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
STRAND / DOMAIN / UNIFYING THEME	**NY.HS.ED.**	**Engineering Design**
CATEGORY / CLUSTER / KEY IDEA		**Students who demonstrate understanding can:**
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ETS1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ETS1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
STANDARD / CONCEPTUAL UNDERSTANDING	HS-ETS1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Grade **12** - Adopted: **2011**

STRAND / DOMAIN / UNIFYING THEME	**NY.11-12.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Key Ideas and Details**
STANDARD / CONCEPTUAL UNDERSTANDING	11-12.RST.2.	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

STANDARD / CONCEPTUAL UNDERSTANDING	11-12.RST.3.	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
STRAND / DOMAIN / UNIFYING THEME	**NY.11-12.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Craft and Structure**
STANDARD / CONCEPTUAL UNDERSTANDING	11-12.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 11-12 texts and topics.
STANDARD / CONCEPTUAL UNDERSTANDING	11-12.RST.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
STRAND / DOMAIN / UNIFYING THEME	**NY.11-12.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Integration of Knowledge and Ideas**
STANDARD / CONCEPTUAL UNDERSTANDING	11-12.RST.9.	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
STRAND / DOMAIN / UNIFYING THEME	**NY.11-12.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	11-12.RST.10.	By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.
STRAND / DOMAIN / UNIFYING THEME	**NY.11-12.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Text Types and Purposes**
STANDARD / CONCEPTUAL UNDERSTANDING	**11-12.WHST.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**

EXPECTATION / CONTENT SPECIFICATION	11-12.WHST.2.d.	Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.
STRAND / DOMAIN / UNIFYING THEME	**NY.11-12.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
CATEGORY / CLUSTER / KEY IDEA		**Production and Distribution of Writing**
STANDARD / CONCEPTUAL UNDERSTANDING	11-12.WHST.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
STANDARD / CONCEPTUAL UNDERSTANDING	11-12.WHST.6.	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

New York State Learning Standards and Core Curriculum

Technology Education

Grade **11** - Adopted: **1996**

STRAND / DOMAIN / UNIFYING THEME	**NY.5.**	**Technology: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.**
CATEGORY / CLUSTER / KEY IDEA	**5.1.**	**Engineering Design: Engineering design is an iterative process involving modeling and optimization used to develop technological solutions to problems within given constraints.**
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.1.	Students engage in the following steps in a design process initiate and carry out a thorough investigation of an unfamiliar situation and identify needs and opportunities for technological invention or innovation.
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.2.	Students identify, locate, and use a wide range of information resources including subject experts, library references, magazines, videotapes, films, electronic data bases and on-line services, and discuss and document through notes and sketches how findings relate to the problem.
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.3.	Students generate creative solution ideas, break ideas into the significant functional elements, and explore possible refinements; predict possible outcomes using mathematical and functional modeling techniques; choose the optimal solution to the problem, clearly documenting ideas against design criteria and constraints; and explain how human values, economics, ergonomics, and environmental considerations have influenced the solution.
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.4.	Students develop work schedules and plans which include optimal use and cost of materials, processes, time, and expertise; construct a model of the solution, incorporating developmental modifications while working to a high degree of quality (craftsmanship).
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.5.	Students in a group setting, devise a test of the solution relative to the design criteria and perform the test; record, portray, and logically evaluate performance test results through quantitative, graphic, and verbal means; and use a variety of creative verbal and graphic techniques effectively and persuasively to present conclusions, predict impacts and new problems, and suggest and pursue modifications.

STRAND / DOMAIN / UNIFYING THEME	**NY.5.**	**Technology: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.**
CATEGORY / CLUSTER / KEY IDEA	**5.3.**	**Computer Technology: Computers, as tools for design, modeling, information processing, communication, and system control, have greatly increased human productivity and knowledge.**
STANDARD / CONCEPTUAL UNDERSTANDING	5.3.5.	Students develop an understanding of computer programming and attain some facility in writing computer programs.

New York State Learning Standards and Core Curriculum

Technology Education

Grade **12** - Adopted: **1996**

STRAND / DOMAIN / UNIFYING THEME	**NY.5.**	**Technology: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.**
CATEGORY / CLUSTER / KEY IDEA	**5.1.**	**Engineering Design: Engineering design is an iterative process involving modeling and optimization used to develop technological solutions to problems within given constraints.**
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.1.	Students engage in the following steps in a design process initiate and carry out a thorough investigation of an unfamiliar situation and identify needs and opportunities for technological invention or innovation.
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.2.	Students identify, locate, and use a wide range of information resources including subject experts, library references, magazines, videotapes, films, electronic data bases and on-line services, and discuss and document through notes and sketches how findings relate to the problem.
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.3.	Students generate creative solution ideas, break ideas into the significant functional elements, and explore possible refinements; predict possible outcomes using mathematical and functional modeling techniques; choose the optimal solution to the problem, clearly documenting ideas against design criteria and constraints; and explain how human values, economics, ergonomics, and environmental considerations have influenced the solution.
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.4.	Students develop work schedules and plans which include optimal use and cost of materials, processes, time, and expertise; construct a model of the solution, incorporating developmental modifications while working to a high degree of quality (craftsmanship).
STANDARD / CONCEPTUAL UNDERSTANDING	5.1.5.	Students in a group setting, devise a test of the solution relative to the design criteria and perform the test; record, portray, and logically evaluate performance test results through quantitative, graphic, and verbal means; and use a variety of creative verbal and graphic techniques effectively and persuasively to present conclusions, predict impacts and new problems, and suggest and pursue modifications.
STRAND / DOMAIN / UNIFYING THEME	**NY.5.**	**Technology: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.**
CATEGORY / CLUSTER / KEY IDEA	**5.3.**	**Computer Technology: Computers, as tools for design, modeling, information processing, communication, and system control, have greatly increased human productivity and knowledge.**

STANDARD / CONCEPTUAL UNDERSTANDING	5.3.5.	Students develop an understanding of computer programming and attain some facility in writing computer programs.

North Carolina Standard Course of Study

Mathematics

Grade **11** - Adopted: **2016/IMPL 2016**

CONTENT AREA / STRAND		Math 1
STRAND / ESSENTIAL STANDARD		**Standards for Mathematical Practice**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.1.	Make sense of problems and persevere in solving them.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.2.	Reason abstractly and quantitatively.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.3.	Construct viable arguments and critique the reasoning of others.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.4.	Model with mathematics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.8.	Look for and express regularity in repeated reasoning.

CONTENT AREA / STRAND		Math 1
STRAND / ESSENTIAL STANDARD		**Algebra: Creating Equations**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Create equations that describe numbers or relationships.**
CLARIFYING OBJECTIVE	NC.M1.A-CED.2.	Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.

CONTENT AREA / STRAND		Math 1
STRAND / ESSENTIAL STANDARD		**Algebra: Reasoning with Equations and Inequalities**

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Understand solving equations as a process of reasoning and explain the reasoning.**
CLARIFYING OBJECTIVE	NC.M1.A-REI.1.	Justify a chosen solution method and each step of the solving process for linear and quadratic equations using mathematical reasoning.
CONTENT AREA / STRAND		**Math 1**
STRAND / ESSENTIAL STANDARD		**Geometry: Expressing Geometric Properties with Equations**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Use coordinates to prove simple geometric theorems algebraically.**
CLARIFYING OBJECTIVE	**NC.M1.G-GPE.5.**	**Use coordinates to prove the slope criteria for parallel and perpendicular lines and use them to solve problems.**
INDICATOR	NC.M1.G-GPE.5b.	Find the equation of a line parallel or perpendicular to a given line that passes through a given point.
CONTENT AREA / STRAND		**Math 2**
STRAND / ESSENTIAL STANDARD		**Standards for Mathematical Practice**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.1.	Make sense of problems and persevere in solving them.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.2.	Reason abstractly and quantitatively.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.3.	Construct viable arguments and critique the reasoning of others.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.4.	Model with mathematics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.8.	Look for and express regularity in repeated reasoning.
CONTENT AREA / STRAND		**Math 3**
STRAND / ESSENTIAL STANDARD		**Standards for Mathematical Practice**

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.1.	Make sense of problems and persevere in solving them.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.2.	Reason abstractly and quantitatively.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.3.	Construct viable arguments and critique the reasoning of others.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.4.	Model with mathematics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.8.	Look for and express regularity in repeated reasoning.

Grade **11** - Adopted: **2019/IMPL 2020**

CONTENT AREA / STRAND		**Math 4**
STRAND / ESSENTIAL STANDARD		**Standards for Mathematical Practice**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.1.	Make sense of problems and persevere in solving them.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.2.	Reason abstractly and quantitatively.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.3.	Construct viable arguments and critique the reasoning of others.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.4.	Model with mathematics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.8.	Look for and express regularity in repeated reasoning.

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.9.	Use strategies and procedures flexibly.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.10.	Reflect on mistakes and misconceptions.
CONTENT AREA / STRAND		**Discrete Mathematics for Computer Science**
STRAND / ESSENTIAL STANDARD		**Standards for Mathematical Practice**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.1.	Make sense of problems and persevere in solving them.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.2.	Reason abstractly and quantitatively.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.3.	Construct viable arguments and critique the reasoning of others.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.4.	Model with mathematics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.8.	Look for and express regularity in repeated reasoning.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.9.	Use strategies and procedures flexibly.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.10.	Reflect on mistakes and misconceptions.
CONTENT AREA / STRAND		**Precalculus**
STRAND / ESSENTIAL STANDARD		**Standards for Mathematical Practice**

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.1.	Make sense of problems and persevere in solving them.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.2.	Reason abstractly and quantitatively.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.3.	Construct viable arguments and critique the reasoning of others.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.4.	Model with mathematics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.8.	Look for and express regularity in repeated reasoning.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.9.	Use strategies and procedures flexibly.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.10.	Reflect on mistakes and misconceptions.

North Carolina Standard Course of Study

Mathematics

Grade **12** - Adopted: **2016/IMPL 2016**

CONTENT AREA / STRAND		**Math 1**
STRAND / ESSENTIAL STANDARD		**Standards for Mathematical Practice**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.1.	Make sense of problems and persevere in solving them.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.2.	Reason abstractly and quantitatively.

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.3.	Construct viable arguments and critique the reasoning of others.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.4.	Model with mathematics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.8.	Look for and express regularity in repeated reasoning.
CONTENT AREA / STRAND		**Math 1**
STRAND / ESSENTIAL STANDARD		**Algebra: Creating Equations**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Create equations that describe numbers or relationships.**
CLARIFYING OBJECTIVE	NC.M1.A-CED.2.	Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.
CONTENT AREA / STRAND		**Math 1**
STRAND / ESSENTIAL STANDARD		**Algebra: Reasoning with Equations and Inequalities**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Understand solving equations as a process of reasoning and explain the reasoning.**
CLARIFYING OBJECTIVE	NC.M1.A-REI.1.	Justify a chosen solution method and each step of the solving process for linear and quadratic equations using mathematical reasoning.
CONTENT AREA / STRAND		**Math 1**
STRAND / ESSENTIAL STANDARD		**Geometry: Expressing Geometric Properties with Equations**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Use coordinates to prove simple geometric theorems algebraically.**
CLARIFYING OBJECTIVE	**NC.M1.G-GPE.5.**	**Use coordinates to prove the slope criteria for parallel and perpendicular lines and use them to solve problems.**
INDICATOR	NC.M1.G-GPE.5b.	Find the equation of a line parallel or perpendicular to a given line that passes through a given point.
CONTENT AREA / STRAND		**Math 2**

STRAND / ESSENTIAL STANDARD		Standards for Mathematical Practice
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.1.	Make sense of problems and persevere in solving them.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.2.	Reason abstractly and quantitatively.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.3.	Construct viable arguments and critique the reasoning of others.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.4.	Model with mathematics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.8.	Look for and express regularity in repeated reasoning.

CONTENT AREA / STRAND		Math 3
STRAND / ESSENTIAL STANDARD		**Standards for Mathematical Practice**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.1.	Make sense of problems and persevere in solving them.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.2.	Reason abstractly and quantitatively.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.3.	Construct viable arguments and critique the reasoning of others.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.4.	Model with mathematics.

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

Grade **12** - Adopted: **2019/IMPL 2020**

CONTENT AREA / STRAND		**Math 4**
STRAND / ESSENTIAL STANDARD		**Standards for Mathematical Practice**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.1.	Make sense of problems and persevere in solving them.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.2.	Reason abstractly and quantitatively.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.3.	Construct viable arguments and critique the reasoning of others.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.4.	Model with mathematics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.8.	Look for and express regularity in repeated reasoning.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.9.	Use strategies and procedures flexibly.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.10.	Reflect on mistakes and misconceptions.

CONTENT AREA / STRAND		**Discrete Mathematics for Computer Science**
STRAND / ESSENTIAL STANDARD		**Standards for Mathematical Practice**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.1.	Make sense of problems and persevere in solving them.

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.2.	Reason abstractly and quantitatively.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.3.	Construct viable arguments and critique the reasoning of others.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.4.	Model with mathematics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.8.	Look for and express regularity in repeated reasoning.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.9.	Use strategies and procedures flexibly.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.10.	Reflect on mistakes and misconceptions.
CONTENT AREA / STRAND		**Precalculus**
STRAND / ESSENTIAL STANDARD		**Standards for Mathematical Practice**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.1.	Make sense of problems and persevere in solving them.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.2.	Reason abstractly and quantitatively.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.3.	Construct viable arguments and critique the reasoning of others.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.4.	Model with mathematics.

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.8.	Look for and express regularity in repeated reasoning.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.9.	Use strategies and procedures flexibly.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	MP.10.	Reflect on mistakes and misconceptions.

North Carolina Standard Course of Study

Science

Grade **11** - Adopted: **2010**

CONTENT AREA / STRAND	**NC.PSc.**	**Physical Science**
STRAND / ESSENTIAL STANDARD		**Energy: Conservation and Transfer**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**PSc.3.3.**	**Understand electricity and magnetism and their relationship.**
CLARIFYING OBJECTIVE	PSc.3.3.5.	Explain the practical applications of magnetism.

CONTENT AREA / STRAND	**NC.Bio.**	**Biology**
STRAND / ESSENTIAL STANDARD		**Ecosystems**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**Bio.2.2.**	**Understand the impact of human activities on the environment (one generation affects the next).**
CLARIFYING OBJECTIVE	Bio.2.2.1.	Infer how human activities (including population growth, pollution, global warming, burning of fossil fuels, habitat destruction and introduction of nonnative species) may impact the environment.

CONTENT AREA / STRAND	**NC.EEn.**	**Earth/Environmental Science**
STRAND / ESSENTIAL STANDARD		**Earth: Systems, Structures and Processes**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**EEn.2.5.**	**Understand the structure of and processes within our atmosphere.**
CLARIFYING OBJECTIVE	EEn.2.5.5.	Explain how human activities affect air quality.

CONTENT AREA / STRAND	**NC.EEn.**	**Earth/Environmental Science**
STRAND / ESSENTIAL STANDARD		**Earth: Systems, Structures and Processes**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**EEn.2.6.**	**Analyze patterns of global climate change over time.**
CLARIFYING OBJECTIVE	EEn.2.6.2.	Explain changes in global climate due to natural processes.
CLARIFYING OBJECTIVE	EEn.2.6.3.	Analyze the impacts that human activities have on global climate change (such as burning hydrocarbons, greenhouse effect, and deforestation).
CLARIFYING OBJECTIVE	EEn.2.6.4.	Attribute changes in Earth systems to global climate change (temperature change, changes in pH of ocean, sea level changes, etc.).

CONTENT AREA / STRAND	**NC.EEn.**	**Earth/Environmental Science**
STRAND / ESSENTIAL STANDARD		**Earth: Systems, Structures and Processes**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**EEn.2.8.**	**Evaluate human behaviors in terms of how likely they are to ensure the ability to live sustainably on Earth.**
CLARIFYING OBJECTIVE	EEn.2.8.1.	Evaluate alternative energy technologies for use in North Carolina.

CONTENT AREA / STRAND	**NC.OBio.**	**Occupational Course of Study - Biology**
STRAND / ESSENTIAL STANDARD		**Ecosystems**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**OBio.2.2.**	**Understand the impact of human activities on the environment (one generation affects the next).**
CLARIFYING OBJECTIVE	Bio.2.2.1.	Infer how human activities (including population growth, pollution, global warming, burning of fossil fuels, habitat destruction and introduction of nonnative species) may impact the environment.

CONTENT AREA / STRAND	**NC.OA.**	**Occupational Course of Study - Applied Science**
STRAND / ESSENTIAL STANDARD		**Chemicals**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**OA5.1.**	**Identify the uses and dangers of common chemicals.**
CLARIFYING OBJECTIVE	OA5.1.1.	Identify uses of common chemicals.

CONTENT AREA / STRAND	NC.OA.	Occupational Course of Study - Applied Science
STRAND / ESSENTIAL STANDARD		**The Environment**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**OA6.1.**	**Understand how humans can have positive and negative effects on the environment.**
CLARIFYING OBJECTIVE	OA6.1.1.	Explain how humans can have a positive impact on natural resources.
CLARIFYING OBJECTIVE	OA6.1.2.	Explain the effects of pollution on the earth, air and waterways and what can be done at the individual, family and community level to reduce pollution.

CONTENT AREA / STRAND	NC.CC.11-12.RST.	Reading Standards for Literacy in Science and Technical Subjects
STRAND / ESSENTIAL STANDARD		**Key Ideas and Details**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	11-12.RST.2.	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	11-12.RST.3.	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

CONTENT AREA / STRAND	NC.CC.11-12.RST.	Reading Standards for Literacy in Science and Technical Subjects
STRAND / ESSENTIAL STANDARD		**Craft and Structure**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	11-12.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 11-12 texts and topics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	11-12.RST.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

CONTENT AREA / STRAND	NC.CC.11-12.RST.	Reading Standards for Literacy in Science and Technical Subjects
STRAND / ESSENTIAL STANDARD		**Integration of Knowledge and Ideas**

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	11-12.RST.9.	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

CONTENT AREA / STRAND	**NC.CC.11-12.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	11-12.RST.10.	By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.

CONTENT AREA / STRAND	**NC.CC.11-12.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / ESSENTIAL STANDARD		**Text Types and Purposes**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**11-12.WHST.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
CLARIFYING OBJECTIVE	11-12.WHST.2.d.	Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.

CONTENT AREA / STRAND	**NC.CC.11-12.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / ESSENTIAL STANDARD		**Production and Distribution of Writing**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	11-12.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	11-12.WHST.6.	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

North Carolina Standard Course of Study

Science

Grade **12** - Adopted: **2010**

CONTENT AREA / STRAND	**NC.PSc.**	**Physical Science**
STRAND / ESSENTIAL STANDARD		**Energy: Conservation and Transfer**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**PSc.3.3.**	**Understand electricity and magnetism and their relationship.**

CLARIFYING OBJECTIVE	PSc.3.3.5.	Explain the practical applications of magnetism.

CONTENT AREA / STRAND	NC.Bio.	Biology
STRAND / ESSENTIAL STANDARD		Ecosystems
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	Bio.2.2.	Understand the impact of human activities on the environment (one generation affects the next).

CLARIFYING OBJECTIVE	Bio.2.2.1.	Infer how human activities (including population growth, pollution, global warming, burning of fossil fuels, habitat destruction and introduction of nonnative species) may impact the environment.

CONTENT AREA / STRAND	NC.EEn.	Earth/Environmental Science
STRAND / ESSENTIAL STANDARD		Earth: Systems, Structures and Processes
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	EEn.2.5.	Understand the structure of and processes within our atmosphere.

CLARIFYING OBJECTIVE	EEn.2.5.5.	Explain how human activities affect air quality.

CONTENT AREA / STRAND	NC.EEn.	Earth/Environmental Science
STRAND / ESSENTIAL STANDARD		Earth: Systems, Structures and Processes
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	EEn.2.6.	Analyze patterns of global climate change over time.

CLARIFYING OBJECTIVE	EEn.2.6.2.	Explain changes in global climate due to natural processes.
CLARIFYING OBJECTIVE	EEn.2.6.3.	Analyze the impacts that human activities have on global climate change (such as burning hydrocarbons, greenhouse effect, and deforestation).
CLARIFYING OBJECTIVE	EEn.2.6.4.	Attribute changes in Earth systems to global climate change (temperature change, changes in pH of ocean, sea level changes, etc.).

CONTENT AREA / STRAND	NC.EEn.	Earth/Environmental Science
STRAND / ESSENTIAL STANDARD		Earth: Systems, Structures and Processes
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	EEn.2.8.	Evaluate human behaviors in terms of how likely they are to ensure the ability to live sustainably on Earth.

CLARIFYING OBJECTIVE	EEn.2.8.1.	Evaluate alternative energy technologies for use in North Carolina.

CONTENT AREA / STRAND	NC.OBio.	Occupational Course of Study - Biology
STRAND / ESSENTIAL STANDARD		Ecosystems
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	OBio.2.2.	Understand the impact of human activities on the environment (one generation affects the next).

CLARIFYING OBJECTIVE	Bio.2.2.1.	Infer how human activities (including population growth, pollution, global warming, burning of fossil fuels, habitat destruction and introduction of nonnative species) may impact the environment.

CONTENT AREA / STRAND	NC.OA.	Occupational Course of Study - Applied Science
STRAND / ESSENTIAL STANDARD		Chemicals
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	OA5.1.	Identify the uses and dangers of common chemicals.

CLARIFYING OBJECTIVE	OA5.1.1.	Identify uses of common chemicals.

CONTENT AREA / STRAND	NC.OA.	Occupational Course of Study - Applied Science
STRAND / ESSENTIAL STANDARD		The Environment
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	OA6.1.	Understand how humans can have positive and negative effects on the environment.

CLARIFYING OBJECTIVE	OA6.1.1.	Explain how humans can have a positive impact on natural resources.
CLARIFYING OBJECTIVE	OA6.1.2.	Explain the effects of pollution on the earth, air and waterways and what can be done at the individual, family and community level to reduce pollution.

CONTENT AREA / STRAND	NC.CC.11-12.RST.	Reading Standards for Literacy in Science and Technical Subjects
STRAND / ESSENTIAL STANDARD		Key Ideas and Details

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	11-12.RST.2.	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	11-12.RST.3.	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

CONTENT AREA / STRAND	**NC.CC.11-12.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / ESSENTIAL STANDARD		**Craft and Structure**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	11-12.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 11-12 texts and topics.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	11-12.RST.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

CONTENT AREA / STRAND	**NC.CC.11-12.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND / ESSENTIAL STANDARD		**Integration of Knowledge and Ideas**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	11-12.RST.9.	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

CONTENT AREA / STRAND	**NC.CC.11-12.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	11-12.RST.10.	By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.

CONTENT AREA / STRAND	**NC.CC.11-12.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND / ESSENTIAL STANDARD		**Text Types and Purposes**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	**11-12.WHST.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
CLARIFYING OBJECTIVE	11-12.WHST.2.d.	Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.

CONTENT AREA / STRAND	NC.CC.11-12.WHST.	Writing Standards for Literacy in Science and Technical Subjects
STRAND / ESSENTIAL STANDARD		**Production and Distribution of Writing**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	11-12.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	11-12.WHST.6.	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

North Carolina Standard Course of Study

Technology Education

Grade **11** - Adopted: **2020 (ISTE-S)**

CONTENT AREA / STRAND		Digital Learning Standards
STRAND / ESSENTIAL STANDARD	**ISTE-S.3.**	**Knowledge Constructor: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.3.d.	Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

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

CONTENT AREA / STRAND		Digital Learning Standards
STRAND / ESSENTIAL STANDARD	**ISTE-S.5.**	**Computational Thinker: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.5.a.	Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.5.b.	Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.5.d.	Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Grade **11** - Adopted: **2020**

CONTENT AREA / STRAND		**NC K-12 Computer Science Standards**
STRAND / ESSENTIAL STANDARD		**Introduction to CS**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Algorithms & Programming**
CLARIFYING OBJECTIVE		**Algorithms**
INDICATOR	ICS-AP-01.	Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.

CONTENT AREA / STRAND		**NC K-12 Computer Science Standards**
STRAND / ESSENTIAL STANDARD		**Introduction to CS**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Algorithms & Programming**
CLARIFYING OBJECTIVE		**Program Development**
INDICATOR	ICS-AP-13.	Develop computational artifacts working in team roles using collaborative tools.

CONTENT AREA / STRAND		**NC K-12 Computer Science Standards**
STRAND / ESSENTIAL STANDARD		**Introduction to CS**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Impacts of Computing**
CLARIFYING OBJECTIVE		**Culture**
INDICATOR	ICS-IC-04.	Test computational artifacts to reduce bias and equity deficits.

INDICATOR	ICS-IC-05.	Demonstrate ways a given algorithm applies to problems across disciplines.

CONTENT AREA / STRAND		NC K-12 Computer Science Standards
STRAND / ESSENTIAL STANDARD		High School – CS Level 1
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		Networks & The Internet
CLARIFYING OBJECTIVE		Network Communication & Organization
INDICATOR	HS-NI-01.	Identify issues of network functionality in computational artifact design.
INDICATOR	HS-NI-02.	Analyze issues of network functionality in computational artifact design.

CONTENT AREA / STRAND		NC K-12 Computer Science Standards
STRAND / ESSENTIAL STANDARD		High School – CS Level 1
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		Networks & The Internet
CLARIFYING OBJECTIVE		Cybersecurity
INDICATOR	HS-NI-03.	Identify issues of unauthorized access and cybersecurity in computational artifact design.
INDICATOR	HS-NI-04.	Analyze issues of unauthorized access and cybersecurity in computational artifact design.

CONTENT AREA / STRAND		NC K-12 Computer Science Standards
STRAND / ESSENTIAL STANDARD		High School – CS Level 1
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		Algorithms & Programming
CLARIFYING OBJECTIVE		Algorithms
INDICATOR	HS-AP-01.	Identify artificial intelligence algorithms.
INDICATOR	HS-AP-02.	Solve computational problems with classic algorithms.

CONTENT AREA / STRAND		NC K-12 Computer Science Standards

STRAND / ESSENTIAL STANDARD		**High School – CS Level 1**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Algorithms & Programming**
CLARIFYING OBJECTIVE		**Program Development**
INDICATOR	HS-AP-09.	Create a computational artifact through an industry-standard process.
INDICATOR	HS-AP-10.	Justify that a computational artifact meets design specifications with systematic testing and debugging methods.

CONTENT AREA / STRAND		**NC K-12 Computer Science Standards**
STRAND / ESSENTIAL STANDARD		**High School – CS Level 1**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Impacts of Computing**
CLARIFYING OBJECTIVE		**Culture**
INDICATOR	HS-IC-05.	Create computational artifacts to ensure accessibility and reduce computational bias.

North Carolina Standard Course of Study

Technology Education

Grade **12** - Adopted: **2020 (ISTE-S)**

CONTENT AREA / STRAND		**Digital Learning Standards**
STRAND / ESSENTIAL STANDARD	**ISTE-S.3.**	**Knowledge Constructor: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.3.d.	Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

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

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

CONTENT AREA / STRAND		Digital Learning Standards
STRAND / ESSENTIAL STANDARD	**ISTE-S.5.**	**Computational Thinker: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.5.a.	Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.5.b.	Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE	ISTE-S.5.d.	Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Grade **12** - Adopted: **2020**

CONTENT AREA / STRAND		NC K-12 Computer Science Standards
STRAND / ESSENTIAL STANDARD		**Introduction to CS**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Algorithms & Programming**
CLARIFYING OBJECTIVE		**Algorithms**
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CLARIFYING OBJECTIVE		Culture
INDICATOR	ICS-IC-04.	Test computational artifacts to reduce bias and equity deficits.
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STRAND / ESSENTIAL STANDARD		High School – CS Level 1

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CLARIFYING OBJECTIVE		**Program Development**
INDICATOR	HS-AP-09.	Create a computational artifact through an industry-standard process.
INDICATOR	HS-AP-10.	Justify that a computational artifact meets design specifications with systematic testing and debugging methods.

CONTENT AREA / STRAND		**NC K-12 Computer Science Standards**
STRAND / ESSENTIAL STANDARD		**High School – CS Level 1**
ESSENTIAL STANDARD / CLARIFYING OBJECTIVE		**Impacts of Computing**
CLARIFYING OBJECTIVE		**Culture**
INDICATOR	HS-IC-05.	Create computational artifacts to ensure accessibility and reduce computational bias.

North Dakota Content Standards

Mathematics

Grade **11** - 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.8	Look for and express regularity in repeated reasoning.
CONTENT STANDARD		**High School—Algebra**
BENCHMARK		**Creating Equations and Inequalities**
GRADE LEVEL EXPECTATION		**Create equations that describe numbers or relationships**
INDICATOR	HS.A-CED.2	Create equations in two or more variables to represent relationships between quantities. Graph equations on coordinate axes with appropriate labels and scales.
CONTENT STANDARD		**High School—Algebra**
BENCHMARK		**Reasoning with Equations and Inequalities**
GRADE LEVEL EXPECTATION		**Understand solving equations as a process of reasoning and explain the reasoning**
INDICATOR	HS.A-REI.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
CONTENT STANDARD		**High School—Functions**
BENCHMARK		**Interpreting Functions**
GRADE LEVEL EXPECTATION		**Analyze functions using different representations**
INDICATOR	**HS.F-IF.7**	**Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.**
INDICATOR	HS.F-IF.7.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima where appropriate.
CONTENT STANDARD		**High School—Functions**
BENCHMARK		**Linear, Quadratic, and Exponential Models**
GRADE LEVEL EXPECTATION		**Construct and compare linear, quadratic, and exponential models and solve problems**
INDICATOR	HS.F-LE.1	Identify situations that can be modeled with linear, quadratic, and exponential functions. Justify the most appropriate model for a situation based on the rate of change over equal intervals. Include situations in which a quantity grows or decays.

North Dakota Content Standards

Mathematics

Grade **12** - 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.8	Look for and express regularity in repeated reasoning.
CONTENT STANDARD		**High School—Algebra**
BENCHMARK		**Creating Equations and Inequalities**
GRADE LEVEL EXPECTATION		**Create equations that describe numbers or relationships**
INDICATOR	HS.A-CED.2	Create equations in two or more variables to represent relationships between quantities. Graph equations on coordinate axes with appropriate labels and scales.
CONTENT STANDARD		**High School—Algebra**
BENCHMARK		**Reasoning with Equations and Inequalities**
GRADE LEVEL EXPECTATION		**Understand solving equations as a process of reasoning and explain the reasoning**
INDICATOR	HS.A-REI.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
CONTENT STANDARD		**High School—Functions**
BENCHMARK		**Interpreting Functions**
GRADE LEVEL EXPECTATION		**Analyze functions using different representations**
INDICATOR	**HS.F-IF.7**	**Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.**
INDICATOR	HS.F-IF.7.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima where appropriate.
CONTENT STANDARD		**High School—Functions**
BENCHMARK		**Linear, Quadratic, and Exponential Models**
GRADE LEVEL EXPECTATION		**Construct and compare linear, quadratic, and exponential models and solve problems**
INDICATOR	HS.F-LE.1	Identify situations that can be modeled with linear, quadratic, and exponential functions. Justify the most appropriate model for a situation based on the rate of change over equal intervals. Include situations in which a quantity grows or decays.

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		**Life Science (LS)**
BENCHMARK	**HS-LS2.**	**ECOSYSTEMS: INTERACTIONS, ENERGY, AND DYNAMICS**
GRADE LEVEL EXPECTATION	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

CONTENT STANDARD		**Physical Science (PS)**
BENCHMARK	**HS-PS1.**	**MATTER AND ITS INTERACTIONS**
GRADE LEVEL EXPECTATION	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

CONTENT STANDARD		**Physical Science (PS)**
BENCHMARK	**HS-PS3.**	**ENERGY**
GRADE LEVEL EXPECTATION	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

CONTENT STANDARD		**Earth and Space Science (ESS)**
BENCHMARK	**HS-ESS2.**	**Earth's Systems**
GRADE LEVEL EXPECTATION	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

CONTENT STANDARD		**Earth and Space Science (ESS)**
BENCHMARK	**HS-ESS3.**	**EARTH AND HUMAN ACTIVITY**
GRADE LEVEL EXPECTATION	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

GRADE LEVEL EXPECTATION	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
GRADE LEVEL EXPECTATION	HS-ESS3-3.	Analyze the relationships among management of natural resources, the sustainability of human populations, and biodiversity through the use of a computational simulation.
GRADE LEVEL EXPECTATION	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
GRADE LEVEL EXPECTATION	HS-ESS3-6.	Use data from computational representations to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
CONTENT STANDARD		**Engineering and Technology (ET)**
BENCHMARK	**HS-ET1.**	**Engineering & Technology**
GRADE LEVEL EXPECTATION	HS-ET1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
GRADE LEVEL EXPECTATION	HS-ET1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
GRADE LEVEL EXPECTATION	HS-ET1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

North Dakota Content Standards

Science

Grade **12** - 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		**Life Science (LS)**
BENCHMARK	**HS-LS2.**	**ECOSYSTEMS: INTERACTIONS, ENERGY, AND DYNAMICS**
GRADE LEVEL EXPECTATION	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

CONTENT STANDARD		**Physical Science (PS)**
BENCHMARK	**HS-PS1.**	**MATTER AND ITS INTERACTIONS**
GRADE LEVEL EXPECTATION	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

CONTENT STANDARD		**Physical Science (PS)**
BENCHMARK	**HS-PS3.**	**ENERGY**
GRADE LEVEL EXPECTATION	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

CONTENT STANDARD		**Earth and Space Science (ESS)**
BENCHMARK	**HS-ESS2.**	**Earth's Systems**
GRADE LEVEL EXPECTATION	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

CONTENT STANDARD		**Earth and Space Science (ESS)**
BENCHMARK	**HS-ESS3.**	**EARTH AND HUMAN ACTIVITY**
GRADE LEVEL EXPECTATION	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
GRADE LEVEL EXPECTATION	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
GRADE LEVEL EXPECTATION	HS-ESS3-3.	Analyze the relationships among management of natural resources, the sustainability of human populations, and biodiversity through the use of a computational simulation.
GRADE LEVEL EXPECTATION	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
GRADE LEVEL EXPECTATION	HS-ESS3-6.	Use data from computational representations to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

CONTENT STANDARD		**Engineering and Technology (ET)**
BENCHMARK	**HS-ET1.**	**Engineering & Technology**
GRADE LEVEL EXPECTATION	HS-ET1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
GRADE LEVEL EXPECTATION	HS-ET1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

GRADE LEVEL EXPECTATION	HS-ET1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

North Dakota Content Standards

Technology Education

Grade **11** - Adopted: **2019**

CONTENT STANDARD		**Computer Science and Cybersecurity Standards**
BENCHMARK		**Computational Thinking**
GRADE LEVEL EXPECTATION		**Problem Solving & Algorithms**
INDICATOR		**Strategies for understanding and solving problems.**
INDICATOR	11.PSA.1.	Demonstrate ways a given algorithm applies to problems across disciplines and explain the benefits and drawbacks of choices made.

CONTENT STANDARD		**Computer Science and Cybersecurity Standards**
BENCHMARK		**CS Extension Standards**
GRADE LEVEL EXPECTATION		**Computational Thinking**
INDICATOR		**Algorithms & Programming**
INDICATOR	ES.AP.1.	Design algorithms to solve computational problems using a combination of original and existing algorithms.

North Dakota Content Standards

Technology Education

Grade **12** - Adopted: **2019**

CONTENT STANDARD		**Computer Science and Cybersecurity Standards**
BENCHMARK		**Computational Thinking**
GRADE LEVEL EXPECTATION		**Problem Solving & Algorithms**
INDICATOR		**Strategies for understanding and solving problems.**
INDICATOR	12.PSA.1.	Use and adapt common algorithms to solve computational problems.

CONTENT STANDARD		**Computer Science and Cybersecurity Standards**
BENCHMARK		**CS Extension Standards**
GRADE LEVEL EXPECTATION		**Computational Thinking**
INDICATOR		**Algorithms & Programming**
INDICATOR	ES.AP.1.	Design algorithms to solve computational problems using a combination of original and existing algorithms.

Ohio Learning Standards

Mathematics

Grade **11** - 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.8.	Look for and express regularity in repeated reasoning.

DOMAIN / ACADEMIC CONTENT STANDARD	OH.A.	Algebra Standards
STANDARD / BENCHMARK	**A.CED.**	**CREATING EQUATIONS**
BENCHMARK / GRADE LEVEL INDICATOR		**Create equations that describe numbers or relationships.**
PROFICIENCY LEVEL	**A.CED.2.**	**Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.**
INDICATOR	A.CED.2. a.	Focus on applying linear and simple exponential expressions. (A1, M1)

DOMAIN / ACADEMIC CONTENT STANDARD	OH.A.	Algebra Standards
STANDARD / BENCHMARK	**A.REI.**	**REASONING WITH EQUATIONS AND INEQUALITIES**
BENCHMARK / GRADE LEVEL INDICATOR		**Understand solving equations as a process of reasoning and explain the reasoning.**
PROFICIENCY LEVEL	A.REI.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

DOMAIN / ACADEMIC CONTENT STANDARD	OH.F.	Functions Standards
STANDARD / BENCHMARK	**F.IF.**	**INTERPRETING FUNCTIONS**

BENCHMARK / GRADE LEVEL INDICATOR		**Analyze functions using different representations.**
PROFICIENCY LEVEL	**F.IF.7.**	**Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.**
INDICATOR	F.IF.7.a.	Graph linear functions and indicate intercepts. (A1, M1)
DOMAIN / ACADEMIC CONTENT STANDARD	**OH.F.**	**Functions Standards**
STANDARD / BENCHMARK	**F.LE.**	**LINEAR, QUADRATIC, AND EXPONENTIAL MODELS**
BENCHMARK / GRADE LEVEL INDICATOR		**Construct and compare linear, quadratic, and exponential models, and solve problems.**
PROFICIENCY LEVEL	**F.LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
INDICATOR	F.LE.1.a.	Show that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.
DOMAIN / ACADEMIC CONTENT STANDARD	**OH.G.**	**Geometry Standards**
STANDARD / BENCHMARK	**G.GPE.**	**EXPRESSING GEOMETRIC PROPERTIES WITH EQUATIONS**
BENCHMARK / GRADE LEVEL INDICATOR		**Use coordinates to prove simple geometric theorems algebraically and to verify specific geometric statements.**
PROFICIENCY LEVEL	G.GPE.5.	Justify the slope criteria for parallel and perpendicular lines, and use them to solve geometric problems, e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point.

Ohio Learning Standards

Mathematics

Grade **12** - 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.8.	Look for and express regularity in repeated reasoning.

DOMAIN / ACADEMIC CONTENT STANDARD	**OH.A.**	**Algebra Standards**
STANDARD / BENCHMARK	**A.CED.**	**CREATING EQUATIONS**
BENCHMARK / GRADE LEVEL INDICATOR		**Create equations that describe numbers or relationships.**
PROFICIENCY LEVEL	**A.CED.2.**	**Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.**
INDICATOR	A.CED.2.a.	Focus on applying linear and simple exponential expressions. (A1, M1)

DOMAIN / ACADEMIC CONTENT STANDARD	**OH.A.**	**Algebra Standards**
STANDARD / BENCHMARK	**A.REI.**	**REASONING WITH EQUATIONS AND INEQUALITIES**
BENCHMARK / GRADE LEVEL INDICATOR		**Understand solving equations as a process of reasoning and explain the reasoning.**
PROFICIENCY LEVEL	A.REI.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

DOMAIN / ACADEMIC CONTENT STANDARD	**OH.F.**	**Functions Standards**
STANDARD / BENCHMARK	**F.IF.**	**INTERPRETING FUNCTIONS**
BENCHMARK / GRADE LEVEL INDICATOR		**Analyze functions using different representations.**
PROFICIENCY LEVEL	**F.IF.7.**	**Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.**
INDICATOR	F.IF.7.a.	Graph linear functions and indicate intercepts. (A1, M1)

DOMAIN / ACADEMIC CONTENT STANDARD	**OH.F.**	**Functions Standards**
STANDARD / BENCHMARK	**F.LE.**	**LINEAR, QUADRATIC, AND EXPONENTIAL MODELS**
BENCHMARK / GRADE LEVEL INDICATOR		**Construct and compare linear, quadratic, and exponential models, and solve problems.**

PROFICIENCY LEVEL	**F.LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
INDICATOR	F.LE.1.a.	Show that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.
DOMAIN / ACADEMIC CONTENT STANDARD	**OH.G.**	**Geometry Standards**
STANDARD / BENCHMARK	**G.GPE.**	**EXPRESSING GEOMETRIC PROPERTIES WITH EQUATIONS**
BENCHMARK / GRADE LEVEL INDICATOR		**Use coordinates to prove simple geometric theorems algebraically and to verify specific geometric statements.**
PROFICIENCY LEVEL	G.GPE.5.	Justify the slope criteria for parallel and perpendicular lines, and use them to solve geometric problems, e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point.

Ohio Learning Standards

Science

Grade **11** - Adopted: **2018**

DOMAIN / ACADEMIC CONTENT STANDARD		**Environmental Science**
STANDARD / BENCHMARK		**EARTH SYSTEMS: INTERCONNECTED SPHERES OF EARTH**
BENCHMARK / GRADE LEVEL INDICATOR	**ENV.ES. 5:**	**Movement of matter and energy through the hydrosphere, lithosphere, atmosphere and biosphere**
PROFICIENCY LEVEL		Climate
DOMAIN / ACADEMIC CONTENT STANDARD		**Environmental Science**
STANDARD / BENCHMARK		**EARTH'S RESOURCES**
BENCHMARK / GRADE LEVEL INDICATOR	**ENV.ER. 1:**	**Energy resources**
PROFICIENCY LEVEL		Renewable and nonrenewable energy sources and efficiency
PROFICIENCY LEVEL		Alternate energy sources and efficiency
PROFICIENCY LEVEL		Resource availability
DOMAIN / ACADEMIC CONTENT STANDARD		**Environmental Science**

STANDARD / BENCHMARK		**EARTH'S RESOURCES**
BENCHMARK / GRADE LEVEL INDICATOR	**ENV.ER. 2:**	**Air and air pollution**
PROFICIENCY LEVEL		Greenhouse gases
DOMAIN / ACADEMIC CONTENT STANDARD		**Environmental Science**
STANDARD / BENCHMARK	**ENV.GP:**	**GLOBAL ENVIRONMENTAL PROBLEMS AND ISSUES**
BENCHMARK / GRADE LEVEL INDICATOR	ENV.GP. 3:	Climate change
BENCHMARK / GRADE LEVEL INDICATOR	ENV.GP. 4:	Sustainability
BENCHMARK / GRADE LEVEL INDICATOR	ENV.GP. 6:	Air quality
DOMAIN / ACADEMIC CONTENT STANDARD		**Physical Geology**
STANDARD / BENCHMARK	**PG.ER:**	**EARTH'S RESOURCES**
BENCHMARK / GRADE LEVEL INDICATOR	**PG.ER.1 :**	**Energy resources**
PROFICIENCY LEVEL		Renewable and nonrenewable energy sources and efficiency
PROFICIENCY LEVEL		Alternate energy sources and efficiency
PROFICIENCY LEVEL		Resource availability
DOMAIN / ACADEMIC CONTENT STANDARD		**Physical Geology**
STANDARD / BENCHMARK	**PG.ER:**	**EARTH'S RESOURCES**
BENCHMARK / GRADE LEVEL INDICATOR	**PG.ER.2 :**	**Air**

PROFICIENCY LEVEL		Greenhouse gases

DOMAIN / ACADEMIC CONTENT STANDARD		**Physical Science**
STANDARD / BENCHMARK	**PS.M:**	**STUDY OF MATTER**
BENCHMARK / GRADE LEVEL INDICATOR	**PS.M.5:**	**Reactions of matter**
PROFICIENCY LEVEL		Chemical reactions

DOMAIN / ACADEMIC CONTENT STANDARD		**Biology**
STANDARD / BENCHMARK	**B.DI:**	**DIVERSITY AND INDEPENDENCE OF LIFE**
BENCHMARK / GRADE LEVEL INDICATOR	**B.DI.3:**	**Loss of Diversity**
PROFICIENCY LEVEL		Climate change
PROFICIENCY LEVEL		Anthropocene effects

DOMAIN / ACADEMIC CONTENT STANDARD		**Chemistry**
STANDARD / BENCHMARK	**C.IM:**	**INTERACTIONS OF MATTER**
BENCHMARK / GRADE LEVEL INDICATOR	**C.IM.1:**	**Chemical reactions**
PROFICIENCY LEVEL		Types of reactions

Ohio Learning Standards

Science

Grade **12** - Adopted: **2018**

DOMAIN / ACADEMIC CONTENT STANDARD		**Environmental Science**
STANDARD / BENCHMARK		**EARTH SYSTEMS: INTERCONNECTED SPHERES OF EARTH**
BENCHMARK / GRADE LEVEL INDICATOR	**ENV.ES.5:**	**Movement of matter and energy through the hydrosphere, lithosphere, atmosphere and biosphere**

PROFICIENCY LEVEL		Climate
DOMAIN / ACADEMIC CONTENT STANDARD		**Environmental Science**
STANDARD / BENCHMARK		**EARTH'S RESOURCES**
BENCHMARK / GRADE LEVEL INDICATOR	**ENV.ER. 1:**	**Energy resources**
PROFICIENCY LEVEL		Renewable and nonrenewable energy sources and efficiency
PROFICIENCY LEVEL		Alternate energy sources and efficiency
PROFICIENCY LEVEL		Resource availability
DOMAIN / ACADEMIC CONTENT STANDARD		**Environmental Science**
STANDARD / BENCHMARK		**EARTH'S RESOURCES**
BENCHMARK / GRADE LEVEL INDICATOR	**ENV.ER. 2:**	**Air and air pollution**
PROFICIENCY LEVEL		Greenhouse gases
DOMAIN / ACADEMIC CONTENT STANDARD		**Environmental Science**
STANDARD / BENCHMARK	**ENV.GP:**	**GLOBAL ENVIRONMENTAL PROBLEMS AND ISSUES**
BENCHMARK / GRADE LEVEL INDICATOR	ENV.GP. 3:	Climate change
BENCHMARK / GRADE LEVEL INDICATOR	ENV.GP. 4:	Sustainability
BENCHMARK / GRADE LEVEL INDICATOR	ENV.GP. 6:	Air quality
DOMAIN / ACADEMIC CONTENT STANDARD		**Physical Geology**

STANDARD / BENCHMARK	**PG.ER:**	**EARTH'S RESOURCES**
BENCHMARK / GRADE LEVEL INDICATOR	**PG.ER.1:**	**Energy resources**
PROFICIENCY LEVEL		Renewable and nonrenewable energy sources and efficiency
PROFICIENCY LEVEL		Alternate energy sources and efficiency
PROFICIENCY LEVEL		Resource availability
DOMAIN / ACADEMIC CONTENT STANDARD		**Physical Geology**
STANDARD / BENCHMARK	**PG.ER:**	**EARTH'S RESOURCES**
BENCHMARK / GRADE LEVEL INDICATOR	**PG.ER.2:**	**Air**
PROFICIENCY LEVEL		Greenhouse gases
DOMAIN / ACADEMIC CONTENT STANDARD		**Physical Science**
STANDARD / BENCHMARK	**PS.M:**	**STUDY OF MATTER**
BENCHMARK / GRADE LEVEL INDICATOR	**PS.M.5:**	**Reactions of matter**
PROFICIENCY LEVEL		Chemical reactions
DOMAIN / ACADEMIC CONTENT STANDARD		**Biology**
STANDARD / BENCHMARK	**B.DI:**	**DIVERSITY AND INDEPENDENCE OF LIFE**
BENCHMARK / GRADE LEVEL INDICATOR	**B.DI.3:**	**Loss of Diversity**
PROFICIENCY LEVEL		Climate change
PROFICIENCY LEVEL		Anthropocene effects

DOMAIN / ACADEMIC CONTENT STANDARD		**Chemistry**
STANDARD / BENCHMARK	**C.IM:**	**INTERACTIONS OF MATTER**
BENCHMARK / GRADE LEVEL INDICATOR	**C.IM.1:**	**Chemical reactions**
PROFICIENCY LEVEL		Types of reactions

Ohio Learning Standards

Technology Education

Grade **11** - Adopted: **2017**

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	9-12.DT.2.a.	Evaluate a design solution using conceptual, physical, digital and mathematical models at various intervals of the design process in order to check for proper design and note areas where improvements are needed (e.g., check the design solutions against criteria and constraints).
PROFICIENCY LEVEL	9-12.DT.2.b.	Implement, document and present the design process as applied to a particular product, process or problem.

Grade **11** - Adopted: **2022**

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**COMPUTING SYSTEMS**
BENCHMARK / GRADE LEVEL INDICATOR		**Troubleshooting**
PROFICIENCY LEVEL	CS.T.9-12.F.a.	Apply a systemic process to identify problems and take steps to correct them within an integrated computing system.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Algorithms**

PROFICIENCY LEVEL	ATP.A.9-12.F.a.	Define and use appropriate problem solving strategies and visual artifacts to create and refine a solution to a real-world problem.
PROFICIENCY LEVEL	ATP.A.9-12.F.b.	Define and implement an algorithm by decomposing problem requirements from a problem statement to solve a problem.
PROFICIENCY LEVEL	ATP.A.9-12.F.c.	Define and explain iterative algorithms to understand how and when to apply them.
PROFICIENCY LEVEL	ATP.A.9-12.F.d.	Define and explain recursive algorithms to understand how and when to apply them.
DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Modularity**
PROFICIENCY LEVEL	ATP.M.9-12.F.b.	Create computational artifacts by systematically organizing, manipulating and/or processing data.
DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Program Development**
PROFICIENCY LEVEL	ATP.PD.9-12.F.c.	Correctly use consistent naming conventions, version control and comments to demonstrate why these are important for future use, maintenance and reuse of code.
DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**ARTIFICIAL INTELLIGENCE**
BENCHMARK / GRADE LEVEL INDICATOR		**Representation & Reasoning**
PROFICIENCY LEVEL	AI.RR.9-12.F.b.	For each of these types of reasoning problems (classification, prediction, sequential decision-making, combinatorial search, heuristic search, adversarial search, logical deduction and statistical inference), list an algorithm that could be used to solve that problem.
PROFICIENCY LEVEL	AI.RR.9-12.F.c.	Describe the differences between types of search algorithms.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**ARTIFICIAL INTELLIGENCE**
BENCHMARK / GRADE LEVEL INDICATOR		**Machine Learning**
PROFICIENCY LEVEL	AI.ML.9-12.F.b.	Use either a supervised or unsupervised learning algorithm to train a model on real-world data, then evaluate the results.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**ARTIFICIAL INTELLIGENCE**
BENCHMARK / GRADE LEVEL INDICATOR		**Natural Interaction**
PROFICIENCY LEVEL	AI.NI.9-12.F.a.	Construct context-free grammar to parse simple languages and use language-processing tools to construct a chatbot. Use sentiment analysis tools to extract emotional tone from text.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Advanced Level**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Algorithms**
PROFICIENCY LEVEL	ATP.A.9-12.A.a.	Define and explain Iterative and recursive algorithms to understand how and when to apply them.
PROFICIENCY LEVEL	ATP.A.9-12.A.d.	Define and explain sorting and searching algorithms to understand how and when to apply them.
PROFICIENCY LEVEL	ATP.A.9-12.A.f.	Compare and contrast classical, cluster and quantum computing algorithms.

Ohio Learning Standards

Technology Education

Grade **12** - Adopted: **2017**

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	9-12.DT.2.a.	Evaluate a design solution using conceptual, physical, digital and mathematical models at various intervals of the design process in order to check for proper design and note areas where improvements are needed (e.g., check the design solutions against criteria and constraints).
PROFICIENCY LEVEL	9-12.DT.2.b.	Implement, document and present the design process as applied to a particular product, process or problem.

Grade **12** - Adopted: **2022**

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**COMPUTING SYSTEMS**
BENCHMARK / GRADE LEVEL INDICATOR		**Troubleshooting**
PROFICIENCY LEVEL	CS.T.9-12.F.a.	Apply a systemic process to identify problems and take steps to correct them within an integrated computing system.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Algorithms**
PROFICIENCY LEVEL	ATP.A.9-12.F.a.	Define and use appropriate problem solving strategies and visual artifacts to create and refine a solution to a real-world problem.
PROFICIENCY LEVEL	ATP.A.9-12.F.b.	Define and implement an algorithm by decomposing problem requirements from a problem statement to solve a problem.
PROFICIENCY LEVEL	ATP.A.9-12.F.c.	Define and explain iterative algorithms to understand how and when to apply them.
PROFICIENCY LEVEL	ATP.A.9-12.F.d.	Define and explain recursive algorithms to understand how and when to apply them.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Modularity**
PROFICIENCY LEVEL	ATP.M.9-12.F.b.	Create computational artifacts by systematically organizing, manipulating and/or processing data.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Program Development**
PROFICIENCY LEVEL	ATP.PD.9-12.F.c.	Correctly use consistent naming conventions, version control and comments to demonstrate why these are important for future use, maintenance and reuse of code.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**ARTIFICIAL INTELLIGENCE**
BENCHMARK / GRADE LEVEL INDICATOR		**Representation & Reasoning**
PROFICIENCY LEVEL	AI.RR.9-12.F.b.	For each of these types of reasoning problems (classification, prediction, sequential decision-making, combinatorial search, heuristic search, adversarial search, logical deduction and statistical inference), list an algorithm that could be used to solve that problem.
PROFICIENCY LEVEL	AI.RR.9-12.F.c.	Describe the differences between types of search algorithms.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**ARTIFICIAL INTELLIGENCE**
BENCHMARK / GRADE LEVEL INDICATOR		**Machine Learning**
PROFICIENCY LEVEL	AI.ML.9-12.F.b.	Use either a supervised or unsupervised learning algorithm to train a model on real-world data, then evaluate the results.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Foundational Level**
STANDARD / BENCHMARK		**ARTIFICIAL INTELLIGENCE**
BENCHMARK / GRADE LEVEL INDICATOR		**Natural Interaction**
PROFICIENCY LEVEL	AI.NI.9-12.F.a.	Construct context-free grammar to parse simple languages and use language-processing tools to construct a chatbot. Use sentiment analysis tools to extract emotional tone from text.

DOMAIN / ACADEMIC CONTENT STANDARD		**Computer Science, Grade 9-12 Advanced Level**
STANDARD / BENCHMARK		**ALGORITHMIC THINKING AND PROGRAMMING**
BENCHMARK / GRADE LEVEL INDICATOR		**Algorithms**
PROFICIENCY LEVEL	ATP.A.9-12.A.a.	Define and explain Iterative and recursive algorithms to understand how and when to apply them.
PROFICIENCY LEVEL	ATP.A.9-12.A.d.	Define and explain sorting and searching algorithms to understand how and when to apply them.
PROFICIENCY LEVEL	ATP.A.9-12.A.f.	Compare and contrast classical, cluster and quantum computing algorithms.

Oklahoma Academic Standards

Mathematics

Grade **11** - Adopted: **2022**

CONTENT STANDARD / COURSE		**Mathematical Actions and Processes**
STRAND / STANDARD		Develop Accurate and Appropriate Procedural Fluency
STRAND / STANDARD		Develop Strategies for Problem Solving
STRAND / STANDARD		Develop Mathematical Reasoning
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

Mathematics

Grade **12** - Adopted: **2022**

CONTENT STANDARD / COURSE		**Mathematical Actions and Processes**
STRAND / STANDARD		Develop Accurate and Appropriate Procedural Fluency
STRAND / STANDARD		Develop Strategies for Problem Solving
STRAND / STANDARD		Develop Mathematical Reasoning
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 **11** - Adopted: **2020**

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**PHYSICAL SCIENCE (PS)**
OBJECTIVE		**Energy (PS3)**
SKILL / CONCEPT	PS.PS3.3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**PHYSICAL SCIENCE (PS)**

OBJECTIVE		**Waves and Their Applications in Technologies for Information Transfer (PS4)**
SKILL / CONCEPT	PS.PS4.2	Evaluate questions about the advantages and disadvantages of using a digital transmission and storage of information.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**CHEMISTRY (CH)**
OBJECTIVE		**Matter and Its Interactions (PS1)**
SKILL / CONCEPT	CH.PS1.4	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**CHEMISTRY (CH)**
OBJECTIVE		**Energy (PS3)**
SKILL / CONCEPT	CH.PS3.3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**PHYSICS (PH)**
OBJECTIVE		**Energy (PS3)**
SKILL / CONCEPT	PH.PS3.3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**PHYSICS (PH)**
OBJECTIVE		**Waves and Their Applications in Technologies for Information Transfer (PS4)**
SKILL / CONCEPT	PH.PS4.2	Evaluate questions about the advantages and disadvantages of using digital transmission and storage of information.

CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**EARTH AND SPACE SCIENCE (ES)**
OBJECTIVE		**Earth Systems (ESS2)**
SKILL / CONCEPT	ES.ESS2.4	Analyze and interpret data to explore how variations in the flow of energy into and out of Earth's systems causes changes to the atmosphere and climate.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards for Science
STRAND / STANDARD		EARTH AND SPACE SCIENCE (ES)
OBJECTIVE		Earth and Human Activities (ESS3)
SKILL / CONCEPT	ES.ESS3.1	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate effect human activity.
SKILL / CONCEPT	ES.ESS3.2	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios on large and small scales.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards for Science
STRAND / STANDARD		ENVIRONMENTAL SCIENCE (EN)
OBJECTIVE		Ecosystems: Interactions, Energy, and Dynamics (LS2)
SKILL / CONCEPT	EN.LS2.7	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards for Science
STRAND / STANDARD		ENVIRONMENTAL SCIENCE (EN)
OBJECTIVE		Earth Systems (ESS2)
SKILL / CONCEPT	EN.ESS2.4	Analyze and interpret data to explore how variations in the flow of energy into and out of Earth's systems causes changes to the atmosphere and climate.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards for Science
STRAND / STANDARD		ENVIRONMENTAL SCIENCE (EN)
OBJECTIVE		Earth and Human Activities (ESS3)
SKILL / CONCEPT	EN.ESS3.1	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate effect human activity.
SKILL / CONCEPT	EN.ESS3.2	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios on large and small scales.
SKILL / CONCEPT	EN.ESS3.3	Use computational simulations to illustrate changes between the relationships of natural resources, human populations, and biodiversity and their sustainability within Earth systems.
SKILL / CONCEPT	EN.ESS3.4	Evaluate design solutions for a major global or local environmental problem that reduces or stabilizes the impacts of human activities on natural systems.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards for Science
STRAND / STANDARD		PHYSICAL SCIENCE (PS)
OBJECTIVE		Energy (PS3)
SKILL / CONCEPT	PS.PS3.3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards for Science
STRAND / STANDARD		PHYSICAL SCIENCE (PS)
OBJECTIVE		Waves and Their Applications in Technologies for Information Transfer (PS4)
SKILL / CONCEPT	PS.PS4.2	Evaluate questions about the advantages and disadvantages of using a digital transmission and storage of information.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards for Science
STRAND / STANDARD		CHEMISTRY (CH)
OBJECTIVE		Matter and Its Interactions (PS1)
SKILL / CONCEPT	CH.PS1.4	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards for Science
STRAND / STANDARD		CHEMISTRY (CH)
OBJECTIVE		Energy (PS3)
SKILL / CONCEPT	CH.PS3.3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards for Science
STRAND / STANDARD		PHYSICS (PH)
OBJECTIVE		Energy (PS3)
SKILL / CONCEPT	PH.PS3.3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards for Science

STRAND / STANDARD		**PHYSICS (PH)**
OBJECTIVE		**Waves and Their Applications in Technologies for Information Transfer (PS4)**
SKILL / CONCEPT	PH.PS4.2	Evaluate questions about the advantages and disadvantages of using digital transmission and storage of information.
CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**EARTH AND SPACE SCIENCE (ES)**
OBJECTIVE		**Earth Systems (ESS2)**
SKILL / CONCEPT	ES.ESS2.4	Analyze and interpret data to explore how variations in the flow of energy into and out of Earth's systems causes changes to the atmosphere and climate.
CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**EARTH AND SPACE SCIENCE (ES)**
OBJECTIVE		**Earth and Human Activities (ESS3)**
SKILL / CONCEPT	ES.ESS3.1	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate effect human activity.
SKILL / CONCEPT	ES.ESS3.2	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios on large and small scales.
CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**ENVIRONMENTAL SCIENCE (EN)**
OBJECTIVE		**Ecosystems: Interactions, Energy, and Dynamics (LS2)**
SKILL / CONCEPT	EN.LS2.7	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**
STRAND / STANDARD		**ENVIRONMENTAL SCIENCE (EN)**
OBJECTIVE		**Earth Systems (ESS2)**
SKILL / CONCEPT	EN.ESS2.4	Analyze and interpret data to explore how variations in the flow of energy into and out of Earth's systems causes changes to the atmosphere and climate.
CONTENT STANDARD / COURSE		**Oklahoma Academic Standards for Science**

STRAND / STANDARD		**ENVIRONMENTAL SCIENCE (EN)**
OBJECTIVE		**Earth and Human Activities (ESS3)**
SKILL / CONCEPT	EN.ESS3.1	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate effect human activity.
SKILL / CONCEPT	EN.ESS3.2	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios on large and small scales.
SKILL / CONCEPT	EN.ESS3.3	Use computational simulations to illustrate changes between the relationships of natural resources, human populations, and biodiversity and their sustainability within Earth systems.
SKILL / CONCEPT	EN.ESS3.4	Evaluate design solutions for a major global or local environmental problem that reduces or stabilizes the impacts of human activities on natural systems.

Oklahoma Academic Standards

Technology Education

Grade **11** - Adopted: **2023**

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

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

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

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

CONTENT STANDARD / COURSE		Oklahoma Academic Standards - Computer Science
STRAND / STANDARD	L2.	Eleventh and Twelfth Grades: Level 2 (L2)
OBJECTIVE	L2.AP.	Algorithms & Programming (AP)
SKILL / CONCEPT	L2.AP.A.	Algorithms (A)
SKILL	L2.AP.A.01.	Model and use appropriate terminology to describe how artificial intelligence algorithms drive many software and physical systems (e.g., autonomous robots, pattern recognition, text analysis.)
SKILL	L2.AP.A.02.	Develop an artificial intelligence algorithm to play a game against a human opponent or solve a real-world problem.
SKILL	L2.AP.A.03.	Critically examine and trace classic algorithms (e.g., selection sort, insertion sort, binary search, linear search).
SKILL	L2.AP.A.04.	Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency and clarity.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards - Computer Science
STRAND / STANDARD	L2.	Eleventh and Twelfth Grades: Level 2 (L2)
OBJECTIVE	L2.AP.	Algorithms & Programming (AP)
SKILL / CONCEPT	L2.AP.C.	Control (C)
SKILL	L2.AP.C.01.	Model the execution of repetition (e.g., loops, recursion) of an algorithm illustrating output and changes in values of named variables.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards - Computer Science
STRAND / STANDARD	L2.	Eleventh and Twelfth Grades: Level 2 (L2)
OBJECTIVE	L2.AP.	Algorithms & Programming (AP)
SKILL / CONCEPT	L2.AP.M.	Modularity (M)

SKILL	L2.AP.M.01.	Construct solutions to problems using student-created components (e.g., procedures, modules, objects).

Grade **11** - Adopted: **2019**

CONTENT STANDARD / COURSE		**ISTE for Students 2016 (ISTE-S)**
STRAND / STANDARD	**ISTE-S.3.**	**Knowledge Constructor: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
OBJECTIVE	ISTE-S.3.d.	Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

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

CONTENT STANDARD / COURSE		**ISTE for Students 2016 (ISTE-S)**
STRAND / STANDARD	**ISTE-S.5.**	**Computational Thinker: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
OBJECTIVE	ISTE-S.5.a.	Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
OBJECTIVE	ISTE-S.5.b.	Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
OBJECTIVE	ISTE-S.5.d.	Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Oklahoma Academic Standards

Technology Education

Grade **12** - Adopted: **2023**

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

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

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

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

CONTENT STANDARD / COURSE		Oklahoma Academic Standards - Computer Science
STRAND / STANDARD	L2.	Eleventh and Twelfth Grades: Level 2 (L2)
OBJECTIVE	L2.AP.	Algorithms & Programming (AP)
SKILL / CONCEPT	L2.AP.A.	Algorithms (A)
SKILL	L2.AP.A.01.	Model and use appropriate terminology to describe how artificial intelligence algorithms drive many software and physical systems (e.g., autonomous robots, pattern recognition, text analysis.)
SKILL	L2.AP.A.02.	Develop an artificial intelligence algorithm to play a game against a human opponent or solve a real-world problem.
SKILL	L2.AP.A.03.	Critically examine and trace classic algorithms (e.g., selection sort, insertion sort, binary search, linear search).
SKILL	L2.AP.A.04.	Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency and clarity.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards - Computer Science
STRAND / STANDARD	L2.	Eleventh and Twelfth Grades: Level 2 (L2)
OBJECTIVE	L2.AP.	Algorithms & Programming (AP)
SKILL / CONCEPT	L2.AP.C.	Control (C)
SKILL	L2.AP.C.01.	Model the execution of repetition (e.g., loops, recursion) of an algorithm illustrating output and changes in values of named variables.

CONTENT STANDARD / COURSE		Oklahoma Academic Standards - Computer Science
STRAND / STANDARD	L2.	Eleventh and Twelfth Grades: Level 2 (L2)
OBJECTIVE	L2.AP.	Algorithms & Programming (AP)
SKILL / CONCEPT	L2.AP.M.	Modularity (M)
SKILL	L2.AP.M.01.	Construct solutions to problems using student-created components (e.g., procedures, modules, objects).

Grade **12** - Adopted: **2019**

CONTENT STANDARD / COURSE		ISTE for Students 2016 (ISTE-S)
STRAND / STANDARD	ISTE-S.3.	Knowledge Constructor: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
OBJECTIVE	ISTE-S.3.d.	Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

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

CONTENT STANDARD / COURSE		ISTE for Students 2016 (ISTE-S)
STRAND / STANDARD	ISTE-S.5.	Computational Thinker: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
OBJECTIVE	ISTE-S.5.a.	Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

OBJECTIVE	ISTE-S.5.b.	Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
OBJECTIVE	ISTE-S.5.d.	Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Oregon Academic Content Standards

Mathematics

Grade **11** - 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	8	Look for and express regularity in repeated reasoning

STANDARD / CONTENT AREA		High School Standards
CONTENT STANDARD / PROFICIENCY	**HS.AEE.**	**Algebraic Reasoning: Expressions and Equations (HS.AEE)**
BENCHMARK / STRAND	**HS.AEE.D.**	**Make predictions in different applications using expressions, equations, and inequalities to analyze authentic contexts.**
EXPECTATION / BENCHMARK	HS.AEE.D.9.	Understand that the solution to an equation in two variables is a set of points in the coordinate plane that form a curve, which could be a line.

STANDARD / CONTENT AREA		High School Standards
CONTENT STANDARD / PROFICIENCY	**HS.AFN.**	**Algebraic Reasoning: Functions (HS.AFN)**
BENCHMARK / STRAND	**HS.AFN.D.**	**Model a wide variety of authentic situations using functions through the process of making and changing assumptions, assigning variables, and finding solutions to contextual problems.**
EXPECTATION / BENCHMARK	HS.AFN.D.10.	Explain why a situation can be modeled with a linear function, an exponential function, or neither. In a given model, explain the meaning of coefficients and features of functions used, such as slope for a linear model.

Oregon Academic Content Standards

Mathematics

Grade **12** - 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	8	Look for and express regularity in repeated reasoning

STANDARD / CONTENT AREA		High School Standards
CONTENT STANDARD / PROFICIENCY	**HS.AEE.**	**Algebraic Reasoning: Expressions and Equations (HS.AEE)**
BENCHMARK / STRAND	**HS.AEE. D.**	**Make predictions in different applications using expressions, equations, and inequalities to analyze authentic contexts.**
EXPECTATION / BENCHMARK	HS.AEE. D.9.	Understand that the solution to an equation in two variables is a set of points in the coordinate plane that form a curve, which could be a line.

STANDARD / CONTENT AREA		High School Standards
CONTENT STANDARD / PROFICIENCY	**HS.AFN.**	**Algebraic Reasoning: Functions (HS.AFN)**
BENCHMARK / STRAND	**HS.AFN. D.**	**Model a wide variety of authentic situations using functions through the process of making and changing assumptions, assigning variables, and finding solutions to contextual problems.**
EXPECTATION / BENCHMARK	HS.AFN. D.10.	Explain why a situation can be modeled with a linear function, an exponential function, or neither. In a given model, explain the meaning of coefficients and features of functions used, such as slope for a linear model.

Oregon Academic Content Standards

Science

Grade **11** - Adopted: **2022**

STANDARD / CONTENT AREA	OR.HS-LS2.	Ecosystems: Interactions, Energy, and Dynamics

CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
STANDARD / CONTENT AREA	**OR.HS-ESS2.**	**Earth's Systems**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
STANDARD / CONTENT AREA	**OR.HS-ESS3.**	**Earth and Human Activity**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
BENCHMARK / STRAND	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
BENCHMARK / STRAND	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
BENCHMARK / STRAND	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on climate change and other natural systems.
BENCHMARK / STRAND	HS-ESS3-6.	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity (i.e., climate change).
STANDARD / CONTENT AREA	**OR.HS-PS1.**	**Matter and Its Interactions**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.
STANDARD / CONTENT AREA	**OR.HS-PS3.**	**Energy**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

STANDARD / CONTENT AREA	**OR.HS-PS4.**	**Waves and their Applications in Technologies for Information Transfer**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.

STANDARD / CONTENT AREA	**OR.HS-ETS1.**	**Engineering and Design**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-ETS1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
BENCHMARK / STRAND	HS-ETS1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
BENCHMARK / STRAND	HS-ETS1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

STANDARD / CONTENT AREA	**OR.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Key Ideas and Details**
BENCHMARK / STRAND	RST.11-12.2.	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
BENCHMARK / STRAND	RST.11-12.3.	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

STANDARD / CONTENT AREA	**OR.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Craft and Structure**
BENCHMARK / STRAND	RST.11-12.4.	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 11-12 texts and topics.
BENCHMARK / STRAND	RST.11-12.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

STANDARD / CONTENT AREA	**OR.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**

CONTENT STANDARD / PROFICIENCY		**Integration of Knowledge and Ideas**
BENCHMARK / STRAND	RST.11-12.9.	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
STANDARD / CONTENT AREA	**OR.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Range of Reading and Level of Text Complexity**
BENCHMARK / STRAND	RST.11-12.10.	By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.
STANDARD / CONTENT AREA	**OR.WHST.11-12.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Text Types and Purposes**
BENCHMARK / STRAND	**WHST.11-12.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
EXPECTATION / BENCHMARK	WHST.11-12.2(d)	Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.
STANDARD / CONTENT AREA	**OR.WHST.11-12.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Production and Distribution of Writing**
BENCHMARK / STRAND	WHST.11-12.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
BENCHMARK / STRAND	WHST.11-12.6.	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

Oregon Academic Content Standards

Science

Grade **12** - Adopted: **2022**

STANDARD / CONTENT AREA	**OR.HS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
STANDARD / CONTENT AREA	**OR.HS-ESS2.**	**Earth's Systems**

CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-ESS2-4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
STANDARD / CONTENT AREA	**OR.HS-ESS3.**	**Earth and Human Activity**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-ESS3-1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
BENCHMARK / STRAND	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
BENCHMARK / STRAND	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
BENCHMARK / STRAND	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on climate change and other natural systems.
BENCHMARK / STRAND	HS-ESS3-6.	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity (i.e., climate change).
STANDARD / CONTENT AREA	**OR.HS-PS1.**	**Matter and Its Interactions**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-PS1-4.	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.
STANDARD / CONTENT AREA	**OR.HS-PS3.**	**Energy**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-PS3-3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
STANDARD / CONTENT AREA	**OR.HS-PS4.**	**Waves and their Applications in Technologies for Information Transfer**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.

STANDARD / CONTENT AREA	**OR.HS-ETS1.**	**Engineering and Design**
CONTENT STANDARD / PROFICIENCY		**Students who demonstrate understanding can:**
BENCHMARK / STRAND	HS-ETS1-1.	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
BENCHMARK / STRAND	HS-ETS1-2.	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
BENCHMARK / STRAND	HS-ETS1-3.	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
STANDARD / CONTENT AREA	**OR.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Key Ideas and Details**
BENCHMARK / STRAND	RST.11-12.2.	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
BENCHMARK / STRAND	RST.11-12.3.	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
STANDARD / CONTENT AREA	**OR.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Craft and Structure**
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BENCHMARK / STRAND	RST.11-12.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
STANDARD / CONTENT AREA	**OR.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Integration of Knowledge and Ideas**
BENCHMARK / STRAND	RST.11-12.9.	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
STANDARD / CONTENT AREA	**OR.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**

CONTENT STANDARD / PROFICIENCY		**Range of Reading and Level of Text Complexity**
BENCHMARK / STRAND	RST.11-12.10.	By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.

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CONTENT STANDARD / PROFICIENCY		**Text Types and Purposes**
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EXPECTATION / BENCHMARK	WHST.11-12.2(d)	Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.

STANDARD / CONTENT AREA	**OR.WHST.11-12.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONTENT STANDARD / PROFICIENCY		**Production and Distribution of Writing**
BENCHMARK / STRAND	WHST.11-12.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
BENCHMARK / STRAND	WHST.11-12.6.	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.