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

Forward Education

Autonomous Electric Vehicles of the Future

California Content Standards
Mathematics
Grade **11** - Adopted: **2013**

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

CONTENT STANDARD / DOMAIN / PART	CA.AI.	Algebra I
PERFORMANCE STANDARD / MODE	**A-CED.**	**Algebra: Creating Equations**
EXPECTATION / SUBSTRAND		**Create equations that describe numbers or relationships. [Linear, quadratic, and exponential (integer inputs only); for A.CED.3 linear only]**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	CA.AI.	Algebra I
PERFORMANCE STANDARD / MODE	**A-REI.**	**Algebra: Reasoning with Equations and Inequalities**
EXPECTATION / SUBSTRAND		**Understand solving equations as a process of reasoning and explain the reasoning. [Master linear; learn as general principle.]**

FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.AI.**	**Algebra I**
PERFORMANCE STANDARD / MODE	**F-IF.**	**Functions: Interpreting Functions**
EXPECTATION / SUBSTRAND		**Analyze functions using different representations. [Linear, exponential, quadratic, absolute value, step, piecewise-defined]**
FOUNDATION / PROFICIENCY LEVEL	**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.**
GRADE LEVEL EXPECTATION	F-IF.7.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima.

CONTENT STANDARD / DOMAIN / PART	**CA.AI.**	**Algebra I**
PERFORMANCE STANDARD / MODE	**F-LE.**	**Functions: Linear, Quadratic, and Exponential Models**
EXPECTATION / SUBSTRAND		**Construct and compare linear, quadratic, and exponential models and solve problems.**
FOUNDATION / PROFICIENCY LEVEL	**F-LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
GRADE LEVEL EXPECTATION	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 / DOMAIN / PART	**CA.G.**	**Geometry**
PERFORMANCE STANDARD / MODE	**G-GPE.**	**Geometry: Expressing Geometric Properties with Equations**
EXPECTATION / SUBSTRAND		**Use coordinates to prove simple geometric theorems algebraically. [Include distance formula; relate to Pythagorean Theorem.]**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.AII.**	**Algebra II**
PERFORMANCE STANDARD / MODE	**A-CED.**	**Algebra: Creating Equations**
EXPECTATION / SUBSTRAND		**Create equations that describe numbers or relationships. [Equations using all available types of expressions, including simple root functions]**

FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.MI.**	**Mathematics I**
PERFORMANCE STANDARD / MODE	**A-CED.**	**Algebra: Creating Equations**
EXPECTATION / SUBSTRAND		**Create equations that describe numbers or relationships. [Linear and exponential (integer inputs only); for A.CED.3, linear only]**

FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.MI.**	**Mathematics I**
PERFORMANCE STANDARD / MODE	**A-REI.**	**Algebra: Reasoning with Equations and Inequalities**
EXPECTATION / SUBSTRAND		**Understand solving equations as a process of reasoning and explain the reasoning. [Master linear; learn as general principle.]**

FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.MI.**	**Mathematics I**
PERFORMANCE STANDARD / MODE	**F-IF.**	**Functions: Interpreting Functions**
EXPECTATION / SUBSTRAND		**Analyze functions using different representations. [Linear and exponential]**
FOUNDATION / PROFICIENCY LEVEL	**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.**

GRADE LEVEL EXPECTATION	F-IF.7.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima.

CONTENT STANDARD / DOMAIN / PART	**CA.MI.**	**Mathematics I**
PERFORMANCE STANDARD / MODE	**F-LE.**	**Functions: Linear, Quadratic, and Exponential Models**
EXPECTATION / SUBSTRAND		**Construct and compare linear, quadratic, and exponential models and solve problems. [Linear and exponential]**
FOUNDATION / PROFICIENCY LEVEL	**F-LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**

GRADE LEVEL EXPECTATION	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 / DOMAIN / PART	**CA.MI.**	**Mathematics I**
PERFORMANCE STANDARD / MODE	**G-GPE.**	**Geometry: Expressing Geometric Properties with Equations**
EXPECTATION / SUBSTRAND		**Use coordinates to prove simple geometric theorems algebraically. [Include distance formula; relate to Pythagorean Theorem.]**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.MII.**	**Mathematics II**
PERFORMANCE STANDARD / MODE	**A-CED.**	**Algebra: Creating Equations**
EXPECTATION / SUBSTRAND		**Create equations that describe numbers or relationships.**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.MII.**	**Mathematics II**
PERFORMANCE STANDARD / MODE	**F-IF.**	**Functions: Interpreting Functions**
EXPECTATION / SUBSTRAND		**Analyze functions using different representations. [Linear, exponential, quadratic, absolute value, step, piecewise-defined]**
FOUNDATION / PROFICIENCY LEVEL	**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.**
GRADE LEVEL EXPECTATION	F-IF.7.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima.

CONTENT STANDARD / DOMAIN / PART	**CA.MIII.**	**Mathematics III**
PERFORMANCE STANDARD / MODE	**A-CED.**	**Algebra: Creating Equations**
EXPECTATION / SUBSTRAND		**Create equations that describe numbers or relationships. [Equations using all available types of expressions, including simple root functions]**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.PC.**	**Precalculus**
PERFORMANCE STANDARD / MODE	**A-CED.**	**Algebra: Creating Equations**
EXPECTATION / SUBSTRAND		**Create equations that describe numbers or relationships.**
FOUNDATION / PROFICIENCY LEVEL	A-CED.2.	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

California Content Standards

Mathematics

Grade **12** - Adopted: **2013**

CONTENT STANDARD / DOMAIN / PART	**CA.CC.MP.**	**Standards for Mathematical Practice**
PERFORMANCE STANDARD / MODE	MP.1.	Make sense of problems and persevere in solving them.
PERFORMANCE STANDARD / MODE	MP.2.	Reason abstractly and quantitatively.
PERFORMANCE STANDARD / MODE	MP.3.	Construct viable arguments and critique the reasoning of others.
PERFORMANCE STANDARD / MODE	MP.4.	Model with mathematics.
PERFORMANCE STANDARD / MODE	MP.8.	Look for and express regularity in repeated reasoning.

CONTENT STANDARD / DOMAIN / PART	**CA.AI.**	**Algebra I**
PERFORMANCE STANDARD / MODE	**A-CED.**	**Algebra: Creating Equations**
EXPECTATION / SUBSTRAND		**Create equations that describe numbers or relationships. [Linear, quadratic, and exponential (integer inputs only); for A.CED.3 linear only]**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.AI.**	**Algebra I**

PERFORMANCE STANDARD / MODE	**A-REI.**	**Algebra: Reasoning with Equations and Inequalities**
EXPECTATION / SUBSTRAND		**Understand solving equations as a process of reasoning and explain the reasoning. [Master linear; learn as general principle.]**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.AI.**	**Algebra I**
PERFORMANCE STANDARD / MODE	**F-IF.**	**Functions: Interpreting Functions**
EXPECTATION / SUBSTRAND		**Analyze functions using different representations. [Linear, exponential, quadratic, absolute value, step, piecewise-defined]**
FOUNDATION / PROFICIENCY LEVEL	**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.**
GRADE LEVEL EXPECTATION	F-IF.7.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima.

CONTENT STANDARD / DOMAIN / PART	**CA.AI.**	**Algebra I**
PERFORMANCE STANDARD / MODE	**F-LE.**	**Functions: Linear, Quadratic, and Exponential Models**
EXPECTATION / SUBSTRAND		**Construct and compare linear, quadratic, and exponential models and solve problems.**
FOUNDATION / PROFICIENCY LEVEL	**F-LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
GRADE LEVEL EXPECTATION	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 / DOMAIN / PART	**CA.G.**	**Geometry**
PERFORMANCE STANDARD / MODE	**G-GPE.**	**Geometry: Expressing Geometric Properties with Equations**
EXPECTATION / SUBSTRAND		**Use coordinates to prove simple geometric theorems algebraically. [Include distance formula; relate to Pythagorean Theorem.]**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.AII.**	**Algebra II**

PERFORMANCE STANDARD / MODE	**A-CED.**	**Algebra: Creating Equations**
EXPECTATION / SUBSTRAND		**Create equations that describe numbers or relationships. [Equations using all available types of expressions, including simple root functions]**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.MI.**	**Mathematics I**
PERFORMANCE STANDARD / MODE	**A-CED.**	**Algebra: Creating Equations**
EXPECTATION / SUBSTRAND		**Create equations that describe numbers or relationships. [Linear and exponential (integer inputs only); for A.CED.3, linear only]**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.MI.**	**Mathematics I**
PERFORMANCE STANDARD / MODE	**A-REI.**	**Algebra: Reasoning with Equations and Inequalities**
EXPECTATION / SUBSTRAND		**Understand solving equations as a process of reasoning and explain the reasoning. [Master linear; learn as general principle.]**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.MI.**	**Mathematics I**
PERFORMANCE STANDARD / MODE	**F-IF.**	**Functions: Interpreting Functions**
EXPECTATION / SUBSTRAND		**Analyze functions using different representations. [Linear and exponential]**
FOUNDATION / PROFICIENCY LEVEL	**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.**
GRADE LEVEL EXPECTATION	F-IF.7.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima.

CONTENT STANDARD / DOMAIN / PART	**CA.MI.**	**Mathematics I**
PERFORMANCE STANDARD / MODE	**F-LE.**	**Functions: Linear, Quadratic, and Exponential Models**
EXPECTATION / SUBSTRAND		**Construct and compare linear, quadratic, and exponential models and solve problems. [Linear and exponential]**

FOUNDATION / PROFICIENCY LEVEL	**F-LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
GRADE LEVEL EXPECTATION	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 / DOMAIN / PART	**CA.MI.**	**Mathematics I**
PERFORMANCE STANDARD / MODE	**G-GPE.**	**Geometry: Expressing Geometric Properties with Equations**
EXPECTATION / SUBSTRAND		**Use coordinates to prove simple geometric theorems algebraically. [Include distance formula; relate to Pythagorean Theorem.]**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.MII.**	**Mathematics II**
PERFORMANCE STANDARD / MODE	**A-CED.**	**Algebra: Creating Equations**
EXPECTATION / SUBSTRAND		**Create equations that describe numbers or relationships.**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.MII.**	**Mathematics II**
PERFORMANCE STANDARD / MODE	**F-IF.**	**Functions: Interpreting Functions**
EXPECTATION / SUBSTRAND		**Analyze functions using different representations. [Linear, exponential, quadratic, absolute value, step, piecewise-defined]**
FOUNDATION / PROFICIENCY LEVEL	**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.**
GRADE LEVEL EXPECTATION	F-IF.7.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima.

CONTENT STANDARD / DOMAIN / PART	**CA.MIII.**	**Mathematics III**
PERFORMANCE STANDARD / MODE	**A-CED.**	**Algebra: Creating Equations**
EXPECTATION / SUBSTRAND		**Create equations that describe numbers or relationships. [Equations using all available types of expressions, including simple root functions]**

FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.PC.**	**Precalculus**
PERFORMANCE STANDARD / MODE	**A-CED.**	**Algebra: Creating Equations**
EXPECTATION / SUBSTRAND		**Create equations that describe numbers or relationships.**

FOUNDATION / PROFICIENCY LEVEL	A-CED.2.	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

California Content Standards

Science

Grade **11** - Adopted: **2013**

CONTENT STANDARD / DOMAIN / PART	**CA.HS-PS.**	**PHYSICAL SCIENCE**
PERFORMANCE STANDARD / MODE	**HS-PS1.**	**Matter and Its Interactions**
EXPECTATION / SUBSTRAND		**Students who demonstrate understanding can:**

FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.HS-PS.**	**PHYSICAL SCIENCE**
PERFORMANCE STANDARD / MODE	**HS-PS3.**	**Energy**
EXPECTATION / SUBSTRAND		**Students who demonstrate understanding can:**

FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.HS-PS.**	**PHYSICAL SCIENCE**
PERFORMANCE STANDARD / MODE	**HS-PS4.**	**Waves and Their Applications in Technologies for Information Transfer**
EXPECTATION / SUBSTRAND		**Students who demonstrate understanding can:**

FOUNDATION / PROFICIENCY LEVEL	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.
CONTENT STANDARD / DOMAIN / PART	**CA.HS-LS.**	**LIFE SCIENCE**
PERFORMANCE STANDARD / MODE	**HS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
EXPECTATION / SUBSTRAND		**Students who demonstrate understanding can:**
FOUNDATION / PROFICIENCY LEVEL	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
CONTENT STANDARD / DOMAIN / PART	**CA.HS-ESS.**	**EARTH AND SPACE SCIENCE**
PERFORMANCE STANDARD / MODE	**HS-ESS2.**	**Earth's Systems**
EXPECTATION / SUBSTRAND		**Students who demonstrate understanding can:**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.HS-ESS.**	**EARTH AND SPACE SCIENCE**
PERFORMANCE STANDARD / MODE	**HS-ESS3.**	**Earth and Human Activity**
EXPECTATION / SUBSTRAND		**Students who demonstrate understanding can:**
FOUNDATION / PROFICIENCY LEVEL	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.
FOUNDATION / PROFICIENCY LEVEL	HS-ESS3-2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
FOUNDATION / PROFICIENCY LEVEL	HS-ESS3-3.	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
FOUNDATION / PROFICIENCY LEVEL	HS-ESS3-4.	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.HS-ETS.**	**ENGINEERING DESIGN**
PERFORMANCE STANDARD / MODE	**HS-ETS1.**	**Engineering Design**
EXPECTATION / SUBSTRAND		**Students who demonstrate understanding can:**
FOUNDATION / PROFICIENCY LEVEL	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.
FOUNDATION / PROFICIENCY LEVEL	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.
FOUNDATION / PROFICIENCY LEVEL	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.
CONTENT STANDARD / DOMAIN / PART	**CA.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
PERFORMANCE STANDARD / MODE		**Key Ideas and Details**
EXPECTATION / SUBSTRAND	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.
EXPECTATION / SUBSTRAND	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.
CONTENT STANDARD / DOMAIN / PART	**CA.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
PERFORMANCE STANDARD / MODE		**Craft and Structure**
EXPECTATION / SUBSTRAND	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.
EXPECTATION / SUBSTRAND	RST.11-12.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
CONTENT STANDARD / DOMAIN / PART	**CA.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
PERFORMANCE STANDARD / MODE		**Integration of Knowledge and Ideas**

EXPECTATION / SUBSTRAND	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.

CONTENT STANDARD / DOMAIN / PART	**CA.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
PERFORMANCE STANDARD / MODE		**Range of Reading and Level of Text Complexity**

EXPECTATION / SUBSTRAND	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.

CONTENT STANDARD / DOMAIN / PART	**CA.WHST.11-12.**	**Writing Standards for Literacy in Science and Technical Subjects**
PERFORMANCE STANDARD / MODE		**Text Types and Purposes**
EXPECTATION / SUBSTRAND	**WHST.11-12.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**

FOUNDATION / PROFICIENCY LEVEL	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.

CONTENT STANDARD / DOMAIN / PART	**CA.WHST.11-12.**	**Writing Standards for Literacy in Science and Technical Subjects**
PERFORMANCE STANDARD / MODE		**Production and Distribution of Writing**

EXPECTATION / SUBSTRAND	WHST.11-12.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

EXPECTATION / SUBSTRAND	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.

California Content Standards

Science

Grade **12** - Adopted: **2013**

CONTENT STANDARD / DOMAIN / PART	**CA.HS-PS.**	**PHYSICAL SCIENCE**
PERFORMANCE STANDARD / MODE	**HS-PS1.**	**Matter and Its Interactions**
EXPECTATION / SUBSTRAND		**Students who demonstrate understanding can:**

FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.HS-PS.**	**PHYSICAL SCIENCE**
PERFORMANCE STANDARD / MODE	**HS-PS3.**	**Energy**
EXPECTATION / SUBSTRAND		**Students who demonstrate understanding can:**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.HS-PS.**	**PHYSICAL SCIENCE**
PERFORMANCE STANDARD / MODE	**HS-PS4.**	**Waves and Their Applications in Technologies for Information Transfer**
EXPECTATION / SUBSTRAND		**Students who demonstrate understanding can:**
FOUNDATION / PROFICIENCY LEVEL	HS-PS4-2.	Evaluate questions about the advantages of using a digital transmission and storage of information.

CONTENT STANDARD / DOMAIN / PART	**CA.HS-LS.**	**LIFE SCIENCE**
PERFORMANCE STANDARD / MODE	**HS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
EXPECTATION / SUBSTRAND		**Students who demonstrate understanding can:**
FOUNDATION / PROFICIENCY LEVEL	HS-LS2-7.	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

CONTENT STANDARD / DOMAIN / PART	**CA.HS-ESS.**	**EARTH AND SPACE SCIENCE**
PERFORMANCE STANDARD / MODE	**HS-ESS2.**	**Earth's Systems**
EXPECTATION / SUBSTRAND		**Students who demonstrate understanding can:**
FOUNDATION / PROFICIENCY LEVEL	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 / DOMAIN / PART	**CA.HS-ESS.**	**EARTH AND SPACE SCIENCE**
PERFORMANCE STANDARD / MODE	**HS-ESS3.**	**Earth and Human Activity**

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

CONTENT STANDARD / DOMAIN / PART	CA.RST.11-12.	Reading Standards for Literacy in Science and Technical Subjects
PERFORMANCE STANDARD / MODE		Key Ideas and Details
EXPECTATION / SUBSTRAND	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.
EXPECTATION / SUBSTRAND	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.

CONTENT STANDARD / DOMAIN / PART	**CA.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
PERFORMANCE STANDARD / MODE		**Craft and Structure**
EXPECTATION / SUBSTRAND	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.
EXPECTATION / SUBSTRAND	RST.11-12.5.	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

CONTENT STANDARD / DOMAIN / PART	**CA.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
PERFORMANCE STANDARD / MODE		**Integration of Knowledge and Ideas**
EXPECTATION / SUBSTRAND	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.

CONTENT STANDARD / DOMAIN / PART	**CA.RST.11-12.**	**Reading Standards for Literacy in Science and Technical Subjects**
PERFORMANCE STANDARD / MODE		**Range of Reading and Level of Text Complexity**
EXPECTATION / SUBSTRAND	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.

CONTENT STANDARD / DOMAIN / PART	**CA.WHST.11-12.**	**Writing Standards for Literacy in Science and Technical Subjects**
PERFORMANCE STANDARD / MODE		**Text Types and Purposes**
EXPECTATION / SUBSTRAND	**WHST.11-12.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
FOUNDATION / PROFICIENCY LEVEL	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.

CONTENT STANDARD / DOMAIN / PART	**CA.WHST.11-12.**	**Writing Standards for Literacy in Science and Technical Subjects**
PERFORMANCE STANDARD / MODE		**Production and Distribution of Writing**
EXPECTATION / SUBSTRAND	WHST.11-12.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
EXPECTATION / SUBSTRAND	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.

California Content Standards

Technology Education

Grade **11** - Adopted: **2018**

CONTENT STANDARD / DOMAIN / PART		**Computer Science Core Practices**
PERFORMANCE STANDARD / MODE	**P3.**	**Core Practice 3 – Recognizing and Defining Computational Problems**
EXPECTATION / SUBSTRAND	P3.1.	Identify complex, interdisciplinary, real-world problems that can be solved computationally.

CONTENT STANDARD / DOMAIN / PART		**Computer Science Standards – Core**
PERFORMANCE STANDARD / MODE		**Algorithms & Programming**
EXPECTATION / SUBSTRAND		**Algorithms**
FOUNDATION / PROFICIENCY LEVEL	9-12.AP.12.	Design algorithms to solve computational problems using a combination of original and existing algorithms. (P4.2, P5.1)

CONTENT STANDARD / DOMAIN / PART		**Computer Science Standards – Specialty**
PERFORMANCE STANDARD / MODE		**Algorithms & Programming**
EXPECTATION / SUBSTRAND		**Modularity**
FOUNDATION / PROFICIENCY LEVEL	9-12S.AP.17.	Construct solutions to problems using student-created components, such as procedures, modules, and/or objects. (P4.3, P5.2)

California Content Standards

Technology Education

Grade **12** - Adopted: **2018**

CONTENT STANDARD / DOMAIN / PART		**Computer Science Core Practices**
PERFORMANCE STANDARD / MODE	**P3.**	**Core Practice 3 – Recognizing and Defining Computational Problems**
EXPECTATION / SUBSTRAND	P3.1.	Identify complex, interdisciplinary, real-world problems that can be solved computationally.

CONTENT STANDARD / DOMAIN / PART		**Computer Science Standards – Core**
PERFORMANCE STANDARD / MODE		**Algorithms & Programming**

EXPECTATION / SUBSTRAND		**Algorithms**
FOUNDATION / PROFICIENCY LEVEL	9-12.AP.12.	Design algorithms to solve computational problems using a combination of original and existing algorithms. (P4.2, P5.1)

CONTENT STANDARD / DOMAIN / PART		**Computer Science Standards – Specialty**
PERFORMANCE STANDARD / MODE		**Algorithms & Programming**
EXPECTATION / SUBSTRAND		**Modularity**
FOUNDATION / PROFICIENCY LEVEL	9-12S.AP.17.	Construct solutions to problems using student-created components, such as procedures, modules, and/or objects. (P4.3, P5.2)