

Grade 4

HMH Into Science™

Family Curriculum Guide

A parent-friendly overview of what your student will explore this year

About HMH Into Science™

HMH Into Science is a research-based, phenomenon-driven science program aligned to the Next Generation Science Standards (NGSS). Rather than simply reading about science, students **do** science — observing real-world phenomena, asking questions, conducting hands-on investigations, and building explanations supported by evidence. Every lesson follows a five-step Sensemaking Journey that keeps curiosity at the center of learning.

■ Phenomenon-Based Learning

Each unit anchors learning in a real, observable phenomenon — a mystery for students to solve through investigation, discussion, and evidence-gathering.

■ Engineering Challenges

Students apply science knowledge to design, test, and refine engineering solutions — building real-world problem-solving skills alongside content knowledge.

■ Three-Dimensional Learning

Every lesson weaves together science practices, core ideas, and crosscutting concepts so students understand the 'why' behind what they observe.

Unit-by-Unit Overview

Unit 1

Engineering and Technology

■ What Students Study:

- Engineering Design: the full Explore → Make & Test → Improve cycle
- Defining problems with clear criteria and constraints
- Generating and comparing multiple design solutions
- Hands-on: Quick Tower Building and Designing a Listening Device

■ Big Ideas & Skills:

- Engineers solve human problems by designing, testing, and improving solutions
- A great solution must meet every criterion AND respect every constraint
- Testing often reveals unexpected failure points — that's how designs get better
- Fair testing (controlling variables) is essential to know if a change really helped
- Communication is part of every phase of engineering, not just the final step

Unit 2

Plant and Animal Structure and Function

■ What Students Study:

- Plant Parts and How They Function (roots, stems, leaves, flowers, seeds)
- Animal Parts and How They Function (external and internal structures)
- How Senses Work — receiving, processing, and responding to information
- Hands-on: Flower Power, Slurp!, Dinner Is Served, Touch Test, No Smell No Taste No See

■ Big Ideas & Skills:

- Every part of a plant or animal has a specific job that supports survival and reproduction
- Internal structures (like bones and organs) work together as systems
- Animals gather information about their environment through specialized sensory structures
- The brain processes sensory signals and directs responses — all in fractions of a second
- Structure and function are always linked — the shape of a part reflects what it does

Unit 3

Energy and Communication

■ What Students Study:

- Energy Transfer and Transformation (heat, sound, light, electrical energy)
- Collisions — how moving objects carry energy and transfer it on impact
- Waves — amplitude, wavelength, and how waves move energy without moving matter
- Information Transfer — from Morse code to digital signals and pixels
- Hands-on: Light the Bulb, Speed and Energy, Let's Make Waves!, Pixels to Pictures

■ Big Ideas & Skills:

- Energy can move from place to place and change from one form to another
- Faster-moving objects carry more energy — speed and mass both matter
- Waves (sound, light, water) transfer energy without permanently moving the material
- Modern communication relies on digitized signals — patterns of 1s and 0s
- The same wave principles that make ocean waves work also carry information in fiber optics

Unit 4

Shaping Landforms

■ What Students Study:

- Factors That Shape Earth's Surface (water, wind, ice, vegetation, gravity)
- Fast and Slow Changes — volcanoes and earthquakes vs. erosion and weathering
- Rock Layers Record Landform Changes — reading Earth's history in stone
- Hands-on: Modeling How Far Sediment Travels, The Rate of Change, Layered Landforms

■ Big Ideas & Skills:

- Earth's surface is constantly being shaped by natural forces operating at very different speeds
- Weathering and erosion slowly break down and move rock and soil over millions of years
- Earthquakes and volcanoes can reshape landscapes dramatically in minutes
- Rock layers preserve a record of past environments — like pages in a history book
- Fossils found in rock layers provide evidence of organisms that lived long ago

■ What Students Study:

- Patterns on Earth — locations of earthquakes, volcanoes, and mountain ranges
- Reducing the Impacts of Natural Hazards — engineering solutions
- Resources — nonrenewable fuels vs. renewable energy sources
- Hands-on: Tracking Quakes, Strong Stable Structures, Modeling Energy Resource Use, Running on Sunshine

■ Big Ideas & Skills:

- Earthquakes and volcanoes occur in predictable patterns linked to plate boundaries
- Understanding those patterns helps scientists forecast hazards and communities prepare
- Engineering can reduce — but rarely eliminate — the damage from natural hazards
- Energy and materials come from Earth's natural resources, but many are limited
- Renewable energy sources (solar, wind, water) offer sustainable alternatives to fossil fuels

Science Skills Your Child Will Build All Year

■ Analyzing Data

Students collect measurements, display them in tables and graphs, and look for patterns that support or challenge their initial predictions.

■ Engineering Thinking

Students move through the full engineering design cycle — exploring, building, testing, and improving — in nearly every unit.

■ Crosscutting Concepts

Students recognize that patterns, cause-and-effect, and systems thinking apply across ALL areas of science — from biology to geology to physics.

How Families Can Support Learning at Home

■ Talk about energy transformations

Cooking, driving, charging a phone — point out everyday moments where energy changes form. Ask your child: 'What kind of energy was that before? What did it become?'

■ Notice Earth's surface together

A riverbank, a hill, a rocky cliff — these are all stories of change over time. Ask your child what force might have shaped what you're looking at.

■ Explore renewable energy in the news

Solar panels and wind turbines are in the news constantly. Ask your child to explain how they work — teaching you is one of the best ways to deepen their own understanding!

