



Hands-on investigation

Hands-on learning is an essential part of Amplify Science, and is integrated into every unit. Students actively participate in science, acting like scientists and engineers as they gather evidence, think critically, solve problems, and develop and defend claims about the world around them. Every unit includes hands-on investigations which are critical to achieving the unit's learning goals.

This brochure will walk you through example activities from each of our kindergarten units.



Hands-on Flextions

Hands-on Flextions are additional, optional investigations that are included at logical points in the learning progression and give students an opportunity to dig deeper if time permits. These activities offer teachers flexibility to choose to dedicate more time to hands-on learning. These activities will be designated as *FLEX* in this brochure.

Materials referenced in Hands-on Flextion activities will either be included in the unit kit or easily sourced. Supporting resources such as student sheets will be included as downloadable PDF files.

All hands-on investigations included in the program are developed by UC Berkeley's Lawrence Hall of Science.

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Quantity and materials in each kit are subject to change. For current lists of all materials in each kit, please visit amplify.com/science.

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KINDERGARTEN

Needs of Plants and Animals

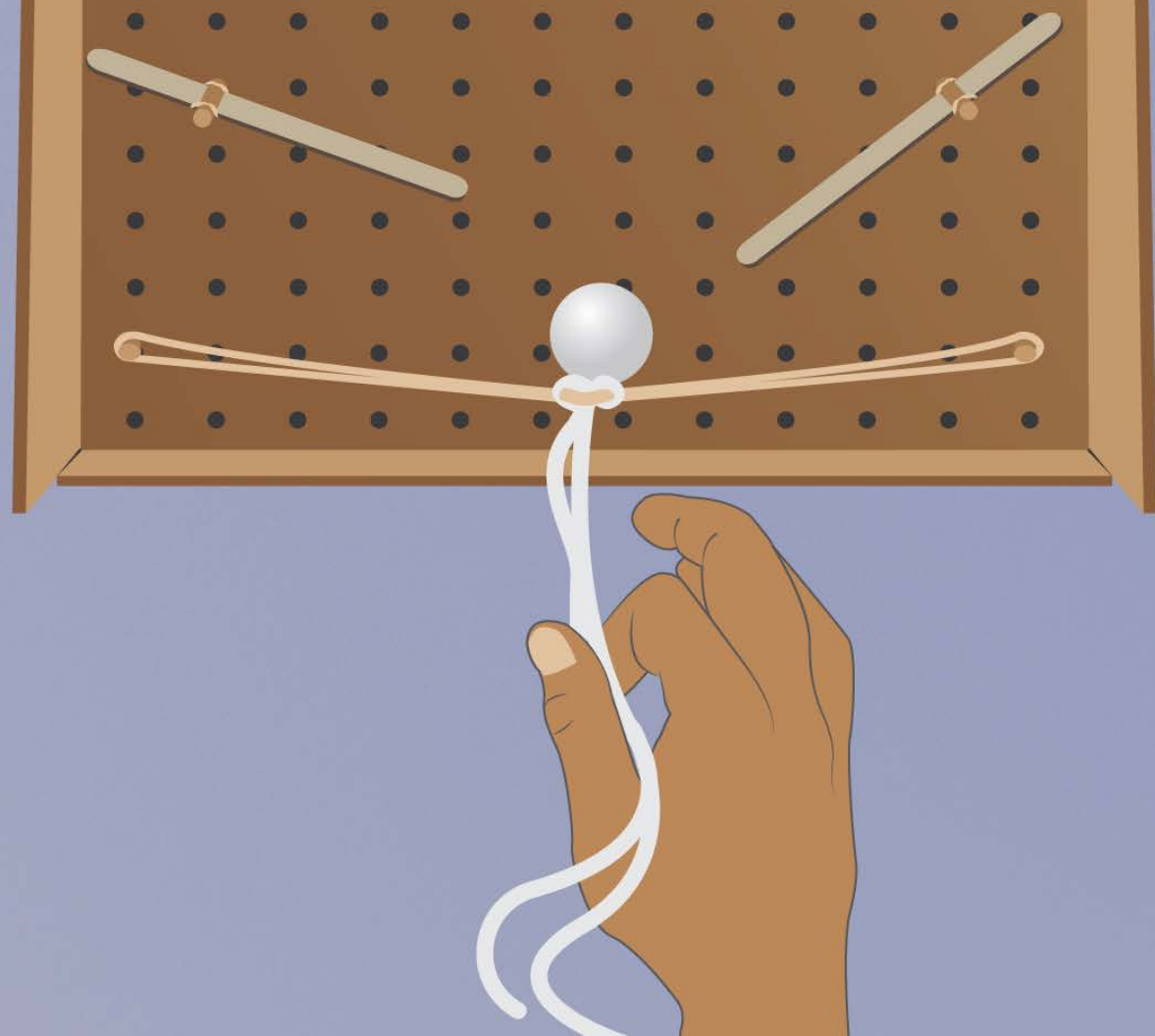
Unit storyline

Students take on the role of scientist in order to figure out why there are no longer any monarch caterpillars living in an area that was converted from a field to a community garden. Students investigate how plants and animals get what they need to live and grow, and then make a new plan for the community garden that will provide for the needs of monarch caterpillars as well as produce vegetables for humans.

Featured activity: Observing Radish Roots (Lesson 2.6)

In Chapter 2 of *Needs of Plants and Animals*, students investigate what it means for a plant to grow, whether or not all plants need water to grow, and how plants get the water they need to grow. Students plant radish seeds in soil, providing water to half of the plants while the other half receive no water. Students observe the radish plants over time and figure out that only the plants that receive water are growing. The plant observations also provide students with evidence that the plants that are growing get the water they need with their roots from the soil.





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Pushes and Pulls

Unit storyline

Students take on the role of pinball engineer as they investigate the effects of pushes and pulls on the motion of an object. They make and test their own models of a pinball machine, and use what they learn to contribute to the design of a class pinball machine. Throughout the unit, students learn about the design cycle and how engineers continually test their designs to improve their solutions.

Featured activity: Showcasing the Box Models (Lesson 5.3)

In Lesson 5.2 of *Pushes and Pulls*, students synthesize what they have figured out about force and motion to create a culminating design for their pinball machine models. Students incorporate a launcher, flippers, and bumpers into their model to help their pinball reach a target. Students then test their models to observe whether or not their solutions work as expected, and then make any additional modifications as necessary.





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Sunlight and Weather

Unit storyline

The students at Carver and Woodland Elementary schools are not comfortable outside during their recess times. The Carver students are too cold in the morning and the Woodland students are too hot in the afternoon. In their roles as weather scientists, students help explain the difference in playground temperatures. They gather data from models of the sun and Earth's surface to figure out how sunlight causes changes in the temperature of different surfaces. At the end of the unit, students apply what they have learned and use models to solve a new problem about why Woodland's playground sometimes floods.



Featured activity:

Investigating with the Flooding Model (Lesson 5.2)

In Lesson 5.2 of *Sunlight and Weather*, students are introduced to four flooding models, each of which tests whether a particular difference between the playgrounds causes flooding — gravel or solid playground surface, dark or pale playground surface, trash cans with covers or no covers, and fountain or no fountain. Students analyze how the models are like and unlike the playgrounds and make predictions about what they will observe when they test them. They drip water on their models to simulate rain and observe and record the resulting water levels in the models. This activity allows students to use models to gather data to help determine whether any of the differences between the playgrounds are responsible for Woodland's playground flooding while Carver's does not.