Forward Education

Autonomous Electric Vehicles of the Future

Hawaii Content and Performance Standards
Mathematics
Grade **11** - Adopted: **2010 (CCSS)**

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

CONTENT STANDARD / COURSE	HI.CC.A.	Algebra
STANDARD / PERFORMANCE INDICATOR / DOMAIN	A-CED.	Creating Equations
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Create equations that describe numbers or relationships.
EXPECTATION / TOPIC	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 / COURSE	HI.CC.A.	Algebra

STANDARD / PERFORMANCE INDICATOR / DOMAIN	A-REI.	Reasoning with Equations and Inequalities
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Understand solving equations as a process of reasoning and explain the reasoning.

EXPECTATION / TOPIC   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 / COURSE	HI.CC.F.	Functions
STANDARD / PERFORMANCE INDICATOR / DOMAIN	F-IF.	Interpreting Functions
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Analyze functions using different representations.
EXPECTATION / TOPIC	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.

PERFORMANCE INDICATOR   F-IF.7(a)   Graph linear and quadratic functions and show intercepts, maxima, and minima.

CONTENT STANDARD / COURSE	HI.CC.F.	Functions
STANDARD / PERFORMANCE INDICATOR / DOMAIN	F-LE.	Linear and Exponential Models
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Construct and compare linear and exponential models and solve problems.
EXPECTATION / TOPIC	F-LE.1.	Distinguish between situations that can be modeled with linear functions and with exponential functions.

PERFORMANCE 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 / COURSE	HI.CC.G.	Geometry
STANDARD / PERFORMANCE INDICATOR / DOMAIN	G-GPE.	Expressing Geometric Properties with Equations
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Use coordinates to prove simple geometric theorems algebraically

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

CONTENT STANDARD / COURSE	HI.CC.A.	Algebra
STANDARD / PERFORMANCE INDICATOR / DOMAIN	A-CED.	Creating Equations
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Create equations that describe numbers or relationships.

EXPECTATION / TOPIC	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 / COURSE	HI.CC.A.	Algebra
STANDARD / PERFORMANCE INDICATOR / DOMAIN	A-REI.	Reasoning with Equations and Inequalities
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Understand solving equations as a process of reasoning and explain the reasoning.

EXPECTATION / TOPIC	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 / COURSE	HI.CC.F.	Functions
STANDARD / PERFORMANCE INDICATOR / DOMAIN	F-IF.	Interpreting Functions
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Analyze functions using different representations.
EXPECTATION / TOPIC	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.
PERFORMANCE INDICATOR	F-IF.7(a)	Graph linear and quadratic functions and show intercepts, maxima, and minima.

CONTENT STANDARD / COURSE	HI.CC.F.	Functions
STANDARD / PERFORMANCE INDICATOR / DOMAIN	F-LE.	Linear and Exponential Models
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Construct and compare linear and exponential models and solve problems.
EXPECTATION / TOPIC	F-LE.1.	Distinguish between situations that can be modeled with linear functions and with exponential functions.
PERFORMANCE 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 / COURSE	HI.CC.G.	Geometry
STANDARD / PERFORMANCE INDICATOR / DOMAIN	G-GPE.	Expressing Geometric Properties with Equations
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Use coordinates to prove simple geometric theorems algebraically

EXPECTATION / TOPIC	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).

Hawaii Content and Performance Standards
Science
Grade **11** - Adopted: **2016**

CONTENT STANDARD / COURSE	NGSS.HS-PS.	PHYSICAL SCIENCE

STANDARD / PERFORMANCE INDICATOR / DOMAIN	HS-PS1.	Matter and Its Interactions
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Students who demonstrate understanding can:

EXPECTATION / TOPIC	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 / COURSE	NGSS.HS-PS.	PHYSICAL SCIENCE
STANDARD / PERFORMANCE INDICATOR / DOMAIN	HS-PS3.	Energy
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Students who demonstrate understanding can:

EXPECTATION / TOPIC	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 / COURSE	NGSS.HS-PS.	PHYSICAL SCIENCE
STANDARD / PERFORMANCE INDICATOR / DOMAIN	HS-PS4.	Waves and Their Applications in Technologies for Information Transfer
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Students who demonstrate understanding can:

EXPECTATION / TOPIC	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.

CONTENT STANDARD / COURSE	NGSS.HS-LS.	LIFE SCIENCE
STANDARD / PERFORMANCE INDICATOR / DOMAIN	HS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Students who demonstrate understanding can:

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

CONTENT STANDARD / COURSE	NGSS.HS-ESS.	EARTH AND SPACE SCIENCE

STANDARD / PERFORMANCE INDICATOR / DOMAIN	HS-ESS2.	Earth's Systems
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Students who demonstrate understanding can:

EXPECTATION / TOPIC	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 / COURSE	NGSS.HS-ESS.	EARTH AND SPACE SCIENCE
STANDARD / PERFORMANCE INDICATOR / DOMAIN	HS-ESS3.	Earth and Human Activity
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Students who demonstrate understanding can:

EXPECTATION / TOPIC	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 / TOPIC	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
EXPECTATION / TOPIC	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
EXPECTATION / TOPIC	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
EXPECTATION / TOPIC	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 / COURSE	NGSS.HS-ETS.	ENGINEERING DESIGN
STANDARD / PERFORMANCE INDICATOR / DOMAIN	HS-ETS1.	Engineering Design
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Students who demonstrate understanding can:

EXPECTATION / TOPIC	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 / TOPIC	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 / TOPIC	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.

Hawaii Content and Performance Standards
Science
Grade **12** - Adopted: **2016**

CONTENT STANDARD / COURSE	NGSS.HS -PS.	PHYSICAL SCIENCE
STANDARD / PERFORMANCE INDICATOR / DOMAIN	HS-PS1.	Matter and Its Interactions
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Students who demonstrate understanding can:

EXPECTATION / TOPIC	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 / COURSE	NGSS.HS -PS.	PHYSICAL SCIENCE
STANDARD / PERFORMANCE INDICATOR / DOMAIN	HS-PS3.	Energy
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Students who demonstrate understanding can:

EXPECTATION / TOPIC	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 / COURSE	NGSS.HS -PS.	PHYSICAL SCIENCE
STANDARD / PERFORMANCE INDICATOR / DOMAIN	HS-PS4.	Waves and Their Applications in Technologies for Information Transfer
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Students who demonstrate understanding can:

EXPECTATION / TOPIC	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.

CONTENT STANDARD / COURSE	NGSS.HS -LS.	LIFE SCIENCE
STANDARD / PERFORMANCE INDICATOR / DOMAIN	HS-LS2.	Ecosystems: Interactions, Energy, and Dynamics

INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		**Students who demonstrate understanding can:**
EXPECTATION / TOPIC	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
CONTENT STANDARD / COURSE	**NGSS.HS-ESS.**	**EARTH AND SPACE SCIENCE**
STANDARD / PERFORMANCE INDICATOR / DOMAIN	**HS-ESS2.**	**Earth's Systems**
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		**Students who demonstrate understanding can:**
EXPECTATION / TOPIC	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 / COURSE	**NGSS.HS-ESS.**	**EARTH AND SPACE SCIENCE**
STANDARD / PERFORMANCE INDICATOR / DOMAIN	**HS-ESS3.**	**Earth and Human Activity**
INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		**Students who demonstrate understanding can:**
EXPECTATION / TOPIC	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 / TOPIC	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
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EXPECTATION / TOPIC	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
EXPECTATION / TOPIC	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 / COURSE	**NGSS.HS-ETS.**	**ENGINEERING DESIGN**
STANDARD / PERFORMANCE INDICATOR / DOMAIN	**HS-ETS1.**	**Engineering Design**

INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK		Students who demonstrate understanding can:
EXPECTATION / TOPIC	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 / TOPIC	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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