

HMH SCIENCE **DIMENSIONS**™

ENGINEERED *for the* **NEXT GENERATION**

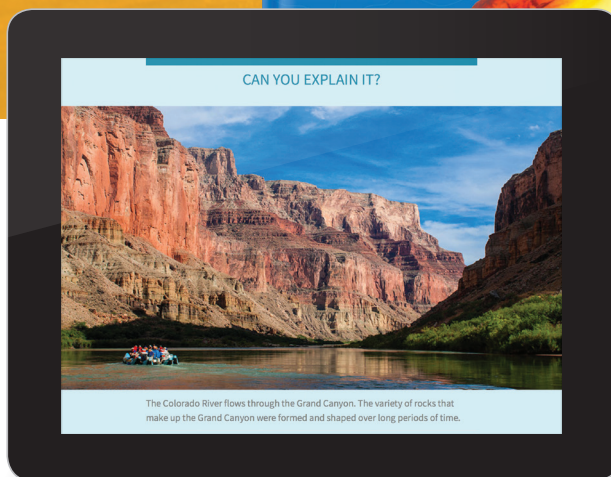
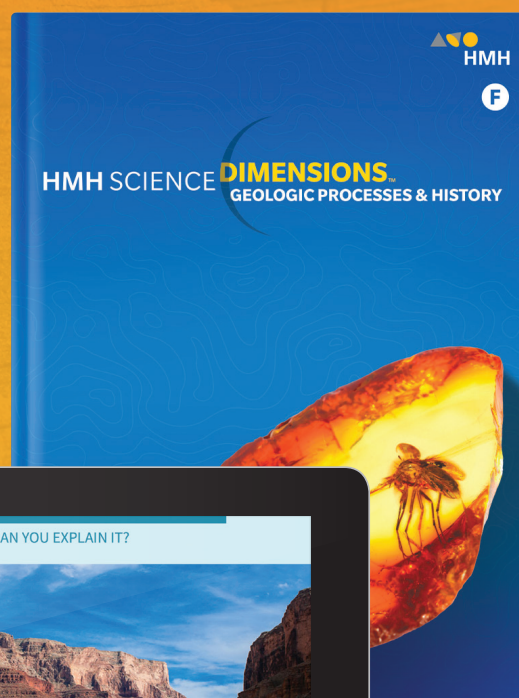
Scope and Sequence

GRADES 6–8

Engineering, Life, Earth
& Space, and Physical
Science Modules

**Map your journey
through 6–8 science with
this groundbreaking
spiraled curriculum.**

A guide to units, lessons, hands-on
activities, and correlated standards



Engineering Design

MODULE A: ENGINEERING & SCIENCE

Unit 1: Introduction to Engineering and Science

ETS1-1, ETS1-2, ETS1-3, ETS1-4

Lesson 1: Engineering, Science, and Society

Hands-on Lab: Investigate a Technology Inspired by Nature

Lesson 2: Systems and System Models

Hands-on Lab: Investigate Components, Inputs, and Outputs of a System

Lesson 3: The Engineering Design Process

Hands-on Lab: Design a Bicycle Helmet

Unit 2: The Practices of Engineering

ETS1-1, ETS1-2, ETS1-3, ETS1-4

Lesson 1: Defining Engineering Problems

Hands-on Lab: Design a Model Car - Part 1

Lesson 2: Developing and Testing Solutions

Hands-on Lab: Design a Model Car - Part 2

Lesson 3: Optimizing Solutions

Hands-on Lab: Design a Model Car - Part 3



Life Science

MODULE B: CELLS & HEREDITY

Unit 1: Cells

LS1-1, LS1-2

Lesson 1: The Characteristics of Cells

Hands-on Lab: Cells with Microscopes

Lesson 2: Cell Structures and Function

Hands-on Lab: Cell Models to Investigate Cell Size

Unit 2: Organisms as Systems

LS1-3, LS1-8

Lesson 1: Levels of Organization in Organisms

Hands-on Lab: Model Tissue Structure and Function

Lesson 2: Plant Bodies as Systems

Hands-on Lab: Observe Transport

Lesson 3: Animal Bodies as Systems

Hands-on Lab: Model Tissue Structure and Function

Lesson 4: Information Processing in Animals

Hands-on Lab: Measure Reaction Time

Unit 3: Reproduction, Heredity, and Growth

LS1-4, LS1-5, LS3-2

Lesson 1: Inheritance

Hands-on Lab: Model Genes and Traits

Lesson 2: Asexual and Sexual Reproduction

Hands-on Lab: Model Sexual Reproduction

Lesson 3: Plant Reproduction and Growth

Hands-on Lab: Investigate Flower Parts

Lesson 4: Animal Reproduction and Growth

Hands-on Lab: Model the Growth of an Animal

MODULE C: ECOLOGY & THE ENVIRONMENT

Unit 1: Matter and Energy in Living Systems

LS1-6, LS1-7, LS2-3

Lesson 1: Matter and Energy in Organisms

Hands-on Lab: Investigate Decomposition

Lesson 2: Photosynthesis and Cellular Respiration

Hands-on Lab: Investigate the Effect of Sunlight on Elodea

Lesson 3: Matter and Energy in Ecosystems

Hands-on Lab: Model Energy Flow in an Ecosystem

Unit 2: Relationships in Ecosystems

LS2-1, LS2-2

Lesson 1: Parts of an Ecosystem

Hands-on Lab: Investigate Your Schoolyard

Lesson 2: Resource Availability in Ecosystems

Hands-on Lab: Investigating Effects of Limited Resources

Lesson 3: Patterns of Interaction

Hands-on Lab: Simulate Feeding Relationships

Unit 3: Ecosystem Dynamics

LS2-4, LS2-5

Lesson 1: Biodiversity in Ecosystems

Hands-on Lab: Measure Biodiversity

Lesson 2: Changes in Ecosystems

Hands-on Lab: What Factors Influence a Population Change?

Lesson 3: Engineer It • Maintaining Biodiversity

Hands-on Lab: Model Habitat Fragmentation



MODULE D: THE DIVERSITY OF LIVING THINGS

Unit 1: The History of Life on Earth

LS4-1, LS4-2, LS4-3

Lesson 1: The Fossil Record

Hands-on Lab: Model Fossil Formation

Lesson 2: Patterns of Change in Life on Earth

Hands-on Lab: Model Analysis of the Fossil Record

Lesson 3: Evidence of Common Ancestry

Hands-on Lab: Make Inferences from Evidence

Unit 2: Evolution

LS3-1, LS4-4, LS4-6

Lesson 1: Genetic Change and Traits

Hands-on Lab: Model Protein Folding

Lesson 2: Natural Selection

Hands-on Lab: Model Natural Selection in a Population

Lesson 3: Speciation and Extinction

Hands-on Lab: Analyze Speciation of Salamanders

Unit 3: Human Influence on Inheritance

LS4-5

Lesson 1: Artificial Selection

Hands-on Lab: Analyze Selected Traits in Vegetables

Lesson 2: Biotechnology and Inheritance

Hands-on Lab: Modify Bacteria

Earth and Space Sciences

MODULE E: EARTH'S WATER & ATMOSPHERE

Unit 1: Circulation of Earth's Air and Water

ESS2-4, ESS2-6

Lesson 1: Circulation in Earth's Atmosphere

Hands-on Lab: Experiment with Wind

Lesson 2: Circulation in Earth's Oceans

Hands-on Lab: Explore Density Differences in Water

Lesson 3: The Water Cycle

Hands-on Lab: Rain in a Jar

Unit 2: Weather and Climate

ESS2-5, ESS2-6

Lesson 1: Influences on Weather

Hands-on Lab: Model an Air Mass Interaction

Lesson 2: Weather Prediction

Hands-on Lab: Predict Costs Using a Model

Lesson 3: Influences on Climate

Hands-on Lab: Model Your Climate

MODULE F: GEOLOGIC PROCESSES & HISTORY

Unit 1: The Dynamic Earth

ESS2-1, ESS2-2, ESS2-3

Lesson 1: Weathering, Erosion, and Deposition

Hands-on Lab: Modeling Erosion and Deposition

Lesson 2: The Rock Cycle

Hands-on Lab: Model Crystal Formation

Lesson 3: Earth's Plates

Hands-on Lab: Model the Movement of Continents

Lesson 4: Earth's Changing Surface

Hands-on Lab: Analyze Visual Evidence

Unit 2: Earth Through Time

ESS1-4

Lesson 1: The Age of Earth's Rocks

Hands-on Lab: Model Rock Layers to Determine Relative Age

Lesson 2: Earth's History

Hands-on Lab: Construct a Timeline

MODULE G: EARTH & HUMAN ACTIVITY

Unit 1: Earth's Natural Hazards

ESS3-2

Lesson 1: Natural Hazards

Hands-on Lab: Assess Building Sites Near a Volcano

Lesson 2: Natural Hazard Prediction

Hands-on Lab: Predict a Landslide

Lesson 3: Engineer It • Reducing the Effects of Natural Hazards

Hands-on Lab: Develop and Evaluate a Flood Solution

Unit 2: Resources in Earth's Systems

ESS3-1

Lesson 1: Natural Resources

Hands-on Lab: Explore Replacement of a Natural Resource

Lesson 2: The Distribution of Natural Resources

Hands-on Lab: Model Recharge and Withdrawal in an Aquifer

Unit 3: Using Resources

ESS3-4

Lesson 1: Human Population and Resource Use

Hands-on Lab: Model Resource Use

Hands-on Lab: Model Factors in Resource Use

Lesson 2: Resource Use and Earth's Systems

Hands-on Lab: Analyze Your Impact

Unit 4: Human Impacts on Earth Systems

ESS3-3, ESS3-5

Lesson 1: Human Impacts on the Environment

Hands-on Lab: Model Ocean Pollution from Land

Lesson 2: Engineer It • Reducing Human Impacts on the Environment

Hands-on Lab: Design a Method to Monitor Solid Waste from a School

Hands-on Lab: Evaluate a Method to Reduce the Impact of Solid Waste on the Environment

Lesson 3: Climate Change

Hands-on Lab: Model the Greenhouse Effect



MODULE H: SPACE SCIENCE

Unit 1: Patterns in the Solar System

ESS1-1

Lesson 1: The Earth-Sun-Moon System

Hands-on Lab: Model the Apparent Motion of the Sun

Hands-on Lab: Model Moon Phases

Hands-on Lab: Model Solar and Lunar Eclipses

Lesson 2: Seasons

Hands-on Lab: Model Sunlight Distribution

Hands-on Lab: Model Patterns of Sunlight Throughout Earth's Revolution

Unit 2: The Solar System and Universe

ESS1-2, ESS1-3

Lesson 1: The Formation of the Solar System

Hands-on Lab: Model Nebular Disk Formation

Lesson 2: Earth and the Solar System

Hands-on Lab: Parallax

Hands-on Lab: Model the Solar System

Lesson 3: Earth's Place in the Universe

Hands-on Lab: Determine Location within a Field of Objects

Lesson 4: Gravity in the Universe

Hands-on Lab: Explore the Motion of a Falling Object

Physical Science

MODULE I: ENERGY & ENERGY TRANSFER

Unit 1: Energy

PS3-1, PS3-2

Lesson 1: Introduction to Energy

Hands-on Lab: Investigate Energy in a Rollback Can

Lesson 2: Kinetic and Potential Energy

Hands-on Lab: Analyze Energy in Systems

Lesson 3: Engineer It • Transforming Potential Energy

Hands-on Lab: Design a Device to Demonstrate Potential Energy

Hands-on Lab: Optimize a Device to Demonstrate Potential Energy

Unit 2: Energy Transfer

PS3-3, PS3-4, PS3-5

Lesson 1: Changes in Energy

Hands-on Lab: Investigate the Transfer of Energy

Lesson 2: Temperature and Heat

Hands-on Lab: Compare Thermal Energy in an Object

Lesson 3: Engineer It • Energy Transfer in Systems

Hands-on Lab: Examine the Transfer of Thermal Energy Through Radiation

Hands-on Lab: Design and Test an Insulated Container

MODULE J: CHEMISTRY

Unit 1: The Structure of Matter

PS1-1

Lesson 1: The Properties of Matter

Hands-on Lab: Measuring Density

Lesson 2: Atoms and Elements

Hands-on Lab: Compare Densities

Lesson 3: Molecules and Extended Structures

Hands-on Lab: Model Molecules

Unit 2: States of Matter and Changes of State

PS1-4

Lesson 1: States of Matter

Hands-on Lab: Observe States of Matter

Lesson 2: Changes of State

Hands-on Lab: Investigate a Change of State

Unit 3: Chemical Processes and Equations

PS1-2, PS1-5, PS1-6

Lesson 1: Chemical Reactions

Hands-on Lab: Observe Substances Before and After a Change

Lesson 2: Chemical Equations

Hands-on Lab: Observing a Chemical Reaction

Lesson 3: Engineer It • Thermal Energy and Chemical Processes

Hands-on Lab: Choosing a Chemical Process

Unit 4: The Chemistry of Materials

PS1-3

Lesson 1: Natural and Synthetic Materials

Hands-on Lab: Make a Synthetic Material

Lesson 2: Engineer It • The Life Cycle of Synthetic Materials

Hands-on Lab: Sort Synthetic Materials Using Properties

MODULE K: FORCES, MOTION & FIELDS

Unit 1: Forces and Motion

PS2-1, PS2-2, PS2-4

Lesson 1: Introduction to Forces

Hands-on Lab: Observe Everyday Forces

Hands-on Lab: Investigate Friction

Lesson 2: Gravity and Friction

Hands-on Lab: Investigate Falling Objects: Mass

Hands-on Lab: Investigate Friction

Hands-on Lab: Investigate Falling Objects: Air

Lesson 3: Newton's Laws of Motion

Hands-on Lab: Investigate Motion

Lesson 4: Engineer It • Collisions Between Objects

Hands-on Lab: Protect an Egg

Unit 2: Electric and Magnetic Forces

PS2-3, PS2-5

Lesson 1: Magnetic Forces

Hands-on Lab: Explore the Behavior of Magnets

Hands-on Lab: Analyzing the Magnetic Force

Hands-on Lab: Magnet Strength and the Magnetic Force



Lesson 2: Electric Forces

Hands-on Lab: Explore the Electric Force

Hands-on Lab: Distance Between Charged Objects

Hands-on Lab: Magnitude of the Electric Charge

Lesson 3: Fields

Hands-on Lab: Model Magnetic Field

Lesson 4: Electromagnetism

Hands-on Lab: Build an Electromagnet

MODULE L: WAVES & THEIR APPLICATIONS

Unit 1: Waves

PS4-1, PS4-2

Lesson 1: Introduction to Waves

Hands-on Lab: Model Two Types of Waves

Hands-on Lab: Investigate Waves

Lesson 2: The Behavior of Mechanical Waves

Hands-on Lab: Generate Mechanical Waves

Lesson 3: Light Waves

Hands-on Lab: Model Specific Wave Properties

Lesson 4: The Behavior of Light Waves

Hands-on Lab: Light Up a Maze

Hands-on Lab: Make a Penny Disappear

Unit 2: Information Transfer

PS4-3

Lesson 1: Communication and Waves

Hands-on Lab: Encode a Message

Lesson 2: Analog and Digital Signals

Hands-on Lab: Transmit and Record a Signal

Lesson 3: Communication Technology

Hands-on Lab: Explore How Technology Can Improve Scientific Studies

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