Forward Education

<div align="center">Autonomous Electric Vehicles of the Future</div>

Maine Learning Results
Mathematics
Grade **11** - Adopted: **2020/Implemented 2020**

STRAND / DOMAIN		Standards for Mathematical Practice
CATEGORY / PERFORMANCE INDICATOR	MP1.	Make sense of problems and persevere in solving them: Students will plan strategies to use and persevere in solving math problems.
CATEGORY / PERFORMANCE INDICATOR	MP2.	Reason abstractly and quantitatively: Students will think about numbers in many ways and make sense of numerical relationships as they solve problems.
CATEGORY / PERFORMANCE INDICATOR	MP3.	Construct viable arguments and critique the reasoning of others: Students will explain their thinking and make sense of the thinking of others.
CATEGORY / PERFORMANCE INDICATOR	MP4.	Model with mathematics: Students will use representations to show their thinking in a variety of ways.
CATEGORY / PERFORMANCE INDICATOR	MP8.	Look for and express regularity in repeated reasoning: Students will look for patterns and rules to help create general methods and shortcuts that can be applied to similar mathematical problems.

STRAND / DOMAIN		Algebraic Reasoning – Algebra: Creating Equations and/or Inequalities
CATEGORY / PERFORMANCE INDICATOR	**AR.A.7**	**Create equations and/or inequalities that describe numbers or relationships.**
STANDARD	HSA.CED.A.2:	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

STRAND / DOMAIN		Algebraic Reasoning – Algebra: Reasoning with Equations & Inequalities
CATEGORY / PERFORMANCE INDICATOR	**AR.A.8**	**Understand solving equations as a process of reasoning and explain the reasoning.**
STANDARD	HSA.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 or refute a solution method.

STRAND / DOMAIN		Algebraic Reasoning – Functions: Interpreting Functions

CATEGORY / PERFORMANCE INDICATOR	AR.A.14	Analyze functions using different representations.
STANDARD	HSF.IF.C.7:	Graph functions expressed symbolically as well as show and describe key features of the graph, by hand in simple cases and using technology for more complicated cases.

EXPECTATION	HSF.IF.C.7a:	Graph linear and quadratic functions and show intercepts, maxima, and minima.

STRAND / DOMAIN		Algebraic Reasoning – Functions: Linear, Quadratic, & Exponential Models
CATEGORY / PERFORMANCE INDICATOR	AR.A.17	Construct and compare linear, quadratic, and exponential models and solve problems.
STANDARD	HSF.LE.A.1:	Distinguish between situations that can be modeled with linear functions and with exponential functions.

EXPECTATION	HSF.LE.A.1a:	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

STRAND / DOMAIN		Geometric Reasoning – Geometry: Expressing Geometric Properties with Equations
CATEGORY / PERFORMANCE INDICATOR	GR.A.12	Use coordinates to prove simple geometric theorems algebraically.

STANDARD	HSG.GPE.B.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).

Maine Learning Results
Mathematics
Grade **12** - Adopted: **2020/Implemented 2020**

STRAND / DOMAIN		Standards for Mathematical Practice
CATEGORY / PERFORMANCE INDICATOR	MP1.	Make sense of problems and persevere in solving them: Students will plan strategies to use and persevere in solving math problems.
CATEGORY / PERFORMANCE INDICATOR	MP2.	Reason abstractly and quantitatively: Students will think about numbers in many ways and make sense of numerical relationships as they solve problems.
CATEGORY / PERFORMANCE INDICATOR	MP3.	Construct viable arguments and critique the reasoning of others: Students will explain their thinking and make sense of the thinking of others.
CATEGORY / PERFORMANCE INDICATOR	MP4.	Model with mathematics: Students will use representations to show their thinking in a variety of ways.
CATEGORY / PERFORMANCE INDICATOR	MP8.	Look for and express regularity in repeated reasoning: Students will look for patterns and rules to help create general methods and shortcuts that can be applied to similar mathematical problems.

STRAND / DOMAIN		Algebraic Reasoning – Algebra: Creating Equations and/or Inequalities
CATEGORY / PERFORMANCE INDICATOR	AR.A.7	Create equations and/or inequalities that describe numbers or relationships.

STANDARD	HSA.CED.A.2:	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

STRAND / DOMAIN		Algebraic Reasoning – Algebra: Reasoning with Equations & Inequalities
CATEGORY / PERFORMANCE INDICATOR	AR.A.8	Understand solving equations as a process of reasoning and explain the reasoning.

STANDARD	HSA.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 or refute a solution method.

STRAND / DOMAIN		Algebraic Reasoning – Functions: Interpreting Functions
CATEGORY / PERFORMANCE INDICATOR	AR.A.14	Analyze functions using different representations.
STANDARD	HSF.IF.C.7:	Graph functions expressed symbolically as well as show and describe key features of the graph, by hand in simple cases and using technology for more complicated cases.

EXPECTATION	HSF.IF.C.7a:	Graph linear and quadratic functions and show intercepts, maxima, and minima.

STRAND / DOMAIN		Algebraic Reasoning – Functions: Linear, Quadratic, & Exponential Models
CATEGORY / PERFORMANCE INDICATOR	AR.A.17	Construct and compare linear, quadratic, and exponential models and solve problems.
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STRAND / DOMAIN		Geometric Reasoning – Geometry: Expressing Geometric Properties with Equations
CATEGORY / PERFORMANCE INDICATOR	GR.A.12	Use coordinates to prove simple geometric theorems algebraically.

STANDARD	HSG.GPE.B.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).

Maine Learning Results
Science
Grade **11** - Adopted: **2019**

STRAND / DOMAIN	NGSS.HS-PS.	PHYSICAL SCIENCE

CATEGORY / PERFORMANCE INDICATOR	HS-PS1.	Matter and Its Interactions
STANDARD		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 / DOMAIN	NGSS.HS-PS.	PHYSICAL SCIENCE
CATEGORY / PERFORMANCE INDICATOR	HS-PS3.	Energy
STANDARD		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 / DOMAIN	NGSS.HS-PS.	PHYSICAL SCIENCE
CATEGORY / PERFORMANCE INDICATOR	HS-PS4.	Waves and Their Applications in Technologies for Information Transfer
STANDARD		Students who demonstrate understanding can:

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

STRAND / DOMAIN	NGSS.HS-LS.	LIFE SCIENCE
CATEGORY / PERFORMANCE INDICATOR	HS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
STANDARD		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 / DOMAIN	NGSS.HS-ESS.	EARTH AND SPACE SCIENCE
CATEGORY / PERFORMANCE INDICATOR	HS-ESS2.	Earth's Systems
STANDARD		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 / DOMAIN	NGSS.HS-ESS.	EARTH AND SPACE SCIENCE
CATEGORY / PERFORMANCE INDICATOR	HS-ESS3.	Earth and Human Activity
STANDARD		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 / DOMAIN	NGSS.HS-ETS.	ENGINEERING DESIGN
CATEGORY / PERFORMANCE INDICATOR	HS-ETS1.	Engineering Design
STANDARD		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.

Maine Learning Results
Science
Grade **12** - Adopted: **2019**

STRAND / DOMAIN	NGSS.HS-PS.	PHYSICAL SCIENCE
CATEGORY / PERFORMANCE INDICATOR	HS-PS1.	Matter and Its Interactions
STANDARD		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 / DOMAIN	NGSS.HS-PS.	PHYSICAL SCIENCE
CATEGORY / PERFORMANCE INDICATOR	HS-PS3.	Energy
STANDARD		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 / DOMAIN	NGSS.HS -PS.	PHYSICAL SCIENCE
CATEGORY / PERFORMANCE INDICATOR	HS-PS4.	Waves and Their Applications in Technologies for Information Transfer
STANDARD		Students who demonstrate understanding can:

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

STRAND / DOMAIN	NGSS.HS -LS.	LIFE SCIENCE
CATEGORY / PERFORMANCE INDICATOR	HS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
STANDARD		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 / DOMAIN	NGSS.HS -ESS.	EARTH AND SPACE SCIENCE
CATEGORY / PERFORMANCE INDICATOR	HS-ESS2.	Earth's Systems
STANDARD		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 / DOMAIN	NGSS.HS -ESS.	EARTH AND SPACE SCIENCE
CATEGORY / PERFORMANCE INDICATOR	HS-ESS3.	Earth and Human Activity
STANDARD		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 / DOMAIN	NGSS.HS-ETS.	ENGINEERING DESIGN
CATEGORY / PERFORMANCE INDICATOR	HS-ETS1.	**Engineering Design**
STANDARD		**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.

STRAND / DOMAIN	NGSS.HS-ETS.	ENGINEERING DESIGN
CATEGORY / PERFORMANCE INDICATOR	HS-ETS1.	**Engineering Design**
STANDARD		**Students who demonstrate understanding can:**