HMH

HMH Science Dimensions®

Physics

Scope and Sequence

Unit 1: Physics and Engineering

Lesson 1.1 Engineering Design

Exploration 1 Solving an Everyday Problem
Exploration 2 The Engineering Design Process
Exploration 3 Science, Engineering, and Technology
Exploration 4 Case Study: Bridge 9340
Take it Further Careers in Engineering: Civil Engineer

Lesson 1.2 Modeling Motion

Exploration 1 Representing Motion
Exploration 2 Acceleration in One Dimension
Exploration 3 Motion in Two Dimensions
Exploration 4 Motion of Humanitarian Airdrop Packages
Take it Further Hands-On Lab: Hitting the Mark

Lesson 1.3 Effects of Forces

Exploration 1 Representing Forces
Exploration 2 Exploring Force and Motion
Exploration 3 Connecting Force and Motion
Exploration 4 Analyzing Action and Reaction
Exploration 5 Forces and Stresses in Engineering
Take it Further Guided Research: Accelerometers

Unit 2: Energy and Motion

Lesson 2.1 Momentum and Collisions

Exploration 1 Quantifying Momentum
Exploration 2 Types of Collisions
Exploration 3 Relating Impulse and Momentum
Exploration 4 Modeling Impact Protection
Take it Further Careers in Engineering: Rocket Engineer

Lesson 2.2 Analyzing Energy in Systems

Exploration 1 Energy and Systems
Exploration 2 Predict the Result of a Collision
Exploration 3 Quantifying Energy
Exploration 4 Case Study: Energy for Vehicles
Take it Further Hands-On Activity: Transforming Potential Energy

Thing Explainer
Illustrations from xkcd.com author Randall Munroe featured in the textbook!

Lesson 2.3 Transferring Thermal Energy
Exploration 1 Temperature and Particle Motion
Exploration 2 Energy in Real-World Systems
Exploration 3 Useful Energy in Heat Engines
Exploration 4 Case Study: Jet Engines Improvements
Take it Further Guided Research: Heat Engines

Unit 3: Field Forces and Energy

Lesson 3.1 Mass and Gravitational Fields
Exploration 1 Observing Gravity
Exploration 2 Representing Orbits
Exploration 3 Quantifying Gravitational Force
Exploration 4 Modeling Gravitational Effects
Take it Further Data Analysis: Gravity and Tides

Lesson 3.2 Modeling Electric and Magnetic Fields
Exploration 1 Exploring Magnets and Electric Charges
Exploration 2 Mapping Electric and Magnetic Fields
Exploration 3 Quantifying Forces Due to Fields
Exploration 4 Exploring Energy and Fields
Take it Further Guided Research: Electric Phenomena

Unit 4: Electromagnetism and Generators

Lesson 4.1 Flow of Electrical Energy
Exploration 1 Describing Electrical Energy
Exploration 2 Controlling the Flow of Electrical Energy
Exploration 3 Case Study: Developing the Light Bulb
Take it Further Careers in Science: Electrician

Lesson 4.2 Electromagnets and Inducing Current
Exploration 1 Generating Magnetic Fields
Exploration 2 Generating Current Using Magnets
Exploration 3 Designing with Electromagnetism
Take it Further Careers in Science: Radiologist

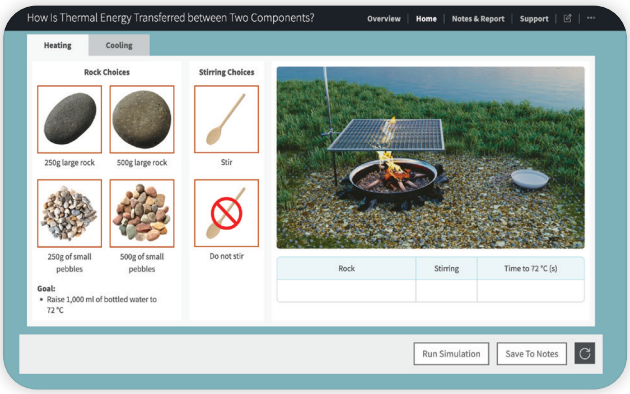
Lesson 4.3 Solutions for Electrical Energy Generation
Exploration 1 Producing Electrical Energy
Exploration 2 Storing and Distributing Energy
Exploration 3 Evaluating Energy Solutions
Take it Further Guided Research: Electricity in Your Community

Unit 5: Wave Energy and Communication

Lesson 5.1 Modeling and Using Waves
Exploration 1 Classifying Waves
Exploration 2 Modeling Waves
Exploration 3 Case Study: March 2011 Tsunami
Exploration 4 Wave Behavior
Exploration 5 Applying Wave Behaviors
Take it Further Guided Research: Sound Waves around Black Holes

Lesson 5.2 Effects of Electromagnetic Radiation
Exploration 1 Electromagnetic Radiation and Matter
Exploration 2 Studying Electromagnetic Spectra
Exploration 3 Case Study: The Dual Nature of Light
Take it Further Guided Research: Laser Diffraction Analyzer

Lesson 5.3 Optimizing Information Technologies
Exploration 1 Energy and Information
Exploration 2 Communicating with Waves
Exploration 3 Waves in Technology
Take it Further Guided Research: Information from Waves



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