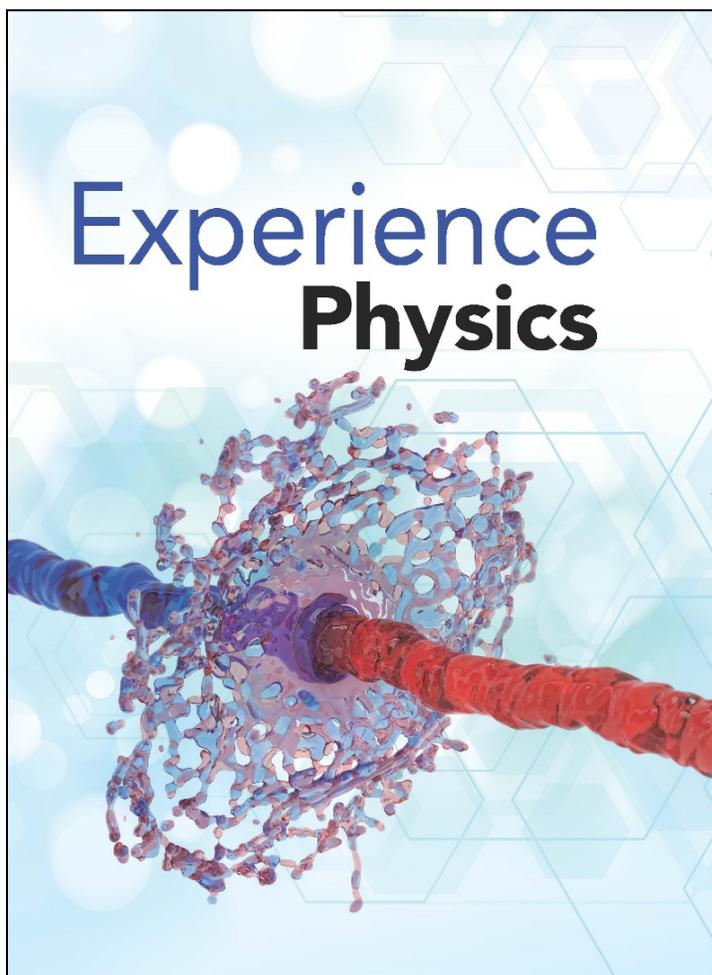


An Alignment of

**California  
Common Core State Standards  
for Mathematics  
Grades 6-8 and High School**

To



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# An Alignment of the California Common Core State Standards for Mathematics Grades 6-8 and High School to Experience Physics, ©2022

## Introduction

This document identifies the Math Prerequisite Grades 6-8 California Common Core State Standards and the extended High School California Common Core State Standards aligned to ***Experience Physics*** ©2022.

Savvas Learning Company is excited to introduce ***Experience Physics***!

Students best learn science when they *do* science! Therefore ***Experience Physics*** puts the focus on the student experience. This modern program implements a learning model that organizes learning around phenomena giving students an authentic, real-world experience. ***Experience Physics*** includes a variety of hands-on and digital activities designed to reach every learner, and partners with Flinn Scientific to deliver high-quality inquiry labs, engineering workbenches, and performance assessments.

**Phenomenal Experiences** Begin with a relevant and engaging phenomenon. Learning is organized around learning around phenomena, giving students an authentic, real-world experience. ***Experience Physics*** includes a variety of hands-on and digital activities designed to reach every learner, encouraging students to ask and answer questions, gather evidence, and organize their reasoning as they experience the concepts of physics firsthand.

**Flinn Scientific Partnership** Labs, Engineering Workbenches, dataset activities, and performance tasks enhance the student experience and encourage your class to do more science! Hands-on inquiry labs are available in open-ended, guided, shortened, and advanced versions, perfect for meeting the needs of every student.

**Personalize Instruction** The Teacher Guide allows instructors to personalize their course by selecting from our activities or embedding their own. Enhance instructional plan with Got More Time? Activities, or substitute with Related Phenomena when you want to make a change! Additionally, storyline and Investigation Planners use the 5E model to streamline your prep time.

**Build Mathematical Fluency** Stepped-out examples in the Experience Handbook break down sample problems for clarity and process guidance, while math tutorial videos reinforce mathematical processes. The Physics and Math Skills Workbook includes four pages of review and practice problems for every learning experience. These activities and more guide students as they become more proficient with math and physics concepts.

**Savvas Realize™ Award-Winning Digital Platform** Access all your digital content, virtual labs, simulations, assessments, and student data in ONE location. Savvas Realize has offline accessibility, so students can study from anywhere.

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**An Alignment of the California Common Core State Standards for Mathematics  
Middle Grades and High School to Experience Physics, ©2022**

Experience Physics Curriculum Contents	Prerequisite Middle Grades California Common Core State Standards	Extended High School California Common Core State Standards
<b>Storyline 1 – Forces in Motion</b>		
<b>Investigation 1: Describing Position and Motion (or Modeling Motion)</b>		
Experience 1- Displacement and Velocity	<p><b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5a.</b> Reporting the number of observations.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.VM. 1. (+)</b> Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes.</p> <p><b>N.VM. 2. (+)</b> Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.</p> <p><b>N.VM. 3. (+)</b> Solve problems involving velocity and other quantities that can be represented by vectors.</p> <p><b>N.VM.4. a.</b> Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.</p> <p><b>N.VM.4 b.</b> Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.</p> <p><b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>A.REI. 3.</b> Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p> <p><b>A.REI. 4.</b> Solve quadratic equations in one variable.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><b>S.ID. 7.</b> Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.</p> <p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
(Continued) Experience 1- Displacement and Velocity	<b>7.EE.3.</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.	<b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling. <b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. <b>F.IF. 6.</b> Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
Experience 2- Acceleration	<b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values, use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. <b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots. <b>6.SP. 5a.</b> Reporting the number of observations. <b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. <b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. <b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. <b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers. <b>7.EE.3.</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.	<b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. <b>A.REI. 3.</b> Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. <b>A.REI. 4.</b> Solve quadratic equations in one variable. <b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). <b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots). <b>S.ID. 7.</b> Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. <b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. <b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling. <b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. <b>F.IF. 6.</b> Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
<p>Experience 3- Circular and Projectile Motion</p>	<p><b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5a.</b> Reporting the number of observations.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>7.EE.3.</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p> <p><b>8.G. 8.</b> Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</p>	<p><b>N.VM. 1. (+)</b> Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes.</p> <p><b>N.VM. 2. (+)</b> Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.</p> <p><b>N.VM. 3. (+)</b> Solve problems involving velocity and other quantities that can be represented by vectors.</p> <p><b>N.VM.4. a.</b> Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.</p> <p><b>N.VM.4 b.</b> Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.</p> <p><b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>A.REI. 3.</b> Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p> <p><b>A.REI. 4.</b> Solve quadratic equations in one variable.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p> <p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
(Continued) Experience 3- Circular and Projectile Motion		<p><b>F.IF. 6.</b> Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p>
<b>Investigation 2: Forces</b>		
Experience 1- Force, Mass, and Acceleration	<p><b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5a.</b> Reporting the number of observations.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>N.VM. 1. (+)</b> Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes.</p> <p><b>N.VM. 2. (+)</b> Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.</p> <p><b>N.VM. 3. (+)</b> Solve problems involving velocity and other quantities that can be represented by vectors.</p> <p><b>N.VM.4. a.</b> Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.</p> <p><b>N.VM.4 b.</b> Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.</p> <p><b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
(Continued) Experience 1- Force, Mass, and Acceleration	<b>7.EE. 3.</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.	<b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots). <b>S.ID.6. a.</b> Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.
Experience 2- Types of Forces	<b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. <b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots. <b>6.SP. 5a.</b> Reporting the number of observations. <b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. <b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). <b>7.EE. 3.</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. <b>8.G. 8.</b> Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	<b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. <b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling. <b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. <b>N.VM. 1. (+)</b> Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes. <b>N.VM. 2. (+)</b> Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point. <b>N.VM. 3. (+)</b> Solve problems involving velocity and other quantities that can be represented by vectors. <b>N.VM.4. a.</b> Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes. <b>N.VM.4 b.</b> Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum. <b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. <b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
(Continued) Experience 2- Types of Forces		<p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><b>S.ID.6. a.</b> Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.</p>
Experience 3- Forces on Systems	<p><b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>7.EE. 3.</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
Experience 4- Earth Processes and Forces	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5a.</b> Reporting the number of observations.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p>

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Experience Physics Curriculum Contents	Prerequisite Middle Grades California Common Core State Standards	Extended High School California Common Core State Standards
<b>Storyline 2 – Forces at a Distance</b>		
<b>Investigation 3: Gravitational Forces</b>		
Experience 1- Universal Gravitation	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5a.</b> Reporting the number of observations.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2. a.</b> Decide whether two quantities are in a proportional relationship.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><b>S.ID.6. a.</b> Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.</p> <p><b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p> <p><b>N.VM. 1. (+)</b> Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes.</p> <p><b>N.VM. 2. (+)</b> Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.</p> <p><b>N.VM. 3. (+)</b> Solve problems involving velocity and other quantities that can be represented by vectors.</p> <p><b>F-LE. 6.</b> Apply quadratic functions to physical problems, such as the motion of an object under the force of gravity. CA</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
Experience 2- Orbital Motion	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5a.</b> Reporting the number of observations.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><b>S.ID.6. a.</b> Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.</p> <p><b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p> <p><b>N.VM. 3. (+)</b> Solve problems involving velocity and other quantities that can be represented by vectors.</p> <p><b>F-LE. 6.</b> Apply quadratic functions to physical problems, such as the motion of an object under the force of gravity. CA</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
<p>Experience 3- Kepler's Laws</p>	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5a.</b> Reporting the number of observations.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p> <p><b>F-LE. 4.3</b> Understand and use the properties of logarithms to simplify logarithmic numeric expressions and to identify their approximate values. CA</p> <p><b>F-LE. 6.</b> Apply quadratic functions to physical problems, such as the motion of an object under the force of gravity. CA</p>

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Experience Physics Curriculum Contents	Prerequisite Middle Grades California Common Core State Standards	Extended High School California Common Core State Standards
<b>Investigation 4: Electric Forces</b>		
Experience 1- Coulomb's Law	<p><b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5a.</b> Reporting the number of observations.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2. a.</b> Decide whether two quantities are in a proportional relationship.</p> <p><b>7.EE.3.</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
Experience 2- Electric Fields	<p><b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2. a.</b> Decide whether two quantities are in a proportional relationship.</p> <p><b>7.EE.3.</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>N.VM. 3. (+)</b> Solve problems involving velocity and other quantities that can be represented by vectors.</p>
Experience 3- Electric Current	<p><b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2. a.</b> Decide whether two quantities are in a proportional relationship.</p> <p><b>7.EE.3.</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>

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Experience Physics Curriculum Contents	Prerequisite Middle Grades California Common Core State Standards	Extended High School California Common Core State Standards
<b>Investigation 5: Magnetic Forces</b>		
Experience 1- Magnetism	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5a.</b> Reporting the number of observations.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>
Experience 2- Magnetic Fields	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5a.</b> Reporting the number of observations.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.RP.3 d.</b> Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>N.VM. 2. (+)</b> Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.</p> <p><b>N.VM. 3. (+)</b> Solve problems involving velocity and other quantities that can be represented by vectors.</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
Experience 3- Inducing Current	<p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2.a.</b> Decide whether two quantities are in a proportional relationship.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><b>A-CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>N.VM. 2. (+)</b> Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.</p> <p><b>N.VM. 3. (+)</b> Solve problems involving velocity and other quantities that can be represented by vectors.</p>
<b>Investigation 6: Forces in Materials</b>		
Experience 1- Atoms and Atomic Structure	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
Experience 2- Attractive and Repulsive Forces	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5a.</b> Reporting the number of observations.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p>
Experience 3- Material Properties	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2.a.</b> Decide whether two quantities are in a proportional relationship.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
Experience 4- Structure and Function	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p>

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Experience Physics Curriculum Contents	Prerequisite Middle Grades California Common Core State Standards	Extended High School California Common Core State Standards
<b>Storyline 3 – Energy Conversion</b>		
<b>Investigation 7: Energy</b>		
Experience 1- Classifying Energy and Work	<p><b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2.a.</b> Decide whether two quantities are in a proportional relationship.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
Experience 2- Kinetic and Potential Energy	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p>
Experience 3- Conservation of Energy	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2.a.</b> Decide whether two quantities are in a proportional relationship.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p>

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Experience Physics Curriculum Contents	Prerequisite Middle Grades California Common Core State Standards	Extended High School California Common Core State Standards
<b>Investigation 8: Collisions</b>		
Experience 1- Momentum and Impulse	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2.a.</b> Decide whether two quantities are in a proportional relationship.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>F.LE. 6.</b> Apply quadratic functions to physical problems, such as the motion of an object under the force of gravity. CA</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
<p>Experience 2- Conservation of Momentum</p>	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2.a.</b> Decide whether two quantities are in a proportional relationship.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>N.VM. 3. (+)</b> Solve problems involving velocity and other quantities that can be represented by vectors.</p> <p><b>N.VM.4. a.</b> Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.</p> <p><b>N.VM.4 b.</b> Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.</p> <p><b>F.LE. 6.</b> Apply quadratic functions to physical problems, such as the motion of an object under the force of gravity. CA</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
<p>Experience 3- Collisions in Earth's Crust</p>	<p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>

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Experience Physics Curriculum Contents	Prerequisite Middle Grades California Common Core State Standards	Extended High School California Common Core State Standards
<b>Investigation 9: Thermal Energy</b>		
Experience 1- Temperature	<p><b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2.a.</b> Decide whether two quantities are in a proportional relationship.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
<p>Experience 2- Thermal Equilibrium and Heat Flow</p>	<p><b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
Experience 3- Heat Flow Within Earth	<p><b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2.a.</b> Decide whether two quantities are in a proportional relationship.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>S.ID. 1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p>

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Experience Physics Curriculum Contents	Prerequisite Middle Grades California Common Core State Standards	Extended High School California Common Core State Standards
<b>Investigation 10: Electromagnetic Energy</b>		
Experience 1- Electric Potential	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
<p>Experience 2- Energy in Electric Circuits</p>	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
Experience 3- Power Generation	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
<p>Experience 4- Energy Resources and Conservation</p>	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>7.EE. 3.</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p> <p><b>8.SP. 1.</b> Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>S.ID. 6.</b> Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.</p>

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Experience Physics Curriculum Contents	Prerequisite Middle Grades California Common Core State Standards	Extended High School California Common Core State Standards
<b>Storyline 4 – Waves and Electromagnetic Radiation</b>		
<b>Investigation 11: Waves</b>		
Experience 1- Properties of Waves	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p> <p><b>A.CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>
Experience 2- Wave Behavior and Energy	<p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
Experience 3- Wave Optics	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 5.</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p> <p><b>A.CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>F.IF. 2.</b> Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.</p> <p><b>F.IF. 4.</b> For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</p>

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Experience Physics Curriculum Contents	Prerequisite Middle Grades California Common Core State Standards	Extended High School California Common Core State Standards
<b>Investigation 12: Electromagnetic Radiation</b>		
Experience 1- Electromagnetic Waves and Their Properties	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>
Experience 2- Particle-Wave Duality	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>

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Experience 3- EM Radiation and Matter	<b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.	<b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling. <b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
<b>Investigation 13: Information and Instrumentation</b>		
Experience 1- Digital Information	<b>6.NS. 3.</b> Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. <b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	<b>F.IF. 3.</b> Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. <b>F.IF.7. e.</b> Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. <b>F.IF.8. b.</b> Use the properties of exponents to interpret expressions for exponential functions. <b>F.BF.2.</b> Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. <b>F.LE. 2.</b> Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
Experience 2- Transmitting and Capturing Information	<b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	<b>F.IF. 3.</b> Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.

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<p>Experience 3- Transmitting and Capturing Energy</p>	<p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p>

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Experience Physics Curriculum Contents	Prerequisite Middle Grades California Common Core State Standards	Extended High School California Common Core State Standards
<b>Storyline 5 – From the Nucleus to the Universe</b>		
<b>Investigation 14: Nuclear Physics</b>		
Experience 1- Nuclear Forces	<p><b>6.RP. 1.</b> Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>7.RP. 2.</b> Recognize and represent proportional relationships between quantities.</p> <p><b>7.RP. 2.a.</b> Decide whether two quantities are in a proportional relationship.</p> <p><b>8.EE. 1.</b> Know and apply the properties of integer exponents to generate equivalent numerical expressions.</p> <p><b>8.EE. 3.</b> Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.</p> <p><b>8.EE. 4.</b> Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>F.IF.8. b.</b> Use the properties of exponents to interpret expressions for exponential functions.</p>

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Experience 2- Nuclear Particles	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>8.EE. 5.</b> Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
<p>Experience 3- Fission and Fusion</p>	<p><b>6.NS.5.</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>6.EE. 9.</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.CED. 2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A.CED. 4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p>

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Experience Physics Curriculum Contents	Prerequisite Middle Grades California Common Core State Standards	Extended High School California Common Core State Standards
<b>Investigation 15: Ages of Rocks</b>		
Experience 1- Radioactive Decay	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p> <p><b>F.IF.8. b.</b> Use the properties of exponents to interpret expressions for exponential functions.</p> <p><b>F.LE.1 c.</b> Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.</p>
Experience 2- Radiometric Dating	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>8.EE. 5.</b> Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>A.REI. 10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p>

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<b>Experience Physics Curriculum Contents</b>	<b>Prerequisite Middle Grades California Common Core State Standards</b>	<b>Extended High School California Common Core State Standards</b>
Experience 3- Exploring Patterns in the Ages of Rocks	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>F.LE. 4.</b> For exponential models, express as a logarithm the solution to <math>ab^{ct} = d</math> where <math>a</math>, <math>c</math>, and <math>d</math> are numbers and the base <math>b</math> is 2, 10, or <math>e</math>; evaluate the logarithm using technology.</p> <p><b>F.LE. 4.2</b> Use the definition of logarithms to translate between logarithms in any base. CA</p> <p><b>F.LE. 4.3</b> Understand and use the properties of logarithms to simplify logarithmic numeric expressions and to identify their approximate values. CA</p>
<b>Investigation 16: The Universe</b>		
Experience 1- Stars	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>8.EE. 5.</b> Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p>

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Experience 2- The Sun	<p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p><b>F.LE. 4.</b> For exponential models, express as a logarithm the solution to <math>ab^{ct} = d</math> where <math>a</math>, <math>c</math>, and <math>d</math> are numbers and the base <math>b</math> is 2, 10, or <math>e</math>; evaluate the logarithm using technology.</p> <p><b>F.LE. 4.2</b> Use the definition of logarithms to translate between logarithms in any base. CA</p> <p><b>F.LE. 4.3</b> Understand and use the properties of logarithms to simplify logarithmic numeric expressions and to identify their approximate values. CA</p>
Experience 3- The Big Bang	<p><b>6.RP. 1.</b> Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.</p> <p><b>6.SP. 4.</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p><b>6.SP. 5b.</b> Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p><b>6.EE.2c.</b> Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><b>7.NS. 3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p><b>N.Q. 1.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><b>N.Q. 2.</b> Define appropriate quantities for the purpose of descriptive modeling.</p> <p><b>N.Q. 3.</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p>

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