



THE LAWRENCE
HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

Lawrence Hall of Science has new instructional materials that address the Next Generation Science Standards!

Check out these Grade 1 Units...

As just one example, compare Grade 1 units from three different Hall programs. See for yourself how each program goes about addressing the Grade 1 NGSS Life Science Standards, and choose the approach that best meets the needs of your school district.

Grade 1 NGSS Performance Expectations

- 1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
- 1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.
- 1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Sample Units from Three Different Hall Programs

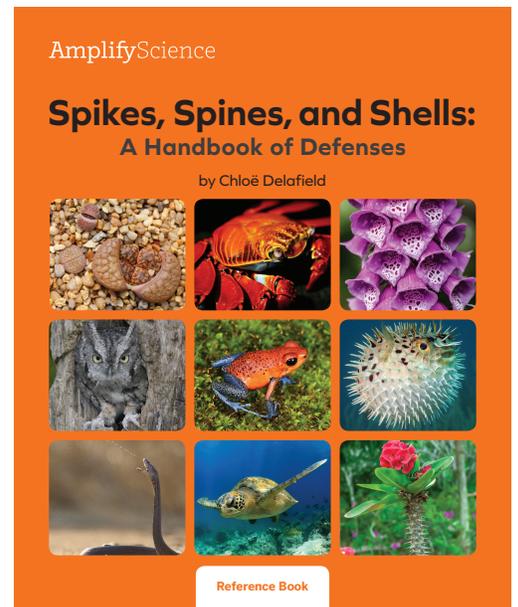
- Amplify Science—*Animal and Plant Defenses: Spikes, Shells, and Camouflage*
- FOSS Next Generation—*Plants and Animals*
- MARE (Marine Activities, Resources, and Education)—*Life at the Seashore*

Description of a Grade 1 unit from Amplify Science

Animal and Plant Defenses: Spikes, Shells, and Camouflage

Grade 1 Unit — requiring at least 22
45-minute class sessions

(one of three Grade 1 Amplify Science units)



The Problem: An aquarium will soon release Spruce, the sea turtle, back into the ocean. The visitors are concerned about how Spruce can survive in the ocean, particularly since sharks live in the area. Further, they wonder if Spruce has offspring, how will the babies survive in the ocean?

Students' Role: Students take on the role of marine biologists, investigating the problem and advising the staff of an aquarium how to explain to their visitors why they shouldn't be concerned about the aquarium's plan to release the sea turtle into the ocean.

What Students Figure Out: In four chapters, students investigate animal and plant defenses, the behavior of both parents and offspring that help offspring survive, and the similarities of plant and animal parents and their offspring. Throughout the unit, students build models of animal and plant defenses to communicate to aquarium visitors that while there are predators in the ocean, sea turtles have structures such as shells and camouflage that can protect them.

How does Spruce the sea turtle do what she needs to do to survive? In Chapter 1, students play a survival game to figure out survival needs of plants and animals. They read a book, observe classmates breathing and eating, and view videos of animals to gather evidence about how specific structures allow living things to meet their needs. They analyze video evidence about sea turtles' structures and survival to explain how Spruce will use specific body structures to get food, water, and air.

How can Spruce the sea turtle survive where there are sharks? In Chapter 2, students investigate three types of defenses: shells, spikes, and camouflage, gathering evidence from video and a reference book, and they create physical models to show how each defense works. Students use what they have learned about animal defenses to explain how Spruce can defend herself against sharks, and they design and build a way to protect the aquarium’s food supply, inspired by animal defenses.

How can Spruce the sea turtle’s offspring survive where there are sharks? In Chapter 3, students observe photos and videos and read about parent animals and plants and their offspring. They gather evidence from videos of young sea turtle offspring and conclude that, unlike some kinds of animals, sea turtles do not protect their young offspring. Spruce’s young offspring will use their structures to defend themselves on their own.

How can aquarium scientists use models to explain animal defenses to the visitors? In Chapter 4, students read a book featuring models and use a Model Checklist to evaluate the models in the book. Each student chooses one of four aquarium animals and creates a model to explain that animal’s defense. They use the checklist to evaluate and improve their own model.

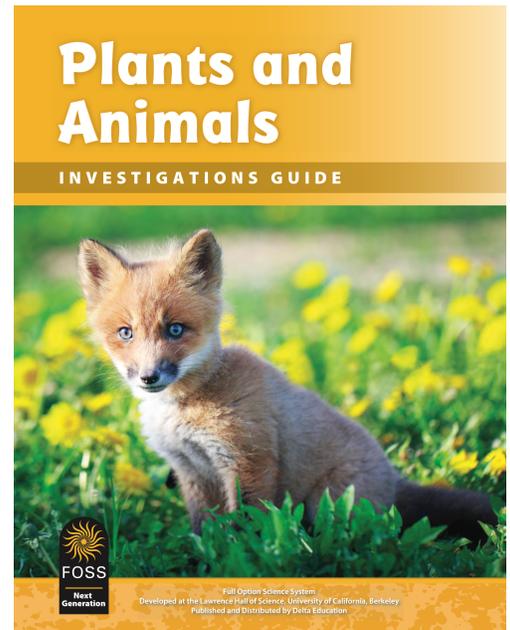
For more about Amplify Science and information about purchasing units from this NGSS–designed K–8 program: <https://www.amplify.com/curriculum/amplifyscience>

Description of a Grade 1 module from FOSS Next Generation

Plants and Animals

Grade 1 Module — requiring at least 30
45-minute class sessions

(One of three FOSS Grade 1 modules)



Guiding question for phenomenon:

How do young plants and animals survive and grow?

This module provides experiences that heighten students' awareness of the ways plants and animals meet their basic needs. Students observe firsthand the phenomenon of new plants propagating from mature plants (from seeds, bulbs, roots, and stem cuttings). They observe and describe changes that occur as growing plants develop, and compare classroom plants to those in the schoolyard. They design terrariums (model habitat systems) and provide for the needs of both plants and animals living together in the classroom.

Students explore variation in the same kind of organism, including variation between young and adults. They learn about the behaviors of parents to help their young (offspring) survive. And they determine structure and function relationships as they analyze different animal and plant structures.

Throughout the *Plants and Animals* Module, students engage in science and engineering practices by collecting and interpreting data to build explanations and designing and using tools to answer questions and solve problems. Students gain experiences that will contribute to the understanding of the crosscutting concepts of patterns; cause and effect; systems and system models; and structure and function.

Investigation 1: Grass and Grain Seeds

Students plant rye grass and alfalfa. They mow their miniature lawns and observe the response of grass and alfalfa to cutting. They plant individual wheat seeds in clear soda straws and observe how grain seeds germinate and grow. They conduct a plant hunt in the schoolyard and continue to look for variation. They use media to look at variation in animals.

Investigation 2: Stems

Students make new plants from the stems of houseplants. They put sections of stems into water and look for evidence that a new plant is forming. Stem pieces that develop roots are planted to make new plants. Students plant pieces of potatoes (modified stems) and observe them grow, and study how people use plants for food.

Investigation 3: Terrariums

Students set up terrariums using seeds and plants from Investigations 1 and 2. They add local animals such as snails, isopods, and worms and provide for the needs of the plants and animals. Students obtain information about other animals and plants and focus on their structures and behaviors that help them survive. Students use media to learn about how engineers learn from nature to solve human problems.

Investigation 4: Growth and Change

Students plant onion bulbs or garlic cloves in moist cotton and observe as they develop into new plants. They plant parts of roots—carrots and radishes—to discover which parts will develop into new plants. Students adopt schoolyard plants and compare them to the classroom plants. They use media to compare young animals to their parents and observe the parent behaviors that help young animals to survive.

For more about FOSS Next Generation and information about purchasing units from this NGSS-aligned K–8 program:

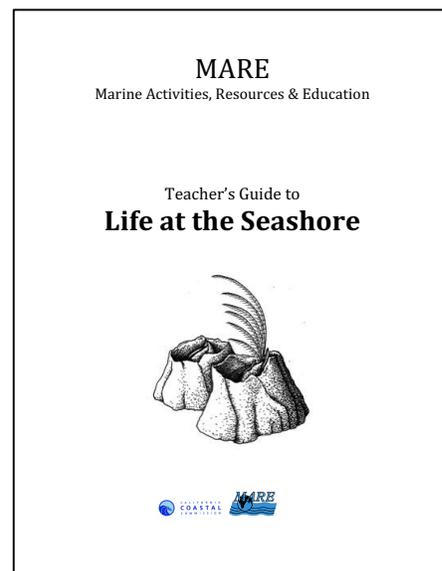
<https://www.deltaeducation.com/foss/how-foss-works>

Description of a Grade 1 unit from MARE (Marine Activities, Resources, and Education)

Life at the Seashore

Grade 1 Unit — requiring at least 25 45-minute class sessions

(One of one Grade 1 MARE units)



Students examine how living things survive at the seashore. Students take a look at what kind of place the seashore is and make observations on the kinds of structures organisms have that help them survive there, including structures that help them move, feed, and protect themselves. They deepen their understanding of how a group of animals called Crustaceans survive and find food at the seashore, with investigations of a crayfish. As they build a 3-dimensional seashore in their classroom, students research and present explanations for where on the seashore their organism could survive and grow.

Investigation 1: Seashore Charades

Students discuss what they would need and what they might expect to see on a field trip to the seashore, then embark on a virtual field trip. They learn what kind of place the seashore is and observe important conditions such as waves and changing tides. Students think about and discuss, with some input from the teacher, what an organism living there would need and how it might behave to survive. They communicate this new information through charades that demonstrate body structures and behaviors used by seashore organisms. Students learn and demonstrate their understanding that these structures are related to their function.

Investigation 2: Crayfish Capers

To build their understanding of how living things survive at the seashore, students observe and investigate an Arthropod crustacean: a crayfish. Most crustaceans live in the ocean; but crayfish live in freshwater. Students observe the external body parts of the crayfish and ask questions about how these organisms sense their environment. The students design and conduct an investigation to answer a question about how crayfish find and sense their food. Students write and make labeled drawings to communicate what they have learned about crayfish.

Investigation 3: Build a Seashore

Most seashores in the world have bands, or zones, formed by the tides. Students notice patterns, like recognizing neighborhoods, and make explanations of where on the seashore organisms survive, using their body structures and behaviors as evidence. They build a three-dimensional seashore in their classroom, to better understand the distribution of the organisms living there and create a Field Trip Guide to share their understanding.

Investigation 4: Tidepool Boogie

Students consider the Banana Slug String Band song “Tidepool Boogie,” then work together to act out the adaptations of organisms featured in the song. The class then stages a performance, complete with costumes.

For more about MARE and information about downloading this and one other NGSS-designed unit:

<http://mare.lawrencehallofscience.org/curriculum/teacher-guide>