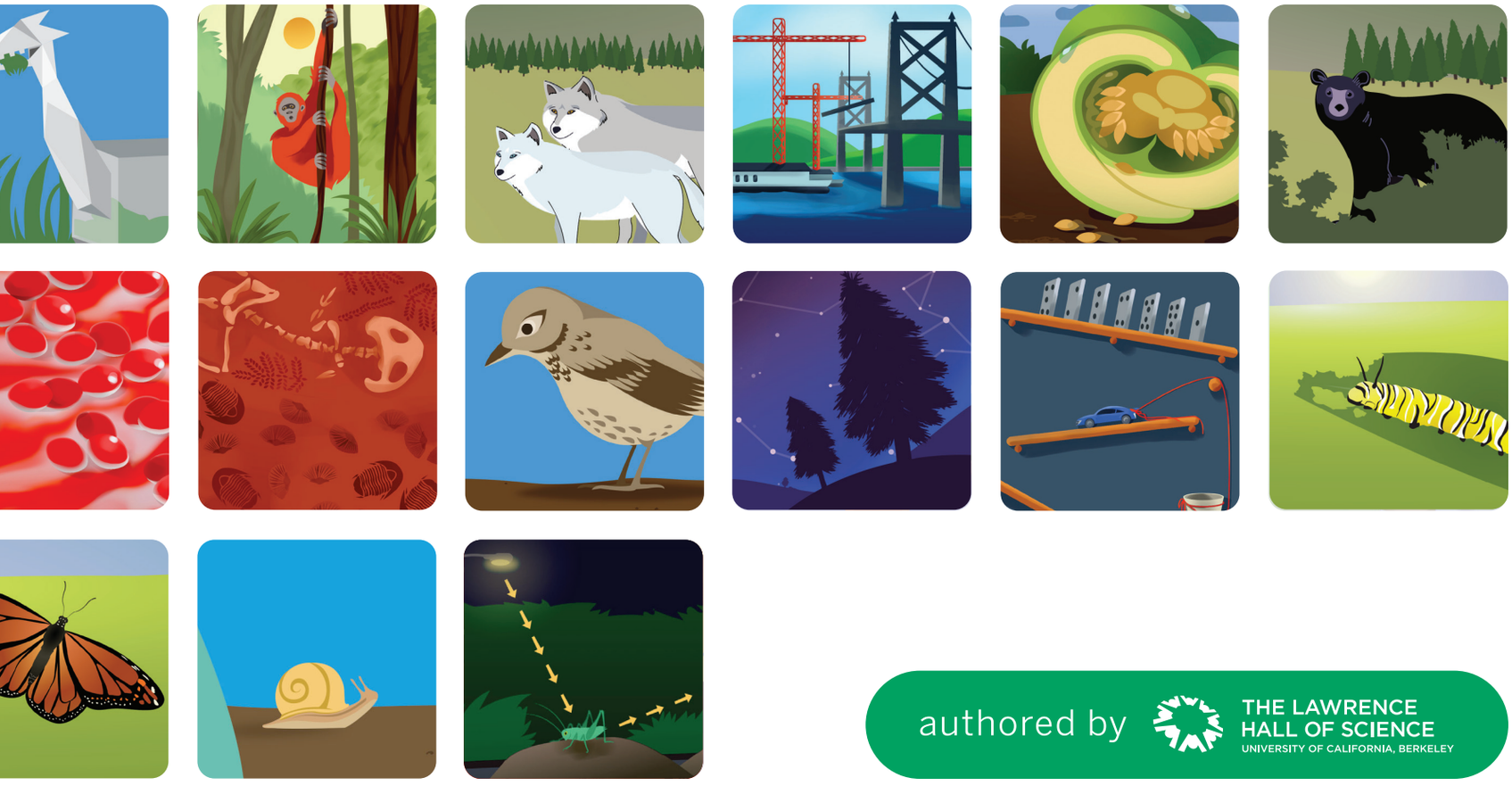
Amplify Science

Grade K

Planning guide



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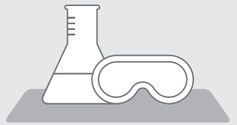
Program components

Student

Hands-on



Kit materials

Reading

Student Books for read-alouds, shared reading, and partner reading

Writing

Student Investigation Notebooks

Teacher

Instruction

Print Teacher's Guide

Digital Teacher's Guide

Display and hands-on materials (vocabulary cards, unit questions, key concepts, sorting cards, and more)

Planning for a year

Kindergarten scope and sequence

(66 days of instruction)

Needs of Plants and Animals

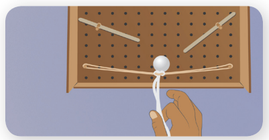
20 45-minute lessons
2 dedicated assessment days

Focal NGSS Performance Expectations:

- K-LS1-1
- K-ESS2-2
- K-ESS3-1
- K-ESS3-3

Focal Disciplinary Core Ideas:

- LS1.C
- ESS2.E
- ESS3.A
- ESS3.C



Pushes and Pulls

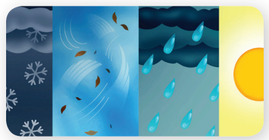
20 45-minute lessons
2 dedicated assessment days

Focal NGSS Performance Expectations:

- K-PS2-1
- K-PS2-2
- K-2-ETS1-1
- K-2-ETS1-2
- K-2-ETS1-3

Focal Disciplinary Core Ideas:

- PS2.A
- PS2.B
- PS3.C
- ETS1.A
- ETS1.B
- ETS1.C



Sunlight and Weather

20 45-minute lessons
2 dedicated assessment days

Focal NGSS Performance Expectations:

- K-PS3-1
- K-PS3-2
- K-ESS2-1
- K-ESS3-2

Focal Disciplinary Core Ideas:

- PS3.B
- ESS2.D
- ESS3.B

Amplify Science was built from the ground up for three-dimensional learning. Access the Teacher's Guide to see the complete list of Disciplinary Core Ideas, Crosscutting Concepts, and Science and Engineering Practices addressed in each unit.

Scheduling options

No matter what your scheduling preference, Amplify Science will work in your classroom.

"I teach science two times a week."

Each Amplify Science unit at Grade K is made up of 22 45-minute lessons, which includes two lessons for pre- and post-assessment. With two scheduled 45-minute sessions each week, each Amplify Science unit will take between 2 and 2.5 months to complete.

"I teach science three times a week."

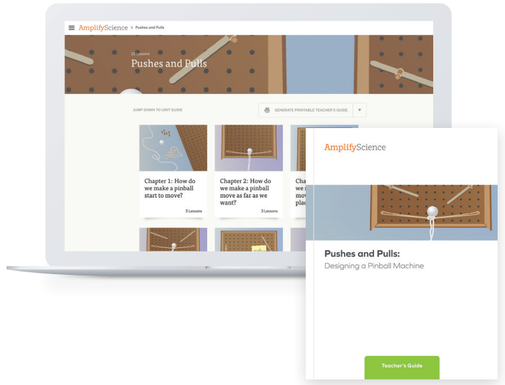
The easiest option is to plan for three 45-minute sessions each week. This way, each Amplify Science unit will take approximately 1.5 months. This plan will provide you the freedom to slow down the pace of instruction if your students need more time, or if you'd like to weave in additional experiences.

"I teach science every day."

It will take you approximately 5 weeks (22 school days) to complete each unit. If you plan for sessions shorter than 45 minutes, the units will take slightly longer to complete.

Planning for a unit

Each unit's Teacher's Guide has all the information you need to learn about that unit's content and structure, materials, storyline, and student learning objectives.



Planning Options

1 hour per unit

If you want to thoroughly prepare for a unit, the most important resources to locate and read are:

Foundational:

- **Unit Overview:** a few paragraphs outlining the unit, including what the unit is about, why it was written this particular way, and how students experience the unit.
- **Unit Map:** A 1-page summary showing how the chapters build upon each other, what questions students will investigate, and what evidence sources they will use to figure those questions out.
- **Lesson Overview Compilation:** 1–2 pages on each lesson provide insight into each lesson's sequence of activities, intent, materials used, and how the lessons connect with and build upon each other.

Supporting:

- **Progress Build:** A thorough explanation of the unit's learning progression (called the "Progress Build"). Understanding and internalizing the Progress Build is key to understanding the embedded unit assessments.
- **Science Background:** A teacher-facing document that gives valuable science content information and calls out common student misconceptions and preconceptions. The Science Background resource provides all the context and subject matter knowledge needed to teach the unit.

30 minutes per unit

If you're a bit strapped for time but still want to get the essentials, try to focus on:

- **Unit Overview**, 1 page
- **Unit Map**, 1 page
- **Lesson Overview Compilation**

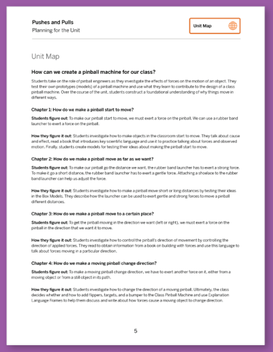
5 minutes per unit

If you have only 5 minutes to familiarize yourself with the most essential aspects of the unit, skip right to the **Unit Overview** and **Unit Map**. At the very least you'll understand the unit narrative, structure, and a sense of the materials used.

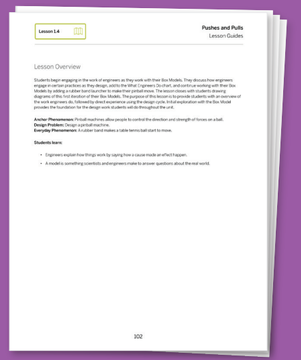
NOTE

There's much more information available in the Teacher's Guide, including overviews of the unit's assessments, readings, student-facing technology, and standards.

Unit Overview
1 page



Unit Map
1 page



Lesson Overview Compilation
Read through the lesson overviews in Chapter 1 - ***1 page each***

Progress Build
1 page

Science Background
Between 3 and 9 pages

Planning for a unit

Investigation focus

In the *Needs of Plants and Animals: Milkweed and Monarchs* unit, students figure out that monarch caterpillars feed on milkweed plants, and then investigate what milkweed plants need to grow by observing and recording plants under different water and light conditions.

Student role and phenomena

Students assume the role of scientists helping a group of children from the fictional community of Mariposa Grove to explain why there are no more caterpillars in a community garden that was converted from a field which once had caterpillars; students also advise the children on what they can do to attract the monarchs.

Insights

Books and time-lapse videos provide more opportunities for students to learn how plants get what they need to grow. Students also examine the ways that humans change their environment in order to meet their needs and explore how people can choose to share the places they live with other living things.

Engineering design focus

In the *Pushes and Pulls: Designing a Pinball Machine* unit, students conduct tests on their own prototypes of a pinball machine (called Box Models) and use what they learn to solve the design problem of creating a Class Pinball Machine.

Student role and phenomena

In this unit, students will take on the role of pinball engineers to explore how pinball machines allow people to control the direction and strength of forces on a ball.

Insights

Regular circle-time discussions facilitate students' growing understanding of ideas related to force and motion, as well as their ability to use language to describe these fundamental ideas. In the process, students learn about how engineers design and test solutions to problems.

Modeling focus

The *Sunlight and Weather: Solving Playground Problems* unit provides the foundation for understanding the mechanism underlying all weather—how the sun warms Earth's surface.

Student role and phenomena

In their role as weather scientists, students solve the problem of why students at one fictional school are too cold during morning recess while students at another school are too hot during afternoon recess.

Insights

Through hands-on investigations and the use of physical models, students explore the warming effect of sunlight, and figure out how to solve the schools' problems. Students extend their understanding of weather with an exploration of severe weather within the context of the schools.

Planning for a lesson

Amplify Science makes lesson prep as easy as 1, 2, 3. You can use either the printed or digital Teacher's Guide.

1

Read the 1 page **Lesson Overview**, which contains:

- A **1-paragraph summary of the lesson**, including insights into the lesson's activities and any materials used.
- Clearly labeled **phenomena**.
- **Student learning objectives**
- **Lesson at a Glance**, which provides an outline of the lesson along with pacing suggestions.

Have some extra time? Read through the full step-by-step instructions for the lesson to see exactly where different materials are used, where projections are shown, and where to insert recommended teacher talk moments.

2

Every lesson includes a **Materials and Preparation** section, which clearly identifies all of the hands-on manipulatives, Student Books, printed classroom wall materials, and digital tools needed for the lesson. Remember: every lesson is different! Some lessons might call for Student Books; other lessons might call for setting up stations for hands-on investigations. Be sure to glance at the Materials and Preparation section to see what you need for your specific lesson.

3

Download any **Digital Resources** needed for the lesson. For example, most lessons have projections that you can show to your students at specific parts in the lesson. Be sure to download the PDF of projections before class.

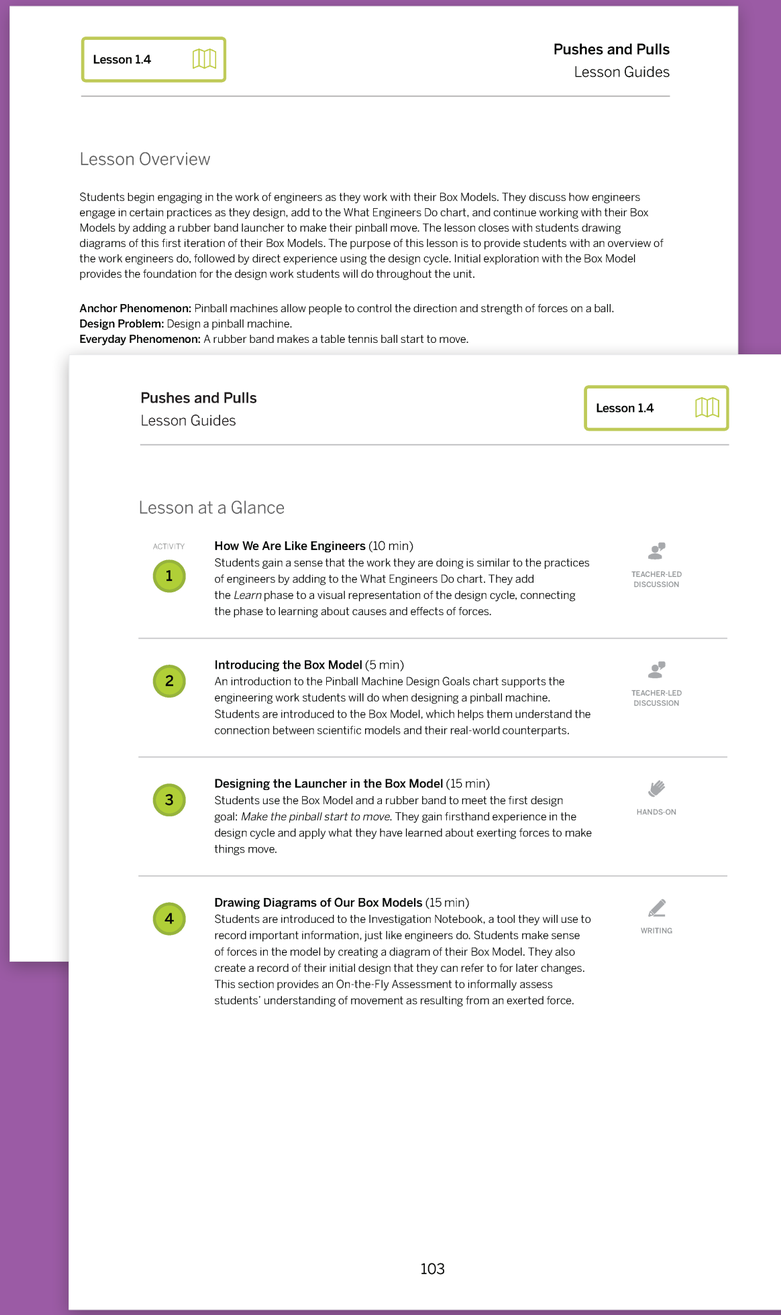
TIP

Did you know that you can download all digital resources you'll need in the unit with just a few clicks? Look for the **Offline Guide** in your digital Teacher's Guide to download all projections, assessments, videos, and more.

Offline Preparation

Teaching without reliable classroom internet? Prepare unit and lesson materials for offline access.

OFFLINE GUIDE



Lesson 1.4

Pushes and Pulls
Lesson Guides

Lesson Overview

Students begin engaging in the work of engineers as they work with their Box Models. They discuss how engineers engage in certain practices as they design, add to the What Engineers Do chart, and continue working with their Box Models by adding a rubber band launcher to make their pinball move. The lesson closes with students drawing diagrams of this first iteration of their Box Models. The purpose of this lesson is to provide students with an overview of the work engineers do, followed by direct experience using the design cycle. Initial exploration with the Box Model provides the foundation for the design work students will do throughout the unit.

Anchor Phenomenon: Pinball machines allow people to control the direction and strength of forces on a ball.
Design Problem: Design a pinball machine.
Everyday Phenomenon: A rubber band makes a table tennis ball start to move.

Pushes and Pulls
Lesson Guides

Lesson 1.4

Lesson at a Glance

ACTIVITY

1 **How We Are Like Engineers** (10 min)
Students gain a sense that the work they are doing is similar to the practices of engineers by adding to the What Engineers Do chart. They add the *Learn* phase to a visual representation of the design cycle, connecting the phase to learning about causes and effects of forces.
TEACHER-LED DISCUSSION

2 **Introducing the Box Model** (5 min)
An introduction to the Pinball Machine Design Goals chart supports the engineering work students will do when designing a pinball machine. Students are introduced to the Box Model, which helps them understand the connection between scientific models and their real-world counterparts.
TEACHER-LED DISCUSSION

3 **Designing the Launcher in the Box Model** (15 min)
Students use the Box Model and a rubber band to meet the first design goal: *Make the pinball start to move.* They gain firsthand experience in the design cycle and apply what they have learned about exerting forces to make things move.
HANDS-ON

4 **Drawing Diagrams of Our Box Models** (15 min)
Students are introduced to the Investigation Notebook, a tool they will use to record important information, just like engineers do. Students make sense of forces in the model by creating a diagram of their Box Model. They also create a record of their initial design that they can refer to for later changes. This section provides an On-the-Fly Assessment to informally assess students' understanding of movement as resulting from an exerted force.
WRITING

For more information on Amplify Science, visit **amplify.com/science**.







Amplify.

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