

**Main Criteria:** Forward Education  
**Secondary Criteria:** Oregon Academic Content Standards  
**Subjects:** Mathematics, Science, Technology Education  
**Grades:** 11, 12, Key Stage 4

## Forward Education

### Autonomous Electric Vehicles of the Future

#### Oregon Academic Content Standards

##### Mathematics

Grade 11 - Adopted: 2021

STANDARD / CONTENT AREA		Mathematical Practice Standards
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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
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CONTENT STANDARD / PROFICIENCY	HS.AEE.	<b>Algebraic Reasoning: Expressions and Equations (HS.AEE)</b>
BENCHMARK / STRAND	HS.AEE. D.	<b>Make predictions in different applications using expressions, equations, and inequalities to analyze authentic contexts.</b>

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.
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STANDARD / CONTENT AREA		High School Standards
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CONTENT STANDARD / PROFICIENCY	HS.AFN.	<b>Algebraic Reasoning: Functions (HS.AFN)</b>
BENCHMARK / STRAND	HS.AFN. D.	<b>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.</b>

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.
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**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.	<b>Algebraic Reasoning: Expressions and Equations (HS.AEE)</b>
BENCHMARK / STRAND	HS.AEE. D.	<b>Make predictions in different applications using expressions, equations, and inequalities to analyze authentic contexts.</b>

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.
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STANDARD / CONTENT AREA		High School Standards
CONTENT STANDARD / PROFICIENCY	HS.AFN.	<b>Algebraic Reasoning: Functions (HS.AFN)</b>
BENCHMARK / STRAND	HS.AFN. D.	<b>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.</b>

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.
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**Oregon Academic Content Standards**

**Science**

Grade 11 - Adopted: 2022

<b>STANDARD / CONTENT AREA</b>	<b>OR.HS-LS2.</b>	<b>Ecosystems: Interactions, Energy, and Dynamics</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Students who demonstrate understanding can:</b>

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

<b>STANDARD / CONTENT AREA</b>	<b>OR.HS-ESS2.</b>	<b>Earth's Systems</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Students who demonstrate understanding can:</b>

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.

<b>STANDARD / CONTENT AREA</b>	<b>OR.HS-ESS3.</b>	<b>Earth and Human Activity</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Students who demonstrate understanding can:</b>

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).

<b>STANDARD / CONTENT AREA</b>	<b>OR.HS-PS1.</b>	<b>Matter and Its Interactions</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Students who demonstrate understanding can:</b>

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.

<b>STANDARD / CONTENT AREA</b>	<b>OR.HS-PS3.</b>	<b>Energy</b>
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<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Students who demonstrate understanding can:</b>
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.
<b>STANDARD / CONTENT AREA</b>	<b>OR.HS-PS4.</b>	<b>Waves and their Applications in Technologies for Information Transfer</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Students who demonstrate understanding can:</b>
BENCHMARK / STRAND	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.
<b>STANDARD / CONTENT AREA</b>	<b>OR.HS-ETS1.</b>	<b>Engineering and Design</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Students who demonstrate understanding can:</b>
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.
<b>STANDARD / CONTENT AREA</b>	<b>OR.RST.11-12.</b>	<b>Reading Standards for Literacy in Science and Technical Subjects</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Key Ideas and Details</b>
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.
<b>STANDARD / CONTENT AREA</b>	<b>OR.RST.11-12.</b>	<b>Reading Standards for Literacy in Science and Technical Subjects</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Craft and Structure</b>
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.
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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.
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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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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.
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STANDARD / CONTENT AREA	OR.WHS.T.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.
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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.
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**Oregon Academic Content Standards**

**Science**

Grade 12 - Adopted: 2022

STANDARD / CONTENT AREA	OR.HS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
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<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Students who demonstrate understanding can:</b>
BENCHMARK / STRAND	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
<b>STANDARD / CONTENT AREA</b>	<b>OR.HS-ESS2.</b>	<b>Earth's Systems</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Students who demonstrate understanding can:</b>
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.
<b>STANDARD / CONTENT AREA</b>	<b>OR.HS-ESS3.</b>	<b>Earth and Human Activity</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Students who demonstrate understanding can:</b>
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).
<b>STANDARD / CONTENT AREA</b>	<b>OR.HS-PS1.</b>	<b>Matter and Its Interactions</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Students who demonstrate understanding can:</b>
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.
<b>STANDARD / CONTENT AREA</b>	<b>OR.HS-PS3.</b>	<b>Energy</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Students who demonstrate understanding can:</b>

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.	<b>Waves and their Applications in Technologies for Information Transfer</b>
CONTENT STANDARD / PROFICIENCY		<b>Students who demonstrate understanding can:</b>
BENCHMARK / STRAND	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.
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CONTENT STANDARD / PROFICIENCY		<b>Students who demonstrate understanding can:</b>
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.
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<b>STANDARD / CONTENT AREA</b>	<b>OR.RST.11-12.</b>	<b>Reading Standards for Literacy in Science and Technical Subjects</b>
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<b>BENCHMARK / STRAND</b>	<b>WHST.11-12.2.</b>	<b>Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.</b>

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<b>STANDARD / CONTENT AREA</b>	<b>OR.WHST.11-12.</b>	<b>Writing Standards for Literacy in Science and Technical Subjects</b>
<b>CONTENT STANDARD / PROFICIENCY</b>		<b>Production and Distribution of Writing</b>

**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.

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