

Full Option Science System™ developed at



THE LAWRENCE  
HALL OF SCIENCE™  
UNIVERSITY OF CALIFORNIA, BERKELEY

*FOSS K-8 Overview*

**For 30 years, one  
curriculum has led  
to this moment  
of discovery.**



# FOSS. Awakening minds like no other science curriculum.

When you make the choice of a science curriculum, you have the right to demand that its promises are backed by an unassailable record of performance. In an era when marketers promote K–8 science curricula “designed for NGSS,” there’s one program field-proven to successfully engage students in true three-dimensional learning: FOSS<sup>®</sup>, the Full Option Science System<sup>™</sup> from UC Berkeley’s Lawrence Hall of Science. FOSS is an acknowledged innovator in the active investigation of scientific phenomena—and the most awarded, most adopted science program in America.



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# FOSS puts students first.

Every student deserves the benefits of science education—not just exposure to scientific phenomena, but the opportunity to understand and explain them. From its foundations, FOSS is built to afford that opportunity to all, regardless of background, culture, language, or ability.

The scholars at the Lawrence Hall of Science designed FOSS around the principle of collaborative, *active investigation*. FOSS effectively engages all students by inviting them to interact with observable phenomena, a teaching philosophy subsequently codified with the arrival of NGSS (Next Generation Science Standards). Some recent programs place the phenomenon at the start of every lesson in a rigid “one size fits all” formula, but FOSS lessons carefully create a level playing field so that all learners have a *logical context* to recognize the phenomenon’s significance as it is introduced. This student-centered approach ultimately honors the spirit of NGSS better by ensuring that all learners can *make sense* of phenomena and solve problems. In this way, FOSS makes science accessible and equitable for every student in every classroom.



**A legacy of success  
in science education.**



**FOSS has earned educators' confidence through decades of classroom-proven results. No other science curriculum comes close to the record of successful implementation amassed by FOSS.**

- FOSS has brought active-science learning to **more classrooms** than any other program.
- FOSS has contributed to the development of **hundreds of thousands** of science graduates, critical thinkers, and scientifically literate citizens over three decades.
- FOSS has provided **more professional learning** to educators than any other science program.
- FOSS has played a significant role in the development of **science education leaders** across the nation.
- FOSS is today's **proven leader** in K–8 science education.

# America's most awarded, most adopted science program.

FOSS has been taught by over 100,000 teachers to more than two million students in all 50 states. Developed and continually refined at UC Berkeley's Lawrence Hall of Science, FOSS is recognized today by experts and organizations across the country for its proven quality, rigor, support and effectiveness.

- **AAP Revere Awards**
  - **Curriculum of the Year**
  - **Best Whole Curriculum—Science**
- **Awards of Excellence Winner: Tech & Learning**
- **STEMWORKS Certified**
- **STEMWORKS @ WestED: FOSS scored 10/10**

**“We started with FOSS First Edition in 1994 and have built highly integrated learning units around science as the driving motivation for student learning. Now FOSS has made that system even more dynamic with its Common Core connections.”**

Mark W.  
*Science TOSA, Washington State*

## **Professional learning no competitor can match.**

FOSS delivers more professional learning to science educators than any other curriculum. FOSS builds strong and lasting partnerships with district science leaders. Moreover, FOSS develops collaborative experiences of professional learning, engaging teachers with effective instructional pedagogies and important science concepts using FOSS classroom materials. By supporting and inspiring teachers, FOSS helps them excite and empower their students.



A close-up photograph of a hand holding a small, yellow, fibrous plant stem. The background is a soft-focus green, suggesting a natural outdoor setting. The text is overlaid on the upper portion of the image.

**“We LOVE the fact that with FOSS, our students get their hands on science concepts rather than just learning about them in texts and by completing worksheets. The real-life application goes beyond the classrooms. The hands-on experiences students get through FOSS raise their interest in science!”**

Courtney S., Learning Strategist  
*Nevada*

**“FOSS already was using the philosophy behind Next Generation Science Standards in earlier editions before they were officially adopted or given explicit terminology. You have the practices, crosscutting concepts, and DCI information in your lessons. You know how to engage kids in learning. Thank you for being ‘the wheel’ before it was reinvented!”**

Erin A., Science Teacher  
*Delaware*

# FOSS & NGSS: We set the standard before there was one.

Over a quarter century before the inception of *A Framework for K–12 Science Education* and NGSS, FOSS was applying research-based practices to engage students as scientists, challenging students to make sense of real-world phenomena as they learned how to solve problems. Today, FOSS embodies the three-dimensional learning the standards were made for—teaching not just rote knowledge, but scientific thinking.

**Science and engineering practices** are the cognitive tools scientists and engineers use to answer questions and design solutions. Using these tools, FOSS students gather evidence to explain real-world phenomena.

**Disciplinary core ideas** are the grade-level appropriate building blocks FOSS students develop throughout their investigations to make sense of their observations and solve problems.

**Crosscutting concepts** tie together the varied concepts and disciplines of science. FOSS students apply them to different situations, making connections and building understanding.



# Active investigation is at the heart of FOSS.

FOSS builds student understanding of core science concepts through active investigation. The FOSS instructional design incorporates these proven pedagogies and practices.

## **Formative Assessment**

monitors student progress on an ongoing basis and drives future instruction.

### **Science Notebooks**

let students organize data and thinking to create a personalized record of learning.

### **Science-Centered Language Development**

blossoms as firsthand investigation inspires students to read, write, and discuss their experiences.

# **Active Investigation**

### **Real-World Applications**

take students outdoors and into the community, connecting problem solving to everyday life.

### **Integrated Technology**

features online activities that let students review and extend their classroom investigation.

### **Reading Informational Text**

encourages students to integrate and extend their active-learning experiences by analyzing text, photos, and diagrams.



## Equipment Kit

Module, course, and grade level kits contain permanent equipment, teacher materials, and consumables for three class uses. Durable, FOSS-exclusive equipment leads to successful investigations for all students, for class sizes up to 32 (8 groups) in repeated use.

## Investigations Guide

This is the core instructional tool that supports the teacher in facilitating student investigations. Chapters include Overview, Framework and NGSS, Materials, Technology, each Investigation, and Assessment. Available in print and digital.

## FOSS Science Resources

FOSS student reading materials are in-depth articles that connect students' firsthand experiences to informational text, helping expand understanding from the concrete to the abstract. Available in print, eBook, and audiobook.

## FOSS Technology

FOSSweb offers simulations and virtual investigations. Online activities provide differentiating instruction. Student ebooks and streaming video are also included. Comprehensive teacher preparation videos and instructional slides support teachers.

## Teacher Resources

Provided in print and available online, resources include grade-level chapters on sense-making and three-dimensional teaching and learning; connections to Common Core ELA and Math standards; taking FOSS outdoors; access and equity in science; science-centered language development; using science notebooks; and notebook, teacher, and assessment masters.

## Spanish Resources

Spanish editions of *FOSS Science Resources* are offered both in print and eBook. FOSSweb provides audio files for *FOSS Science Resources*, as well as notebook, assessment, and teacher masters, module vocabulary and definitions, teaching slides, and Focus Questions.



# The one and only Full Option Science System.

FOSS offers a complete system refined over a quarter century of classroom experience. FOSS-exclusive equipment is proven to work, and all its hands-on, printed and digital learning materials integrate seamlessly. FOSS has sustained the quality of instructional materials through generations of students, evolving continuously to stay abreast of contemporary educational standards and community expectations.

## English Language Arts Connections

FOSS leverages the natural connection between science and language arts. Articles lead students to read and think critically, enhancing their understanding. Students practice ELA skills as well as scientific thinking by organizing their thoughts in a science notebook. Embedded investigation teacher notes provide support for working with English Learners, and specific planning documents for using FOSS for English language development are available.

## Making Sense of Phenomena

In the spirit of NGSS, FOSS lets students step away from their screens and investigate scientific phenomena with their own hands. These explorations introduce them to core ideas, and as they explore, they internalize crosscutting concepts and adopt the practices of scientists and engineers.

## Environmental Literacy

FOSS throws open the classroom door and takes students outdoors to apply scientific principles to natural systems. This raises their awareness of the natural world from the place between manmade buildings to an interdependent host of natural systems on which all life depends, and with repeated visits, builds their desire to understand and embrace it.

## Assessment Tools

Based on the NSF-supported Assessing Science Knowledge (ASK) project, the FOSS Assessment System includes day-to-day embedded assessments, performance assessments of student interactions and discussions, and benchmark assessments of knowledge before and after instruction. Benchmark assessments can be administered in both English and Spanish, and most items are automatically coded when provided in the teacher reports. The FOSS Assessment System fosters a growth mindset and is most powerful when used formatively.

## Digital Components

FOSSweb provides engaging, interactive virtual investigations and tutorials. Tablet-ready FOSS eBooks support English learners and struggling readers. Streaming video takes students “on location.” For teachers, FOSS *eInvestigations Guides*, videos, and instructional teaching slides help prepare lessons and manage assessment.

## Professional Learning

FOSS professional learning experiences can transform the culture of classrooms and foster intellectual risk-taking and collaboration among educators. FOSS can help you build a customized plan for your district, providing experienced consultants to facilitate workshops and developers to provide online assistance, then sustaining the progress of your implementation through ongoing support.

## Standards Alignment

FOSS® Next Generation™ fulfills the vision of NGSS and the Framework. Designed around learning as a developmental progression, it integrates scientific knowledge with the practices of science and engineering. FOSS is aligned closely with NGSS Performance Expectations, and each module includes an explicit list of the core ideas, practices, and crosscutting concepts it will teach.



# The opportunity every child deserves.

When students engage in scientific thinking, they can become the innovative designers, skilled professionals, and informed citizens who change the world for the better. FOSS was designed from its roots to provide that opportunity to every child, regardless of learning style, prior experience, or cultural background. The FOSS philosophy of active investigation and multisensory learning has been refined through 30 years of classroom experience and guided by the Universal Design for Learning (UDL) principles. FOSS teaches all students with pedagogies and procedures found effective for students with special needs and those from culturally and linguistically diverse origins. If you, too, believe that every student can benefit from a solid scientific education and all that comes with it, your students deserve the advantages of FOSS.

# Support that sets the standard for science education.

Delta Education, part of the School Specialty family of brands, is the largest publisher of curriculum-based elementary school science kits in the United States. Together with our partners at the Lawrence Hall of Science, Delta Education is proud to supply FOSS and delighted to support school districts and teachers in ensuring optimum learning for all students.



## Learn more.

Find your local FOSS/Delta Education representative at [DeltaEducation.com/Sales](https://DeltaEducation.com/Sales)

# Join the Next Generation.

## Recommended K–8 Scope and Sequence

### FOSS® Middle School

Grade	Integrated Middle Grades					STEM
8	Heredity & Adaptation* ES, LS	Electromagnetic Force* PS, ES, E	Gravity & Kinetic Energy* PS, E	Waves* PS, E	Planetary Science PS, ES	Variables & Design† Grades 5-8
7	Chemical Interactions PS, ES, E		Earth History PS, ES, LS		Populations and Ecosystems ES, LS, E	
6	Weather and Water PS, ES, E		Diversity of Life LS		Human Systems Interactions LS	

PS: Physical Science content, ES: Earth Science content, LS: Life Science content, E: Engineering content \*Half-length courses

†STEM course can be purchased as a supplement to the FOSS curriculum or purchased separately for STEM electives or extracurricular activities.

### FOSS® K–5

Grade	Physical Science	Earth Science	Life Science	STEM
5	Mixtures & Solutions	Earth & Sun	Living Systems	Sound Design**
4	Energy	Soils, Rocks & Landforms	Environments	
3	Motion & Matter	Water & Climate	Structures of Life	
2	Solids & Liquids	Pebbles, Sand & Silt	Insects & Plants	Forces in Action**
1	Sound & Light	Air & Weather	Plants & Animals	
K	Materials & Motion	Trees & Weather	Animals Two by Two	

\*Coming early 2020

†STEM modules can be purchased as a supplement to the FOSS curriculum or purchased separately for STEM electives or extracurricular activities.



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