

Main Criteria: Forward Education
Secondary Criteria: Nebraska Content Area Standards
Subjects: Mathematics, Science, Technology Education
Grades: 11, 12, Key Stage 4

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. Evaluate questions about the advantages of using digital transmission and storage of information.
2.B.

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. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
4.C.

STRAND SC.HS.4. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
4.D.

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. 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.
5.B.

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. Design, evaluate, and refine a solution for increasing the positive impacts of human activities on the environment and biodiversity.
2.E.

CONTENT STANDARD	NE.SC.HS-ESS.	HS Earth and Space Sciences
STRAND	SC.HS.1 2.	Weather and Climate
INDICATOR	SC.HS.1 2.2.	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 Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
.2.B.

CONTENT STANDARD	NE.SC.HS-ESS.	HS Earth and Space Sciences
STRAND	SC.HS.1 5.	Sustainability
INDICATOR	SC.HS.1 5.5.	Gather, analyze, and communicate evidence to describe the interactions between society, environment, and economy.

STRAND SC.HS.15 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.
.5.A.

STRAND SC.HS.15 Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
.5.B.

STRAND SC.HS.15 Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
.5.C.

STRAND SC.HS.15 Evaluate or refine a technological solution that increases positive impacts of human activities on natural systems.
.5.D.

STRAND SC.HS.15 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.
.5.E.

STRAND SC.HS.15 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.
.5.F.

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. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
4.3.C.

STRAND SC.HSP. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
4.3.D.

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.
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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
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STRAND	SC.HSP. 3.	Structure and Properties of Matter
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INDICATOR	SC.HSP. 3.1.	Gather, analyze, and communicate evidence of the structure, properties, and interactions of matter.
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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
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STRAND	SC.HSP. 4.	Energy: Chemistry
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INDICATOR	SC.HSP. 4.2.	Gather, analyze, and communicate evidence of the interactions of energy.
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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.HS P-B.	HS Biology – Plus Standards
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STRAND	SC.HSP. 7.	Interdependent Relationships in Ecosystems
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INDICATOR	SC.HSP. 7.2.	Gather, analyze, and communicate evidence of interdependent relationships in ecosystems.
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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
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STRAND	SC.HS.2.	Waves and Electromagnetic Radiation
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INDICATOR	SC.HS.2 .2.	Gather, analyze, and communicate evidence of the interactions of waves.
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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.1.2.	Weather and Climate
INDICATOR	SC.HS.1.2.2.	Gather, analyze, and communicate evidence to support that Earth's climate and weather are influenced by energy flow through Earth systems.

STRAND SC.HS.1.2.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.1.5.	Sustainability
INDICATOR	SC.HS.1.5.5.	Gather, analyze, and communicate evidence to describe the interactions between society, environment, and economy.

STRAND SC.HS.1.5.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.1.5.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
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STRAND	SC.HSP. 4.	Energy: Chemistry
INDICATOR	SC.HSP. 4.2.	Gather, analyze, and communicate evidence of the interactions of energy.

STRAND SC.HSP. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
4.2.D.

CONTENT STANDARD	NE.SC.HS P-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. Design, evaluate, and refine a solution for increasing the positive impacts of human activities on the environment and biodiversity.
7.2.D.

**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).