



INSPIRE CALIFORNIA SCIENCE

HIGH SCHOOL – PHYSICS
CURRICULUM PACING GUIDE

Getting Started

- Students will need the McGraw- Hill Physics Textbook, a copy of the Science Notebook (available to complete online in each lesson, fillable pdf or printable pdf), a Science Journal (which is a composition or notebook to keep notes in) and a student login for online materials such as Labs and Assessments. Website <https://my.mheducation.com/login> Username: Student first name and ID number (i.e. Stella95834) Password: Sutterpeak1
- Module Assessments can be printed or assigned to take online. Please discuss with your teacher if you would like the assessments assigned to take online or emailed to you as a pdf to print.
- Students have the option of completing the course by using “Learnsmart/Smartbook” (your teacher can assign it to you per module) where you have access to all of the textbook material online and/or can answer all questions online (from the Science Notebook) as well as assessments, with immediate feedback.
- The textbook or pacing guide will indicate when you should access online materials (videos, CER charts, additional activities). You can access them by logging in, click on Lessons, click on “Launch the Presentation” and find the resource you need by clicking “Next Resource” at the bottom or click the three lines in the top left-hand corner of your course, select the module and lesson and then scroll down to the appropriate section (Engage, Explore and Explain, Elaborate or Evaluate) which you can find at the bottom of the page in your textbook.
- You have two options to complete the lab requirement for this class:
 - **Option 1:** Complete labs in this course. There are several labs available in each module. You will need to **complete a minimum of 1 lab per module** and turn in the lab sheets to your teacher. A material list for all the labs can be obtained from your teacher. Your teacher will need to assign the labs to your student online account and it is suggested to look through the available labs for each module (online) ahead of time, choose which lab(s) you would like to complete, and obtain the materials you need. You can be reimbursed from your student budget for materials and borrow from the Lending Library when materials are available (i.e. microscope, etc.).
 - **Option 2:** Take a corresponding lab class through a community partner for the year. Please talk to your teacher and/or the school counselor for available options.

Module One: A Physics Toolkit			
6 Days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: A Physics Toolkit	<input type="checkbox"/> Textbook: Pages 3 <input type="checkbox"/> Science Notebook: Page 1	<input type="checkbox"/> Lab: Mass and Falling Objects	Students will explore the nature of science and the practices scientists use. Students will explore some of the key mathematical concepts needed in physics, including SI units, dimension analysis, significant figures, and problem-solving strategies. Students will explore uncertainty, precision, and accuracy in measurement. Students will explore how graphs are constructed and the types of relationships they reveal.
Day 2 Lesson One: Methods of Science	<input type="checkbox"/> Textbook: Pages 4-9 <input type="checkbox"/> Science Notebook: Pages 2-6	<input type="checkbox"/> Lab: Measuring Change	
Day 3 Lesson Two: Mathematics and Physics	<input type="checkbox"/> Textbook: Pages 10-13 <input type="checkbox"/> Science Notebook: Page 7-10	<input type="checkbox"/> PhysicsLAB: Mass and Volume <input type="checkbox"/> Lab: How far around?	
Day 4 Lesson Three: Measurement	<input type="checkbox"/> Textbook: Pages 14-17 <input type="checkbox"/> Science Notebook: Page 11-14	<input type="checkbox"/> PhysicsLAB: Exploring Objects in Motion	
Day 5 Lesson Four: Graphing Data	<input type="checkbox"/> Textbook: Pages 18-25 <input type="checkbox"/> Science Notebook: Pages 15-18 <input type="checkbox"/> Online: PhET Simulation: Graphing Lines		
Day 6 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 26-27 <input type="checkbox"/> Module Assessment		
Unit 1: Mechanics in One Dimension			
Module Two: Representing Motion			
8 days			
Days	Assignments	Labs	Focus
Day 1 Unit Opener	<input type="checkbox"/> Textbook: Page 29 <input type="checkbox"/> Online: Project Planner: STEM Unit Project: Build a Rocket	<input type="checkbox"/> Lab: Toy Car Race <input type="checkbox"/> PhysicsLAB: Motion Diagrams	Students will explore how motion diagrams and particle models can be used to represent motion. Students will explore how coordinate systems, vectors, and
Day 2 Module Opener: Representing Motion	<input type="checkbox"/> Textbook: Pages 31 <input type="checkbox"/> Science Notebook: Page 19	<input type="checkbox"/> Lab: Vector Models	

Day 3 Lesson One: Picturing Motion	<input type="checkbox"/> Textbook: Pages 32-34 <input type="checkbox"/> Science Notebook: Pages 20-23	<input type="checkbox"/> Lab: Velocity Vectors	scalars are used to describe motion.
Day 4 Lesson Two: Where and When?	<input type="checkbox"/> Textbook: Pages 35-39 <input type="checkbox"/> Science Notebook: Pages 24-27	<input type="checkbox"/> PhysicsLAB: Constant Speed	Students will explore how position-time graphs can be created and interpreted.
Day 5 Lesson Three: Position- Time Graphs	<input type="checkbox"/> Textbook: Pages 40-44 <input type="checkbox"/> Science Notebook: Pages 28-31		Students will explore the differences between speed and velocity and how motion can be modeled using equations.
Day 6-7 Lesson Four: How Fast?	<input type="checkbox"/> Textbook: Pages 45-52 <input type="checkbox"/> Science Notebook: Pages 32-36		
Day 8 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 53-54 <input type="checkbox"/> Module Assessment		
Module Three: Accelerated Motion 7 Days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Accelerated Motion	<input type="checkbox"/> Textbook: Page 56 <input type="checkbox"/> Science Notebook: Page 37	<input type="checkbox"/> Lab: Graphing Motion	Students will explore nonuniform motion diagrams velocity-time graphs, average and instantaneous acceleration, and how to calculate acceleration.
Day 2-3 Lesson One: Acceleration	<input type="checkbox"/> Textbook: Pages 57-65 <input type="checkbox"/> Science Notebook: Pages 38-43	<input type="checkbox"/> Lab: Steel Ball Race <input type="checkbox"/> Lab: Free Fall	Students will explore how equations can be used to describe the position and velocity of an object with a constant acceleration.
Day 4-5 Lesson Two: Motion with Constant Acceleration	<input type="checkbox"/> Textbook: Pages 66-73 <input type="checkbox"/> Science Notebook: Pages 44-49	<input type="checkbox"/> PhysicsLAB: Free-Fall Acceleration	Students will explore how objects accelerate in free-fall.
Day 6 Lesson Three: Free Fall	<input type="checkbox"/> Textbook: Pages 74-80 <input type="checkbox"/> Science Notebook: Pages 50-54		
Day 7 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 81-82 <input type="checkbox"/> Module Assessment		

Module Four: Forces in One Dimension			
7 Days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Forces in One Dimension	<input type="checkbox"/> Textbook: Page 84 <input type="checkbox"/> Science Notebook: Page 55	<input type="checkbox"/> Lab: Forces in Opposite Directions <input type="checkbox"/> Lab: Mass and Weight; Upside-Down Parachute	<p>Students will explore how forces cause changes in motion (including Newton's 1st and 2nd laws of motion) and practice representing forces with free-body diagrams.</p> <p>Students will explore weight, apparent weight, and drag forces.</p> <p>Students will explore Newton's third law and apply it, along with Newton's second law, to situations involving tension and normal forces.</p>
Day 2-3 Lesson One: Force and Motion	<input type="checkbox"/> Textbook: Pages 85-94 <input type="checkbox"/> Science Notebook: Pages 56-62 <input type="checkbox"/> Online: PhET Simulation: Forces and Motion	<input type="checkbox"/> PhysicsLAB: Newton's Third Law	
Day 4 Lesson Two: Weight and Drag Force	<input type="checkbox"/> Textbook: Pages 95-100 <input type="checkbox"/> Science Notebook: Pages 63-67		
Day 5 Lesson Three: Newton's Third Law	<input type="checkbox"/> Textbook: Pages 101-107 <input type="checkbox"/> Science Notebook: Pages 68-72		
Day 6 Module Wrap-Up STEM Unit Project	<input type="checkbox"/> Textbook: Pages 108-109 <input type="checkbox"/> Module Assessment <input type="checkbox"/> Complete and present STEM unit project: Build a Rocket		
Unit 2: Mechanics in Two Dimensions			
Module Five: Displacement and Force in Two Dimensions			
7 days			
Days	Assignments	Labs	Focus
Day 1 Unit Opener	<input type="checkbox"/> Textbook: Pages 111 <input type="checkbox"/> Online: Project Planner: STEM Unit Project: In Orbit		Students will explore how to graphically and algebraically add vectors in two dimensions and how to resolve vectors into their components.

Day 2 Module Opener: Displacement and Force in Two Dimensions	<input type="checkbox"/> Textbook: Pages 113 <input type="checkbox"/> Science Notebook: Page 73	<input type="checkbox"/> Lab: Adding Vectors <input type="checkbox"/> PhysicsLAB: Coefficient of Friction	Students will explore kinetic friction, static friction, and coefficients of friction.
Day 3-4 Lesson One: Vectors	<input type="checkbox"/> Textbook: Pages 114-121 <input type="checkbox"/> Science Notebook: Pages 74-79 <input type="checkbox"/> Online: PhET Simulation: Vector Addition	<input type="checkbox"/> Forensics Lab: Hit-and-Run Driver <input type="checkbox"/> Lab: Equilibrium; Forces on a Plane	Students will explore motion on inclined planes and equilibrium in two dimensions.
Day 5 Lesson Two: Friction	<input type="checkbox"/> Textbook: Pages 122-127 <input type="checkbox"/> Science Notebook: Pages 80-84 <input type="checkbox"/> Online: PhET Simulation: Friction	<input type="checkbox"/> PhysicsLAB: Perpendicular Forces; Sliding Down a Slope	
Day 6 Lesson Three: Forces in Two Dimensions	<input type="checkbox"/> Textbook: Pages 128-134 <input type="checkbox"/> Science Notebook: Pages 85-90		
Day 7 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 135-136 <input type="checkbox"/> Module Assessment		
Module Six: Motion in Two Dimensions 6 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Motion in Two Dimensions	<input type="checkbox"/> Textbook: Pages 138 <input type="checkbox"/> Science Notebook: Page 91	<input type="checkbox"/> Lab: Projectile Motion <input type="checkbox"/> Lab: Over the Edge; Projectile Path	Students will explore how the path of a project is determined by its launch conditions, gravity, and air resistance.
Day 2-3 Lesson One: Projectile Motion	<input type="checkbox"/> Textbook: Pages 139-146 <input type="checkbox"/> Science Notebook: Pages 92-97 <input type="checkbox"/> Online: PhET Simulation: Projectile Motion	<input type="checkbox"/> PhysicsLAB: On Target <input type="checkbox"/> PhysicsLAB: Centripetal Force	Students will explore centripetal force, centripetal acceleration, and circular motion.
Day 4 Lesson Two: Circular Motion	<input type="checkbox"/> Textbook: Pages 147-151 <input type="checkbox"/> Science Notebook: Pages 98-101		Students will explore classical relative

	<input type="checkbox"/> Online: PhET Simulation: Motion in 2D	<input type="checkbox"/> PhysicsLAB: Moving Reference Frame	motion in one and two dimensions.
Day 5 Lesson Three: Relative Velocity	<input type="checkbox"/> Textbook: Pages 152-157 <input type="checkbox"/> Science Notebook: Pages 102-106		
Day 6 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 158-159 <input type="checkbox"/> Module Assessment		
Module Seven: Gravitation 6 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Gravitation	<input type="checkbox"/> Textbook: Pages 161 <input type="checkbox"/> Science Notebook: Page 107	<input type="checkbox"/> Lab: Model Mercury's Motion	Students will explore Kepler's laws and Newton's law of universal gravitation. Students will explore the orbits of planets and satellites and the concept of gravitational field. They will also have a brief introduction to Einstein's theory of gravity.
Day 2-3 Lesson One: Planetary Motion and Gravitation	<input type="checkbox"/> Textbook: Pages 162-170 <input type="checkbox"/> Science Notebook: Pages 108-113 <input type="checkbox"/> Online: PhET Simulation: Gravitational Force Lab; Gravity and Orbits	<input type="checkbox"/> PhysicsLAB: Modeling Orbits <input type="checkbox"/> Lab: Weight in Free Fall; Weightless Water	
Day 4-5 Lesson Two: Naming Molecules	<input type="checkbox"/> Textbook: Pages 171-180 <input type="checkbox"/> Science Notebook: Pages 114-118	<input type="checkbox"/> PhysicsLAB: How can you measure mass? Inertial Mass and Gravitational Mass	
Day 6 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 181-182 <input type="checkbox"/> Module Assessment		
Module Eight: Rotational Motion 7 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Rotational Motion	<input type="checkbox"/> Textbook: Pages 184 <input type="checkbox"/> Science Notebook: Page 119	<input type="checkbox"/> Lab: Rolling Objects	Students will explore how rotational motion can be described in terms of angular displacement, angular velocity, angular
Day 2 Lesson One: Describing Rotational Motion	<input type="checkbox"/> Textbook: Pages 185-188 <input type="checkbox"/> Science Notebook: Pages 120-123	<input type="checkbox"/> Lab: Balancing Torques	

	<input type="checkbox"/> Online: PhET simulation: Ladybug Revolutions; Trig Tour	<input type="checkbox"/> PhysicsLAB: Torques	acceleration, and angular frequency.
Day 3-5 Lesson Two: Rotational Dynamics	<input type="checkbox"/> Textbook: Pages 189-199 <input type="checkbox"/> Science Notebook: Pages 124-130 <input type="checkbox"/> Online: PhET Simulation: Balancing Act, Torque	<input type="checkbox"/> Lab: Spinning Tops <input type="checkbox"/> PhysicsLAB: Equilibrium	<p>Students will explore Newton’s second law for rotational motion.</p> <p>Students will explore stability, static equilibrium, and rotating reference frames.</p>
Day 6 Lesson Three: Equilibrium	<input type="checkbox"/> Textbook: Pages 200-207 <input type="checkbox"/> Science Notebook: Pages 131-136		
Day 7 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 208-209 <input type="checkbox"/> Module Assessment		
STEM Unit Project	<input type="checkbox"/> Complete and Present Project: In Orbit		

Unit 3: Momentum and Energy

Module Nine: Momentum and Its Conservation
6 days

Days	Assignments	Labs	Focus
Day 1 Unit Opener	<input type="checkbox"/> Textbook: Pages 211 <input type="checkbox"/> Online: Project Planner: STEM Unit Project- Crash Safety		
Day 2 Module Opener: Momentum and Its Conservation	<input type="checkbox"/> Textbook: Pages 213 <input type="checkbox"/> Science Notebook: Page 137	<input type="checkbox"/> Lab: Colliding Objects <input type="checkbox"/> PhysicsLAB: Sticky Collisions	Students will explore impulse, momentum, and how they are related by the impulse-momentum theorem.
Day 3 Lesson One: Impulse and Momentum	<input type="checkbox"/> Textbook: Pages 214-221 <input type="checkbox"/> Science Notebook: Pages 138-143	<input type="checkbox"/> Lab: Momentum; Rebound Height	Students will explore the conservation of momentum in a variety of situations, including collisions, recoil, and gyroscopes.
Day 4-5 Lesson Two: Conservation of Momentum	<input type="checkbox"/> Textbook: Pages 222-232 <input type="checkbox"/> Science Notebook: Pages 144-150	<input type="checkbox"/> PhysicsLAB: Rotation of a Wheel	

Day 6 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 233-234 <input type="checkbox"/> Module Assessment		
Module Ten: Energy and Its Conservation 8 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Energy and Its Conservation	<input type="checkbox"/> Textbook: Pages 236 <input type="checkbox"/> Science Notebook: Page 151	<input type="checkbox"/> Lab: Energy and Falling <input type="checkbox"/> Lab: Force Applied at an Angle	Students will explore work, energy, and power, and the relationships among them.
Day 2-3 Lesson One: Work and Energy	<input type="checkbox"/> Textbook: Pages 237-247 <input type="checkbox"/> Science Notebook: Pages 152-158	<input type="checkbox"/> PhysicsLAB: Stair Climbing and Power	Students will explore different forms of energy, with an emphasis on macroscopic kinetic energy and gravitational potential energy.
Day 4 Lesson Two: The Many Forms of Energy	<input type="checkbox"/> Textbook: Pages 248-256 <input type="checkbox"/> Science Notebook: Pages 159-164	<input type="checkbox"/> Lab: Energy Exchange; Interrupted Pendulum	Students will explore the law of conservation of energy and use it to analyze collisions.
Day 5-6 Lesson Three: Conservation of Energy	<input type="checkbox"/> Textbook: Pages 257-266 <input type="checkbox"/> Science Notebook: Pages 165-171 <input type="checkbox"/> Online: PhET simulation: Energy Skate Park; Basics	<input type="checkbox"/> PhysicsLAB: Conservation of Energy	Students will explore the benefits of simple and compound machines.
Day 7 Lesson Four: Machines	<input type="checkbox"/> Textbook: Pages 267-275 <input type="checkbox"/> Science Notebook: Pages 172-178	<input type="checkbox"/> Lab: Wheel and Axle <input type="checkbox"/> PhysicsLAB: Lifting with Pulleys	
Day 8 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 276-277 <input type="checkbox"/> Module Assessment		
Module Eleven: Thermal Energy 6 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Thermal Energy	<input type="checkbox"/> Textbook: Pages 279 <input type="checkbox"/> Science Notebook: Page 179	<input type="checkbox"/> Lab: Thermal Energy Transfer	Students will explore thermal energy and how it is transferred.
Day 2-3 Lesson One: Temperature, Heat, and Thermal Energy	<input type="checkbox"/> Textbook: Pages 280-290	<input type="checkbox"/> PhysicsLAB: Heating and Cooling	Students will explore how changes of state and then first and

	<input type="checkbox"/> Science Notebook: Pages 180-186	<input type="checkbox"/> Lab: Convert Energy; Melting <input type="checkbox"/> PhysicsLAB: Heat of Fusion	second laws of thermodynamics.
Day 4-5 Lesson Two: Changes of State and Thermodynamics	<input type="checkbox"/> Textbook: Pages 291-301 <input type="checkbox"/> Science Notebook: Pages 187-192		
Day 6 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 302-303 <input type="checkbox"/> Module Assessment		
Module Twelve: States of Matter 8 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: States of Matter	<input type="checkbox"/> Textbook: Pages 305 <input type="checkbox"/> Science Notebook: Page 193	<input type="checkbox"/> Lab: Measuring Buoyancy	<p>Students will explore fluids, pressure, the gas laws, thermal expansion, and plasma.</p> <p>Students will explore cohesive and adhesive forces, evaporation, and condensation.</p> <p>Students will explore Pascal’s principle, buoyancy, Archimedes’ principle, and Bernoulli’s.</p> <p>Students will explore the molecular structure and thermal expansion of solids.</p>
Day 2-3 Lesson One: Properties of Fluids	<input type="checkbox"/> Textbook: Pages 306-313 <input type="checkbox"/> Science Notebook: Pages 194-200 <input type="checkbox"/> Online: PhET Simulation: Density; Gas Properties; States of Matter; Basics; Under Pressure	<input type="checkbox"/> Lab: Pressure <input type="checkbox"/> PhysicsLAB: Evaporative Colling <input type="checkbox"/> PhysicsLAB: The Buoyant Force of Water; Under Pressure	
Day 4 Lesson Two: Forces Within Liquids	<input type="checkbox"/> Textbook: Pages 314-317 <input type="checkbox"/> Science Notebook: Pages 201-203		
Day 5-6 Lesson Three: Fluids at Rest and in Motion	<input type="checkbox"/> Textbook: Pages 318-325 <input type="checkbox"/> Science Notebook: Pages 204-209 <input type="checkbox"/> Online: PhET Simulation: Buoyancy; Fluid Pressure and Flow		
Day 7 Lesson Four: Solids	<input type="checkbox"/> Textbook: Pages 326-331 <input type="checkbox"/> Science Notebook: Pages 210-214		

Day 8 Module Wrap-Up STEM Unit Project	<input type="checkbox"/> Textbook: Pages 332-333 <input type="checkbox"/> Module Assessment <input type="checkbox"/> Complete and present STEM unit project: Crash Safety		
Unit 4: Waves and Light			
Module Thirteen: Vibrations and Waves 6 days			
Days	Assignments	Labs	Focus
Day 1 Unit Opener	<input type="checkbox"/> Textbook: Page 335 <input type="checkbox"/> Online: Project Planner: STEM Unit Project- What's Inside Earth?	<input type="checkbox"/> Lab: Wave Interaction <input type="checkbox"/> PhysicsLAB: Pendulum Vibrations	
Day 2 Module Opener: Vibrations and Waves	<input type="checkbox"/> Textbook: Page 337 <input type="checkbox"/> Science Notebook: Page 215	<input type="checkbox"/> Lab: Wave interaction; Wave Reflection	<p>Students will explore periodic motion, including the specific cases of masses on spring, pendulums, and resonance.</p> <p>Students will explore the properties of mechanical waves, including amplitude, wavelength, frequency, wave speed, and period.</p> <p>Students will explore how the reflection, refraction, and interference of waves.</p>
Day 3 Lesson One: Periodic Motion	<input type="checkbox"/> Textbook: Pages 338-343 <input type="checkbox"/> Science Notebook: Pages 216-220 <input type="checkbox"/> Online: PhET Simulation: Hooke's Law; Pendulum Lab	<input type="checkbox"/> PhysicsLAB: Interference and Diffraction; Reflection and Refraction	
Day 4 Lesson Two: Wave Properties	<input type="checkbox"/> Textbook: Pages 344-349 <input type="checkbox"/> Science Notebook: Pages 221-225 <input type="checkbox"/> Online: PhET Simulation: Wave on a String		
Day 5 Lesson Three: Wave Behavior	<input type="checkbox"/> Textbook: Pages 350-356 <input type="checkbox"/> Science Notebook: Pages 226-230 <input type="checkbox"/> Online: PhET simulation: Wave Interference		

Day 6 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 357-358 <input type="checkbox"/> Module Assessment		
Module Fourteen: Sound 5 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Sound	<input type="checkbox"/> Textbook: Pages 360 <input type="checkbox"/> Science Notebook: Page 231	<input type="checkbox"/> Lab: Producing Musical Notes	<p>Students will explore the properties of sound waves, how humans perceive them, and the doppler effect.</p> <p>Students will explore how sound is created and how musical instruments work.</p>
Day 2 Lesson One: Properties and Detection of Sound	<input type="checkbox"/> Textbook: Pages 361-368 <input type="checkbox"/> Science Notebook: Pages 232-237 <input type="checkbox"/> Online: PhET Simulation: Sound	<input type="checkbox"/> Lab: Sound Characteristics <input type="checkbox"/> PhysicsLAB: What is a decibel?	
Day 3-4 Lesson Two: The Physics of Music	<input type="checkbox"/> Textbook: Pages 369-380 <input type="checkbox"/> Science Notebook: Pages 238-244	<input type="checkbox"/> Lab: Sounds Good <input type="checkbox"/> PhysicsLAB: Speed of Sound; How fast does sound travel?	
Day 5 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 381-382 <input type="checkbox"/> Module Assessment		
Module Fifteen: Fundamentals of Light 6 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Fundamentals of Light	<input type="checkbox"/> Textbook: Pages 384 <input type="checkbox"/> Science Notebook: Page 245	<input type="checkbox"/> Lab: Light's Path <input type="checkbox"/> Lab: The Speed of Light	<p>Students will explore the ray model of how light travels, illumination, and the speed of light.</p> <p>Students will explore how the wave nature of light explain diffraction, color, polarization, and the Doppler shift of light.</p>
Day 2-3 Lesson One: Illumination	<input type="checkbox"/> Textbook: Pages 385-393 <input type="checkbox"/> Science Notebook: Pages 246-252	<input type="checkbox"/> Lab: Color by Temperature; Polarization of Reflected Light	
Day 4-5 Lesson Two: The Wave Nature of Light	<input type="checkbox"/> Textbook: Pages 394-404 <input type="checkbox"/> Science Notebook: Pages 253-258 <input type="checkbox"/> Online: PhET Simulation: Color Vision	<input type="checkbox"/> PhysicsLAB: Polarization; Reducing Glare	
Day 6 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 405-406 <input type="checkbox"/> Module Assessment		

Module Sixteen: Reflection and Refraction			
10 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Reflection and Refraction	<input type="checkbox"/> Textbook: Pages 408 <input type="checkbox"/> Science Notebook: Page 259	<input type="checkbox"/> Lab: Images from Mirrors <input type="checkbox"/> Lab: Virtual Image Position	Students will explore the law of reflection and images formed by plane mirrors.
Day 2 Lesson One: Reflection of Light	<input type="checkbox"/> Textbook: Pages 409-414 <input type="checkbox"/> Science Notebook: Pages 260-265	<input type="checkbox"/> PhysicsLAB: Position of Mirror Reflection	Students will explore how curved mirrors form a variety of images.
Day 3-5 Lesson Two: Curved Mirrors	<input type="checkbox"/> Textbook: Pages 415-424 <input type="checkbox"/> Science Notebook: Pages 266-272	<input type="checkbox"/> Lab: Finding the Focal Point	Students will explore Snell's law of refraction, total internal reflection, and the dispersion of light.
Day 6 Lesson Three: Refraction of Light	<input type="checkbox"/> Textbook: Pages 425-431 <input type="checkbox"/> Science Notebook: Pages 273-277 <input type="checkbox"/> Online: PhET Simulation: Bending Light	<input type="checkbox"/> Lab: Personal Rainbow <input type="checkbox"/> Lab: Lens Masking Effects; Water Lenses	Students will explore how lenses, including those in the human eye and in optical equipment, are used to form images.
Day 7-9 Lesson Four: Convex and Concave Lenses	<input type="checkbox"/> Textbook: Pages 432-442 <input type="checkbox"/> Science Notebook: Pages 273-277		
Day 10 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 443-444 <input type="checkbox"/> Module Assessment		
Module Seventeen: Interference and Diffraction			
7 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Interference and Diffraction	<input type="checkbox"/> Textbook: Pages 446 <input type="checkbox"/> Science Notebook: Page 287	<input type="checkbox"/> Lab: Patterns of Light <input type="checkbox"/> Lab: Soap Film	Students will explore double-slit interference and thin-film interference.
Days 2-3 Lesson One: Interference	<input type="checkbox"/> Textbook: Pages 447-455 <input type="checkbox"/> Science Notebook: Pages 288-294	<input type="checkbox"/> PhysicsLAB: Holograms; What is the wavelength?	Students will explore single-slit diffraction and diffraction gratings.
Days 4-5 Lesson Two: Diffraction	<input type="checkbox"/> Textbook: Pages 456-465		

	<input type="checkbox"/> Science Notebook: Pages 295-300	<input type="checkbox"/> Lab: Diffraction Gratings; Retinal Projection Screen	
Day 6 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 466-467 <input type="checkbox"/> Module Assessment		
Day 7 STEM Unit Project	<input type="checkbox"/> Complete and present STEM Unit Project- What's Inside Earth?		
Unit 5: Electricity and Magnetism			
Module Eighteen: Electrostatics 9 days			
Days	Assignments	Labs	Focus
Day 1 Unit Opener	<input type="checkbox"/> Textbook: Pages 469 <input type="checkbox"/> Online: Project Planner: STEM Unit Project: From Raw Resource to Usable Energy		
Day 2 Module Opener: Electrostatics	<input type="checkbox"/> Textbook: Pages 471 <input type="checkbox"/> Science Notebook: Page 301	<input type="checkbox"/> Lab: Another Field Force	Students will explore the evidence we have for electric charge and how some materials are electric conductors while others are electric insulators.
Day 3 Lesson One: Electric Charge	<input type="checkbox"/> Textbook: Pages 472-476 <input type="checkbox"/> Science Notebook: Pages 302-305 <input type="checkbox"/> Online: PhET Simulation: Static Electricity	<input type="checkbox"/> PhysicsLAB: Charged Objects <input type="checkbox"/> Lab: Flying Objects; Investigating Induction and Conduction	Students will explore how objects can be charged, as well as Coulomb's Law.
Day 4-5 Lesson Two: Electrostatic Force	<input type="checkbox"/> Textbook: Pages 477-485 <input type="checkbox"/> Science Notebook: Pages 306-312	<input type="checkbox"/> PhysicsLAB: Charge It Up	Students will explore electric fields and how they can be modeled.
Day 6 Lesson Three: Measuring Electric Fields	<input type="checkbox"/> Textbook: Pages 486-492 <input type="checkbox"/> Science Notebook: Pages 313-317 <input type="checkbox"/> Online: PhET Simulation: Charges and Fields	<input type="checkbox"/> Lab: Construct a Capacitor, Electric Fields	Students will explore electrical potential energy, capacitors, and how the charge of

Day 7-8 Lesson Four: Applications of Electric Fields	<input type="checkbox"/> Textbook: Pages 493-504 <input type="checkbox"/> Science Notebook: Pages 318-324 <input type="checkbox"/> Online: PhET Simulation: Capacitors	<input type="checkbox"/> PhysicsLAB: Energizing Capacitors; Storing Charge	an electron was determined.
Day 9 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 505-506 <input type="checkbox"/> Module Assessment		
Module Nineteen: Electric Current and Circuits 8 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Electric Current and Circuits	<input type="checkbox"/> Textbook: Pages 508 <input type="checkbox"/> Science Notebook: Page 325	<input type="checkbox"/> Lab: Light the Bulb <input type="checkbox"/> Lab: Current Affairs; Making Electric Energy	Students will explore current, electrical energy, circuit diagrams and Ohm's law.
Day 2-3 Lesson One: Current and Circuits	<input type="checkbox"/> Textbook: Pages 509-519 <input type="checkbox"/> Science Notebook: Pages 326-333 <input type="checkbox"/> Online: PhET Simulation: Ohm's Law; Resistance in a Wire	<input type="checkbox"/> PhysicsLAB: Energy Conservation <input type="checkbox"/> Lab: Parallel Circuit Measurements; Parallel Resistance	Students will explore the relationships between electrical energy, power, potential difference, and resistance.
Day 4 Lesson Two: Using Electrical Energy	<input type="checkbox"/> Textbook: Pages 520-524 <input type="checkbox"/> Science Notebook: Pages 334-338	<input type="checkbox"/> PhysicsLAB: Parallel Resistors	Students will explore series and parallel circuits and analyze them using Kirchhoff's rules.
Day 5-6 Lesson Three: Simple Circuits	<input type="checkbox"/> Textbook: Pages 525-535 <input type="checkbox"/> Science Notebook: Pages 339-346	<input type="checkbox"/> PhysicsLAB: Series and Parallel Circuits	Students will explore electrical safety devices and combined circuits, including ammeters and voltmeters.
Day 7 Lesson Four: Applications of Circuits	<input type="checkbox"/> Textbook: Pages 536-542 <input type="checkbox"/> Science Notebook: Pages 347-352		
Day 8 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 543-544 <input type="checkbox"/> Module Assessment		

Module Twenty: Magnetism (Magnetic Fields)			
5 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Magnetism (Magnetic Fields)	<input type="checkbox"/> Textbook: Pages 546 <input type="checkbox"/> Science Notebook: Page 353	<input type="checkbox"/> Lab: Direction of Magnetic Fields <input type="checkbox"/> Lab: 3-D Magnetic Fields; Magnetic Domains	<p>Students will explore the properties of magnets, magnetic domains, magnetic fields, and electromagnets.</p> <p>Students will explore the effects of magnetic forces on current-carrying wires and moving charged particles, as well as related applications, such as galvanometers and motors.</p>
Day 2 Lesson One: Understanding Magnetism	<input type="checkbox"/> Textbook: Pages 547-555 <input type="checkbox"/> Science Notebook: Pages 354-359 <input type="checkbox"/> Online: PhET Simulation: Magnets and Electromagnets	<input type="checkbox"/> PhysicsLAB: Current and Field Strength; Make an Electromagnet	
Day 3-4 Lesson Two: Applying Magnetic Fields	<input type="checkbox"/> Textbook: Pages 556-565 <input type="checkbox"/> Science Notebook: Pages 360-366		
Day 5 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 566-567 <input type="checkbox"/> Module Assessment		
Module Twenty-One: Electromagnetism			
9 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Electromagnetism	<input type="checkbox"/> Textbook: Pages 569 <input type="checkbox"/> Science Notebook: Page 367	<input type="checkbox"/> Lab: Changing Magnetic Fields	<p>Students will explore how changing magnetic fields induce currents and how generators work.</p> <p>Students will explore Lenz's law, eddy currents, self-inductance, and transformers.</p> <p>Students will explore Thomson's experiments with cathode ray tubes and mass spectrometers, both of which demonstrate how</p>
Day 2-3 Lesson One: Inducing Currents	<input type="checkbox"/> Textbook: Pages 570-577 <input type="checkbox"/> Science Notebook: Pages 368-372 <input type="checkbox"/> Online: PhET Simulation: Faraday's Law; Generator	<input type="checkbox"/> Lab: Slow Motor <input type="checkbox"/> PhysicsLAB: Induction and Transformers; Swinging Coils	
Day 4 Lesson Two: Applications of Induced Currents	<input type="checkbox"/> Textbook: Pages 578-585 <input type="checkbox"/> Science Notebook: Pages 373-377	<input type="checkbox"/> Lab: Moving Charge Particles <input type="checkbox"/> PhysicsLAB: Mass of an Electron	
Day 5-6 Lesson Three: Electric and Magnetic Forces on Particles	<input type="checkbox"/> Textbook: Pages 586-593 <input type="checkbox"/> Science Notebook: Pages 378-382	<input type="checkbox"/> Lab: Wave Signals	

Day 7 Lesson Four: Electric and Magnetic Fields in Space	<input type="checkbox"/> Textbook: Pages 594-605 <input type="checkbox"/> Science Notebook: Pages 383-386 <input type="checkbox"/> Online; PhET Simulation: Radio Waves and Electromagnetic Fields	<input type="checkbox"/> PhysicsLAB: Blocking Waves	<p>charged particle behave in electric and magnetic fields.</p> <p>Students will explore the properties and technological applications of electromagnetic waves.</p>
Day 8 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 606-607 <input type="checkbox"/> Module Assessment		
Day 9 STEM Unit Project	<input type="checkbox"/> Complete and present STEM Unit Project- From Raw Resource to Usable Energy		
Unit 6: Subatomic Physics			
Module Twenty-Two: Quantum Theory and the Atom 11 days			
Days	Assignments	Labs	Focus
Day 1 Unit Opener	<input type="checkbox"/> Textbook: Page 609 <input type="checkbox"/> Online: Project Planner: STEM Unit Project: The History of Everything		
Day 2 Module Opener: Quantum Theory and the Atom	<input type="checkbox"/> Textbook: Pages 611 <input type="checkbox"/> Science Notebook: Page 395	<input type="checkbox"/> Lab: Lightbulb Spectrum <input type="checkbox"/> Lab: Glows in the Dark; Modeling the Quantum	Students will explore the basics of quantized energy, the photoelectric effect, and the Compton effect.
Day 3-5 Lesson One: A Particle Model of Waves	<input type="checkbox"/> Textbook: Pages 612-624 <input type="checkbox"/> Science Notebook: Pages 396-404 <input type="checkbox"/> Online: PhET Simulation: Blackbody Spectrum; Photoelectric Effect	<input type="checkbox"/> Lab: Bright Line Spectra <input type="checkbox"/> PhysicsLAB: Electron Transitions; Emission Spectra	Students will explore de Broglie waves and Heisenberg uncertainty principle.
Day 6 Lesson Two: Matter Waves	<input type="checkbox"/> Textbook: Pages 625-627 <input type="checkbox"/> Science Notebook: Pages 405-408		Students will explore the experiments and evidence that led to the development

Day 7-9 Lesson Three: Bohr's Model of the Atom	<input type="checkbox"/> Textbook: Pages 628-640 <input type="checkbox"/> Science Notebook: Pages 409-417 <input type="checkbox"/> Online: PhET Simulation: Build an Atom; Models of the Hydrogen Atom; Rutherford Scattering	<input type="checkbox"/> Lab: Diffraction of Laser Light	<p>atomic model from the plum pudding model to the nuclear model to Bohr's model.</p> <p>Students will explore how quantum mechanics include the current model of the atom and how lasers work.</p>
Day 10 Lesson Four: The Quantum Model of the Atom	<input type="checkbox"/> Textbook: Pages 641-646 <input type="checkbox"/> Science Notebook: Pages 418-422 <input type="checkbox"/> Online: PhET Simulation: Lasers		
Day 11 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 647-648 <input type="checkbox"/> Module Assessment		
Module Twenty-Three: Solid-State Electronics			
5 days			
Days	Assignments	Labs	Focus
Day 1 Module Opener: Solid-State Electronics	<input type="checkbox"/> Textbook: Pages 650 <input type="checkbox"/> Science Notebook: Page 423	<input type="checkbox"/> Lab: Conduction in a Diode	<p>Students will explore how the band theory of solids explains the difference between conductors, semiconductors, and insulators, and that doping can change conductivity of a semiconductor.</p> <p>Students will explore the basic functions of diodes and transformers, and the development of the integrated circuit.</p>
Day 2-3 Lesson One: Conduction in Solids	<input type="checkbox"/> Textbook: Pages 651-659 <input type="checkbox"/> Science Notebook: Pages 424-430 <input type="checkbox"/> Online: PhET Simulation: Semiconductors	<input type="checkbox"/> Lab: Optoisolator <input type="checkbox"/> Lab: Red Light <input type="checkbox"/> PhysicsLAB: Computer Logic; Diode Current and Potential Difference	
Day 4 Lesson Two: Electronic Components	<input type="checkbox"/> Textbook: Pages 660-667 <input type="checkbox"/> Science Notebook: Pages 431-436		
Day 5 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 668-669 <input type="checkbox"/> Module Assessment		

Module Twenty-Four: Nuclear and Particle Physics
7 days

Days	Assignments	Labs	Focus
Day 1 Module Opener: Nuclear and Particle Physics	<input type="checkbox"/> Textbook: Pages 671 <input type="checkbox"/> Science Notebook: Page 437	<input type="checkbox"/> Lab: A Nuclear Model <input type="checkbox"/> Lab: Modeling Radioactive Decay	Students will explore the structure of the nucleus, the forces acting on the particles within it, and the energy binding its particles together.
Day 2 Lesson One: The Nucleus	<input type="checkbox"/> Textbook: Pages 672-678 <input type="checkbox"/> Science Notebook: Pages 438-442 <input type="checkbox"/> Online: PhET Simulation: Atomic Interactions; Isotopes and Atomic Mass	<input type="checkbox"/> PhysicsLAB: Common Sources of Radiation <input type="checkbox"/> Lab: What's in the background	Students will explore radioactive decay, fission, and fusion.
Day 3-4 Lesson Two: Nuclear Decay and Reactions	<input type="checkbox"/> Textbook: Pages 679-690 <input type="checkbox"/> Science Notebook: Pages 4443-449 <input type="checkbox"/> Online: PhET simulation: Alpha Decay; Beta Decay; Nuclear Fission; Radioactive Dating Game		Students will explore how scientists use particle accelerators and detectors to determine the fundamental make up of the universe, which is described by the Standard Model.
Day 5 Lesson Three: The Building Blocks of Matter	<input type="checkbox"/> Textbook: Pages 691-701 <input type="checkbox"/> Science Notebook: Pages 450-456		
Day 6 Module Wrap-Up	<input type="checkbox"/> Textbook: Pages 702-703 <input type="checkbox"/> Module Assessment		
Day 7 STEM Unit Project	<input type="checkbox"/> Complete and present STEM Unit Project: The History of Everything		