# Main Criteria: Forward Education

Secondary Criteria: Alabama Courses of Study

Subjects: Mathematics, Science, Technology Education

Grades: 11, 12, Key Stage 4

# **Forward Education**

### Autonomous Electric Vehicles of the Future

### Alabama Courses of Study

Mathematics

### Grade 11 - Adopted: 2019/Impl. 2020

STRAND / DOMAIN		Mathematical Practices
OBJECTIVE / CATEGORY	MP1	Make sense of problems and persevere in solving them.
OBJECTIVE / CATEGORY	MP2	Reason abstractly and quantitatively.
OBJECTIVE / CATEGORY	MP3	Construct viable arguments and critique the reasoning of others.
OBJECTIVE / CATEGORY	MP4	Model with mathematics.
OBJECTIVE / CATEGORY	MP8	Look for and express regularity in repeated reasoning.

STRAND / DOMAIN		Geometry with Data Analysis Content Standards
OBJECTIVE / CATEGORY		Algebra and Functions - Focus 2: Connecting Algebra to Functions
STANDARD		Graphs can be used to obtain exact or approximate solutions of equations, inequalities, and systems of equations and inequalities—including systems of linear equations in two variables and systems of linear and quadratic equations (given or obtained by using technology).
RELATED	5.	Verify that the graph of a linear equation in two variables is the set of all its solutions plotted in the coordinate plane

RELATED	5.	verify that the graph of a linear equation in two variables is the set of all its solutions plotted in the coordinate plane,
CONTENT /		which forms a line.
EXPECTATION		

STRAND / DOMAIN		Algebra I with Probability Content Standards
OBJECTIVE / CATEGORY		Algebra and Functions - Focus 1: Algebra
STANDARD		Expressions, equations, and inequalities can be used to analyze and make predictions, both within mathematics and as mathematics is applied in different contexts – in particular, contexts that arise in relation to linear, quadratic, and exponential situations.
RELATED CONTENT / EXPECTATION	12.	Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.
STRAND / DOMAIN		Algebra I with Probability Content Standards

OBJECTIVE / CATEGORY		Algebra and Functions - Focus 2: Connecting Algebra to Functions
STANDARD		Graphs can be used to obtain exact or approximate solutions of equations, inequalities, and systems of equations and inequalities – including systems of linear equations in two variables and systems of linear and quadratic equations (given or obtained by using technology).
RELATED CONTENT / EXPECTATION	19.	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$ .
GRADE EXPECTATION	19.a.	Find the approximate solutions of an equation graphically, using tables of values, or finding successive approximations, using technology where appropriate. Note: Include cases where f(x) is a linear, quadratic, exponential, or absolute value function and g(x) is constant or linear.

STRAND / DOMAIN		Algebra I with Probability Content Standards
OBJECTIVE / CATEGORY		Algebra and Functions - Focus 3: Functions
STANDARD		Functions that are members of the same family have distinguishing attributes (structure) common to all functions within that family.
RELATED CONTENT / EXPECTATION	24.	Distinguish between situations that can be modeled with linear functions and those that can be modeled with exponential functions.

GRADE24.b.Define linear functions to represent situations in which one quantity changes at a constant rate per unit intervalEXPECTATIONrelative to another.

STRAND / DOMAIN		Algebra I with Probability Content Standards
OBJECTIVE / CATEGORY		Algebra and Functions - Focus 3: Functions
STANDARD		Functions that are members of the same family have distinguishing attributes (structure) common to all functions within that family.
RELATED CONTENT / EXPECTATION	27.	Interpret the parameters of functions in terms of a context. Extend from linear functions, written in the form mx + b, to exponential functions, written in the form ab^x.

STRAND / DOMAIN		Algebra I with Probability Content Standards
OBJECTIVE / CATEGORY		Algebra and Functions - Focus 3: Functions
STANDARD		Functions can be represented graphically and key features of the graphs, including zeros, intercepts, and, when relevant, rate of change and maximum/minimum values, can be associated with and interpreted in terms of the equivalent symbolic representation.
RELATED CONTENT / EXPECTATION	30.	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
GRADE EXPECTATION	30.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima.

STRAND / DOMAIN	Algebra I with Probability Content Standards
OBJECTIVE / CATEGORY	Algebra and Functions - Focus 3: Functions

STANDARD		Functions model a wide variety of real situations and can help students understand the processes of making and changing assumptions, assigning variables, and finding solutions to contextual problems.
RELATED CONTENT / EXPECTATION	31.	Use the mathematical modeling cycle to solve real-world problems involving linear, quadratic, exponential, absolute value, and linear piecewise functions.

STRAND / DOMAIN		Mathematical Modeling Content Standards
OBJECTIVE / CATEGORY		Modeling
STANDARD		Mathematical modeling and statistical problem-solving are extensive, cyclical processes that can be used to answer significant real-world problems.
RELATED CONTENT /	1.	Use the full Mathematical Modeling Cycle or Statistical Problem-Solving Cycle to answer a real-world problem of particular student interest, incorporating standards from across the course.

EXPECTATION

STRAND / DOMAIN		Mathematical Modeling Content Standards
OBJECTIVE / CATEGORY		Financial Planning and Management
STANDARD		Mathematical models involving growth and decay are useful in solving real-world problems involving borrowing and investing; spreadsheets are a frequently-used and powerful tool to assist with modeling financial situations.
RELATED	2.	Use elements of the Mathematical Modeling Cycle to solve real-world problems involving finances.

RELATED CONTENT / Use elements of the Mathematical Modeling Cycle to solve real-world problems involving finances.

EXPECTATION

# Alabama Courses of Study Mathematics

Grade 12 - Adopted: 2019/Impl. 2020

STRAND / DOMAIN		Mathematical Practices
OBJECTIVE / CATEGORY	MP1	Make sense of problems and persevere in solving them.
OBJECTIVE / CATEGORY	MP2	Reason abstractly and quantitatively.
OBJECTIVE / CATEGORY	MP3	Construct viable arguments and critique the reasoning of others.
OBJECTIVE / CATEGORY	MP4	Model with mathematics.
OBJECTIVE / CATEGORY	MP8	Look for and express regularity in repeated reasoning.
STRAND / DOMAIN		Geometry with Data Analysis Content Standards
OBJECTIVE / CATEGORY		Algebra and Functions - Focus 2: Connecting Algebra to Functions

STANDARD		Graphs can be used to obtain exact or approximate solutions of equations, inequalities, and systems of equations and inequalities—including systems of linear equations in two variables and systems of linear and quadratic equations (given or obtained by using technology).
RELATED CONTENT / EXPECTATION	5.	Verify that the graph of a linear equation in two variables is the set of all its solutions plotted in the coordinate plane, which forms a line.

STRAND / DOMAIN	Algebra I with Probability Content Standards
OBJECTIVE / CATEGORY	Algebra and Functions - Focus 1: Algebra
STANDARD	Expressions, equations, and inequalities can be used to analyze and make predictions, both within mathematics and as mathematics is applied in different contexts – in particular, contexts that arise in relation to linear, quadratic, and exponential situations.

RELATED12.Create equations in two or more variables to represent relationships between quantities in context; graph equationsCONTENT /on coordinate axes with labels and scales and use them to make predictions. Limit to contexts arising from linear,EXPECTATIONquadratic, exponential, absolute value, and linear piecewise functions.

STRAND / DOMAIN		Algebra I with Probability Content Standards
OBJECTIVE / CATEGORY		Algebra and Functions - Focus 2: Connecting Algebra to Functions
STANDARD		Graphs can be used to obtain exact or approximate solutions of equations, inequalities, and systems of equations and inequalities – including systems of linear equations in two variables and systems of linear and quadratic equations (given or obtained by using technology).
RELATED CONTENT / EXPECTATION	19.	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$ .
GRADE EXPECTATION	19.a.	Find the approximate solutions of an equation graphically, using tables of values, or finding successive approximations, using technology where appropriate. Note: Include cases where f(x) is a linear, quadratic, exponential, or absolute value function and g(x) is constant or linear.

STRAND / DOMAIN		Algebra I with Probability Content Standards
OBJECTIVE / CATEGORY		Algebra and Functions - Focus 3: Functions
STANDARD		Functions that are members of the same family have distinguishing attributes (structure) common to all functions within that family.
RELATED CONTENT / EXPECTATION	24.	Distinguish between situations that can be modeled with linear functions and those that can be modeled with exponential functions.
GRADE EXPECTATION	24.b.	Define linear functions to represent situations in which one quantity changes at a constant rate per unit interval relative to another.
STRAND /		Algebra I with Probability Content Standards

DOMAIN	
OBJECTIVE / CATEGORY	Algebra and Functions - Focus 3: Functions
STANDARD	Functions that are members of the same family have distinguishing attributes (structure) common to all functions within that family.

RELATED	27.
CONTENT /	
EXPECTATION	

STRAND /<br/>DOMAINAlgebra I with Probability Content StandardsOBJECTIVE /<br/>CATEGORYAlgebra and Functions - Focus 3: FunctionsST ANDARDFunctions can be represented graphically and key features of the graphs, including zeros, intercepts,<br/>and, when relevant, rate of change and maximum/minimum values, can be associated with and<br/>interpreted in terms of the equivalent symbolic representation.RELATED<br/>CONTENT /<br/>EXPECT ATION30.Graph functions expressed symbolically and show key features of the graph, by hand in simple cases

exponential functions, written in the form ab^x.

Interpret the parameters of functions in terms of a context. Extend from linear functions, written in the form mx + b, to

GRADE EXPECTATION 30.a.

Graph linear and quadratic functions and show intercepts, maxima, and minima.

STRAND / DOMAIN		Algebra I with Probability Content Standards
OBJECTIVE / CATEGORY		Algebra and Functions - Focus 3: Functions
STANDARD		Functions model a wide variety of real situations and can help students understand the processes of making and changing assumptions, assigning variables, and finding solutions to contextual problems.
RELATED	31.	Use the mathematical modeling cycle to solve real-world problems involving linear, quadratic, exponential, absolute

CONTENT / value, and linear piecewise functions. EXPECTATION

STRAND / DOMAIN		Mathematical Modeling Content Standards
OBJECTIVE / CATEGORY		Modeling
STANDARD		Mathematical modeling and statistical problem-solving are extensive, cyclical processes that can be used to answer significant real-world problems.
RELATED CONTENT / EXPECTATION	1.	Use the full Mathematical Modeling Cycle or Statistical Problem-Solving Cycle to answer a real-world problem of particular student interest, incorporating standards from across the course.

STRAND / DOMAIN	Mathematical Modeling Content Standards
OBJECTIVE / CATEGORY	Financial Planning and Management
STANDARD	Mathematical models involving growth and decay are useful in solving real-world problems involving borrowing and investing; spreadsheets are a frequently-used and powerful tool to assist with modeling financial situations.

RELATED CONTENT / EXPECTATION 2.

Use elements of the Mathematical Modeling Cycle to solve real-world problems involving finances.

Alabama Courses of Study Science Grade 11 - Adopted: 2015

STRAND / DOMAIN	AL.HS.PS	PHYSICAL SCIENCE
OBJECTIVE / CATEGORY		Matter and Its Interactions

STANDARD

HS.PS.3. Analyze and interpret data from a simple chemical reaction or combustion reaction involving main group elements.

STRAND / DOMAIN	AL.HS.PS	PHYSICAL SCIENCE
OBJECTIVE / CATEGORY		Waves and Their Applications in Technologies for Information Transfer
STANDARD	HS.PS.1 5.	Obtain and communicate information from published materials to explain how transmitting and receiving devices (e.g., cellular telephones, medical-imaging technology, solar cells, wireless Internet, scanners, Sound Navigation and

(e.g., cellular telephones, medical-imaging technology, solar cells, wireless Internet, scanners, Sound Navigation and Ranging [SONAR]) use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

STRAND / DOMAIN	AL.HS.C.	CHEMISTRY
OBJECTIVE / CATEGORY		Energy
STANDARD	HS.C.11	Construct an explanation that describes how the release or absorption of energy from a system depends upon changes in the components of the system.
RELATED CONTENT / EXPECTATION	HS.C.11. a.	Develop a model to illustrate how the changes in total bond energy determine whether a chemical reaction is endothermic or exothermic.

STRAND / DOMAIN	AL.HS.ES	ENVIRONMENT AL SCIENCE
OBJECTIVE / CATEGORY		Earth and Human Activity
STANDARD	HS.ES.1.	Investigate and analyze the use of nonrenewable energy sources (e.g., fossil fuels, nuclear, natural gas) and renewable energy sources (e.g., solar, wind, hydroelectric, geothermal) and propose solutions for their impact on the environment.
STANDARD	HS.ES.12	Analyze and interpret data and climate models to predict how global or regional climate change can affect Earth's systems (e.g., precipitation and temperature and their associated impacts on sea level, glacial ice volumes, and atmosphere and ocean composition).
STANDARD	HS.ES.13	Obtain, evaluate, and communicate information based on evidence to explain how key natural resources (e.g., water sources, fertile soils, concentrations of minerals and fossil fuels), natural hazards, and climate changes influence human activity (e.g., mass migrations).
STANDARD	HS.ES.14	Analyze cost-benefit ratios of competing solutions for developing, conserving, managing, recycling, and reusing energy and mineral resources to minimize impacts in natural systems (e.g., determining best practices for agricultural soil use, mining for coal, and exploring for petroleum and natural gas sources).
STANDARD	HS.ES.15	Construct an explanation based on evidence to determine the relationships among management of natural resources, human sustainability, and biodiversity (e.g., resources, waste management, per capita consumption, agricultural efficiency, urban planning).

STRAND / DOMAIN	AL.RH.11 -12.	Reading Standards for Literacy in Science and Technical Subjects
OBJECTIVE / CATEGORY		Key Ideas and Details
STANDARD	RH.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	RH.11- 12.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
STRAND / DOMAIN	AL.RH.11 -12.	Reading Standards for Literacy in Science and Technical Subjects
OBJECTIVE / CATEGORY		Craft and Structure
STANDARD	RH.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	RH.11- 12.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
STRAND / DOMAIN	AL.RH.11 -12.	Reading Standards for Literacy in Science and Technical Subjects
OBJECTIVE / CATEGORY		Integration of Knowledge and Ideas
STANDARD	RH.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.
STRAND / DOMAIN	AL.RH.11 -12.	Reading Standards for Literacy in Science and Technical Subjects
OBJECTIVE / CATEGORY		Range of Reading and Level of Text Complexity
STANDARD	RH.11- 12.10.	By the end of Grade 12, read and comprehend science/technical texts in the Grades 11-CCR text complexity band independently and proficiently.
STRAND / DOMAIN	AL.WHST 11-12.	Writing Standards for Literacy in Science, and Technical Subjects.
OBJECTIVE / CATEGORY		Text Types and Purposes
STANDARD	WHST.1 1-12.2.	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
RELATED CONTENT / EXPECTATION	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.
STRAND / DOMAIN	AL.WHST .11-12.	Writing Standards for Literacy in Science, and Technical Subjects
OBJECTIVE / CATEGORY		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	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in

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WHST.11 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in-12.6. response to ongoing feedback, including new arguments or information.

### Alabama Courses of Study

Science

Grade 12 - Adopted: 2015

STRAND / DOMAIN	AL.HS.PS	PHYSICAL SCIENCE
OBJECTIVE / CATEGORY		Matter and Its Interactions
STANDARD	HS.PS.3.	Analyze and interpret data from a simple chemical reaction or combustion reaction involving main group elements.

STRAND / DOMAIN	AL.HS.PS	PHYSICAL SCIENCE
OBJECTIVE / CATEGORY		Waves and Their Applications in Technologies for Information Transfer
STANDARD	HS.PS.1 5.	Obtain and communicate information from published materials to explain how transmitting and receiving devices (e.g., cellular telephones, medical-imaging technology, solar cells, wireless Internet, scanners, Sound Navigation and Ranging [SONAR]) use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

STRAND / DOMAIN	AL.HS.C.	CHEMISTRY
OBJECTIVE / CATEGORY		Energy
STANDARD	HS.C.11	Construct an explanation that describes how the release or absorption of energy from a system depends upon changes in the components of the system.
RELATED	HS.C.11.	Develop a model to illustrate how the changes in total bond energy determine whether a chemical reaction is

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STRAND / DOMAIN	AL.HS.ES	ENVIRONMENT AL SCIENCE
OBJECTIVE / CATEGORY		Earth and Human Activity
STANDARD	HS.ES.1.	Investigate and analyze the use of nonrenewable energy sources (e.g., fossil fuels, nuclear, natural gas) and renewable energy sources (e.g., solar, wind, hydroelectric, geothermal) and propose solutions for their impact on the environment.
STANDARD	HS.ES.12	Analyze and interpret data and climate models to predict how global or regional climate change can affect Earth's systems (e.g., precipitation and temperature and their associated impacts on sea level, glacial ice volumes, and atmosphere and ocean composition).
STANDARD	HS.ES.13	Obtain, evaluate, and communicate information based on evidence to explain how key natural resources (e.g., water sources, fertile soils, concentrations of minerals and fossil fuels), natural hazards, and climate changes influence human activity (e.g., mass migrations).

STANDARD	HS.ES.14	Analyze cost-benefit ratios of competing solutions for developing, conserving, managing, recycling, and reusing energy and mineral resources to minimize impacts in natural systems (e.g., determining best practices for agricultural soil use, mining for coal, and exploring for petroleum and natural gas sources).
STANDARD	HS.ES.15	Construct an explanation based on evidence to determine the relationships among management of natural resources, human sustainability, and biodiversity (e.g., resources, waste management, per capita consumption, agricultural efficiency, urban planning).
		Grade 12 - Adopted: 2014
STRAND / DOMAIN	AL.RH.11 -12.	Reading Standards for Literacy in Science and Technical Subjects
OBJECTIVE / CATEGORY		Key Ideas and Details
STANDARD	RH.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	RH.11- 12.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
STRAND / DOMAIN	AL.RH.11 -12.	Reading Standards for Literacy in Science and Technical Subjects
OBJECTIVE / CATEGORY		Craft and Structure
STANDARD	RH.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	RH.11- 12.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
STRAND / DOMAIN	AL.RH.11 -12.	Reading Standards for Literacy in Science and Technical Subjects
OBJECTIVE / CATEGORY		Integration of Knowledge and Ideas
STANDARD	RH.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.
STRAND / DOMAIN	AL.RH.11 -12.	Reading Standards for Literacy in Science and Technical Subjects
OBJECTIVE / CATEGORY		Range of Reading and Level of Text Complexity
STANDARD	RH.11- 12.10.	By the end of Grade 12, read and comprehend science/technical texts in the Grades 11-CCR text complexity band independently and proficiently.
STRAND / DOMAIN	AL.WHST 11-12.	Writing Standards for Literacy in Science, and Technical Subjects
OBJECTIVE / CATEGORY		Text Types and Purposes
STANDARD	WHST.1 1-12.2.	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

RELATED	WHST.11	Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to
CONTENT /	-12.2.d.	manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and
EXPECTATION		context as well as to the expertise of likely readers.

STRAND / DOMAIN	AL.WHST .11-12.	Writing Standards for Literacy in Science, and Technical Subjects
OBJECTIVE / CATEGORY		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.

## Alabama Courses of Study Technology Education Grade 11 - Adopted: 2018

STRAND / DOMAIN	AL.DLCS. 9-12.	Digital Literacy and Computer Science
OBJECTIVE / CATEGORY	9-12.1.	Computational Thinker
STANDARD		Algorithms
RELATED CONTENT / EXPECTATION	9-12.1.3.	Differentiate between a generalized expression of an algorithm in pseudocode and its concrete implementation in a programming language.
GRADE EXPECTATION	9- 12.1.3.a.	Explain that some algorithms do not lead to exact solutions in a reasonable amount of time and thus approximations are acceptable.
GRADE EXPECTATION	9- 12.1.3.c.	Distinguish when a problem solution requires decisions to be made among alternatives, such as selection constructs, or when a solution needs to be iteratively processed to arrive at a result, such as iterative "loop" constructs or recursion.
GRADE EXPECTATION	9- 12.1.3.d.	Evaluate and select algorithms based on performance, reusability, and ease of implementation.
GRADE EXPECTATION	9- 12.1.3.e.	Explain how more than one algorithm may solve the same problem and yet be characterized with different priorities.
STRAND / DOMAIN	AL.DLCS. 9-12.	Digital Literacy and Computer Science
OBJECTIVE / CATEGORY	9-12.1.	Computational Thinker
STANDARD		Algorithms
RELATED CONTENT / EXPECTATION	9-12.1.4.	Use and adapt classic algorithms to solve computational problems.

STRAND /	AL.DLCS.	Digital Literacy and Computer Science
DOMAIN	9-12.	

OBJECTIVE / CATEGORY	9-12.5.	Innovative Designer
STANDARD		Human/Computer Partnerships
RELATED CONTENT / EXPECTATION	9- 12.5.39.	Identify a problem that cannot be solved by either humans or machines alone and discuss a solution for it by decomposing the task into sub-problems suited for a human or machine to accomplish.

# Alabama Courses of Study Technology Education Grade 12 - Adopted: 2018

STRAND / DOMAIN	AL.DLCS. 9-12.	Digital Literacy and Computer Science
OBJECTIVE / CATEGORY	9-12.1.	Computational Thinker
STANDARD		Algorithms
RELATED CONTENT / EXPECTATION	9-12.1.3.	Differentiate between a generalized expression of an algorithm in pseudocode and its concrete implementation in a programming language.
GRADE EXPECTATION	9- 12.1.3.a.	Explain that some algorithms do not lead to exact solutions in a reasonable amount of time and thus approximations are acceptable.
GRADE EXPECTATION	9- 12.1.3.c.	Distinguish when a problem solution requires decisions to be made among alternatives, such as selection constructs, or when a solution needs to be iteratively processed to arrive at a result, such as iterative "loop" constructs or recursion.
GRADE EXPECTATION	9- 12.1.3.d.	Evaluate and select algorithms based on performance, reusability, and ease of implementation.
GRADE EXPECTATION	9- 12.1.3.e.	Explain how more than one algorithm may solve the same problem and yet be characterized with different priorities.

STRAND / DOMAIN	AL.DLCS. 9-12.	Digital Literacy and Computer Science
OBJECTIVE / CATEGORY	9-12.1.	Computational Thinker
STANDARD		Algorithms
RELATED CONTENT /	9-12.1.4.	Use and adapt classic algorithms to solve computational problems.

EXPECTATION

STRAND / DOMAIN	AL.DLCS. 9-12.	Digital Literacy and Computer Science
OBJECTIVE / CATEGORY	9-12.5.	Innovative Designer
STANDARD		Human/Computer Partnerships
RELATED CONTENT / EXPECTATION	9- 12.5.39.	Identify a problem that cannot be solved by either humans or machines alone and discuss a solution for it by decomposing the task into sub-problems suited for a human or machine to accomplish.