

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

Forward Education

Autonomous Electric Vehicles of the Future

South Dakota Content Standards Mathematics

Grade 11 - Adopted: 2018

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

GOAL/STRAND		Algebra I
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INDICATOR/BE NCHMARK	A.CED.	Creating Equations
STANDARD	A.CED.A	Create equations that describe numbers or relationships.

SUPPORTING SKILLS A.CED.A.2. (i) Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

GOAL/STRAND		Algebra I
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INDICATOR/BE NCHMARK	A.REI.	Reasoning with Equations and Inequalities
STANDARD	A.REI.A.	Understand solving equations as a process of reasoning and explain the reasoning.

SUPPORTING SKILLS A.REI.A.1. Explain each step in solving an 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.

GOAL/STRAND		Algebra I
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INDICATOR/BE NCHMARK	F.IF.	Interpreting Functions
STANDARD	F.IF.C.	Analyze functions using different representations.

SUPPORTING SKILLS F.IF.C.7. (i) Graph parent functions and their transformations expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

SUPPORTING SKILLS F.IF.C.7.a Graph linear, exponential, and quadratic functions and show intercepts, maxima, and minima.

GOAL/STRAND		Algebra I
INDICATOR/BENCHMARK	F.LE.	Linear, Quadratic and Exponential Models
STANDARD	F.LE.A.	Construct and compare linear and exponential models and solve problems.
SUPPORTING SKILLS	F.LE.A.1.	Distinguish between situations that can be modeled with linear functions and with exponential functions.

SUPPORTING SKILLS 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.

GOAL/STRAND		Geometry
INDICATOR/BENCHMARK	G.GPE.	Expressing Geometric Properties with Equations
STANDARD	G.GPE.B.	Use coordinates to prove simple geometric theorems algebraically.

SUPPORTING SKILLS G.GPE.B.5. Define and use the slope criteria for parallel and perpendicular lines. (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

GOAL/STRAND		Algebra II
INDICATOR/BENCHMARK	A.CED.	Creating Equations
STANDARD	A.CED.A.	Create equations that describe numbers or relationships.

SUPPORTING SKILLS A.CED.A.2. (ii) Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.*

**South Dakota Content Standards
Mathematics
Grade 12 - Adopted: 2018**

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

GOAL/STRAND		Algebra I
INDICATOR/BE NCHMARK	A.CED.	Creating Equations
STANDARD	A.CED.A	Create equations that describe numbers or relationships.

SUPPORTING SKILLS A.CED.A.2. (i) Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

GOAL/STRAND		Algebra I
INDICATOR/BE NCHMARK	A.REI.	Reasoning with Equations and Inequalities
STANDARD	A.REI.A.	Understand solving equations as a process of reasoning and explain the reasoning.

SUPPORTING SKILLS A.REI.A.1. Explain each step in solving an 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.

GOAL/STRAND		Algebra I
INDICATOR/BE NCHMARK	F.IF.	Interpreting Functions
STANDARD	F.IF.C.	Analyze functions using different representations.

SUPPORTING SKILLS F.IF.C.7. (i) Graph parent functions and their transformations expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

SUPPORTING SKILLS F.IF.C.7.a. Graph linear, exponential, and quadratic functions and show intercepts, maxima, and minima.

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GOAL/STRAND		Algebra II
INDICATOR/BE NCHMARK	A.CED.	Creating Equations

STANDARD	A.CED.A	Create equations that describe numbers or relationships.
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SUPPORTING SKILLS A.CED.A.2. (ii) Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.*

**South Dakota Content Standards
Science
Grade 11 - Adopted: 2015**

GOAL/STRAND	SD.9-12.PSS.	High School Physical Science Standards
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INDICATOR/BE NCHMARK	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. (SEP: 2; DCI: PS1.A, PS1.B; CCC: Energy/Matter)
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INDICATOR/BE NCHMARK	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. (SEP: 6; DCI: PS3.A, PS3.D, ETS1.A; CCC: Energy/Matter, Technology)
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INDICATOR/BE NCHMARK	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information. (SEP: 1; DCI: PS4.A; CCC: Stability/Change, Technology)
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GOAL/STRAND	SD.9-12.LSS.	High School Life Science Standards
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INDICATOR/BE NCHMARK	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. (SEP: 6; DCI: LS2.C, LS4.D, ETS1.B; CCC: Stability/Change)
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GOAL/STRAND	SD.9-12.ESS.	High School Earth and Space Science Standards
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INDICATOR/BE NCHMARK	HS-ESS2-3.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. (SEP: 2; DCI: ESS2.A, ESS2.B, PS4.A; CCC: Energy/Matter, Technology)
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INDICATOR/BE NCHMARK	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. (SEP: 6; DCI: ESS3.A, ESS3.B ; CCC: Cause/Effect, Technology)
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INDICATOR/BE NCHMARK	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. (SEP: 7; DCI: ESS3.A, ETS1.B; CCC: Technology)
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INDICATOR/BE NCHMARK	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity. (SEP: 5; DCI: ESS3.C; CCC: Stability/Change, Technology)
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INDICATOR/BE NCHMARK	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. (SEP: 6; DCI: ESS3.C, ETS1.B; CCC: Stability/Change, Technology)
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INDICATOR/BE NCHMARK	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. (SEP: 5; DCI: ESS2.D, ESS3.D; CCC: Systems)
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Grade 11 - Adopted: 2010

GOAL/STRAND	SD.RST.11-12.	Reading Standards for Literacy in Science and Technical Subjects
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INDICATOR/BE NCHMARK		Key Ideas and Details
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STANDARD	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.
STANDARD	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.
GOAL/STRAND	SD.RST.11-12.	Reading Standards for Literacy in Science and Technical Subjects
INDICATOR/BENCHMARK		Craft and Structure
STANDARD	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.
STANDARD	RST.11-12.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
GOAL/STRAND	SD.RST.11-12.	Reading Standards for Literacy in Science and Technical Subjects
INDICATOR/BENCHMARK		Integration of Knowledge and Ideas
STANDARD	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.
GOAL/STRAND	SD.RST.11-12.	Reading Standards for Literacy in Science and Technical Subjects
INDICATOR/BENCHMARK		Range of Reading and Level of Text Complexity
STANDARD	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.
GOAL/STRAND	SD.WHST.11-12.	Writing Standards for Literacy in Science and Technical Subjects
INDICATOR/BENCHMARK		Text Types and Purposes
STANDARD	WHST.11-12.2.	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
SUPPORTING SKILLS	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.
GOAL/STRAND	SD.WHST.11-12.	Writing Standards for Literacy in Science and Technical Subjects
INDICATOR/BENCHMARK		Production and Distribution of Writing
STANDARD	WHST.11-12.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

STANDARD	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.
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South Dakota Content Standards

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Grade 12 - Adopted: 2015

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-12.6.

**South Dakota Content Standards
Technology Education
Grade 11 - Adopted: 2015**

GOAL/STRAND	SD.ET.	Educational Technology
INDICATOR/BENCHMARK	ET.CT.	9-12 Grade Critical Thinking, Problem Solving, and Decision Making
STANDARD	ET.CT.2	Students demonstrate the design process through problem solving.

SUPPORTING SKILLS 9-12.ET.CT.2.1. Compare and contrast methods for problem-solving and decision-making.

SUPPORTING SKILLS 9-12.ET.CT.2.2. Formulate a technological solution using data-driven decision making.

**South Dakota Content Standards
Technology Education
Grade 12 - Adopted: 2015**

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