AmplifyScience

Kindergarten Hands-on activities

authored by THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

Hands-on investigation

Hands-on learning is at the heart of Amplify Science, and is integrated into every unit. Each hands-on activity provides clear instructions for the teacher, while providing easily accessible materials in unit-specific kits.

With Amplify Science, students actively participate in science, acting like scientists and engineers as they gather evidence, think critically, solve problems, and communicate their claims.

This document will walk you through an overview of the materials provided for an entire unit, and then focus on one particular activity in that unit to give you a sense of the role hands-on investigation plays in the instruction.

Table of contents

Kindergarten

Needs of Plants and Animals

Students take on the role of scientists in order to figure out why there are no monarch caterpillars in a community garden since vegetables were planted. In so doing, they investigate how plants and animals get what they need to live and grow, and make a new plan for the community garden that provides for the needs of the monarch caterpillars in addition to vegetables for humans.

Materials in this unit

Quantity	Description
50	cups, 2 ounce, plastic
250	cups, 9 ounce, plastic*
1	clamp lamp
1	grow light bulb
1	light timer
2	Nutrient Rich Soil coupons
4	plant misters
2	radish seeds, packets*
100	sticky notes, black*
5	sticky notes, electric blue, pads*
6	sunflower seeds, packets*
5	trays, potting, plastic
1	bowl, mixing, large Δ
9	clipboards or notebooks Δ
1	garlic bulbs, intact* Δ
74	garlic cloves* Δ
18	glue sticks Δ
7	index cards, 3" x 5" Δ
1	marker, black Δ
1	marker, blue Δ
1	paper, chart, pad* Δ
1	pitcher, or large bottle of water Δ
2	pocket charts Δ
100	sentence strips Δ
1	sharp scissors Δ
1	spoon, large Δ
36	sticky notes* □ Δ
1	tape, masking, roll* □ Δ

*** consumable item**
□ included in starter kit
Δ items provided by the teacher

Elementary School Starter Kit

Amplify Science also offers a starter kit for purchase, which includes general science materials needed to conduct most hands-on activities for all units in the curriculum. Starter kit items can fulfill some teacher-provided materials needed for each unit.

Example activity

Investigating Whether Plants Need Water

In Lesson 2.3 of *Needs of Plants and Animals*, students set up an investigation to figure out if plants need water to grow. They place one garlic clove in a cup with water and one garlic clove in a cup with no water. They record initial observations in their Investigation Notebooks. Then, they return to the investigation a few days later, and notice how the garlic has changed as a function of whether or not the cloves have been given water. They record these observations and compare the records of their first and second observations to identify evidence of growth. Students use what they have learned from the this activity to make predictions about what radish seeds need to grow and set up the next activity.

Example activity materials

For the classroom wall

- **What Scientists Do chart**

For the class

- **1 set of Do Plants Need Water Investigation materials (from Lesson 1.7):**

  1 intact garlic bulb Δ

  2 garlic cloves Δ

  4 clear plastic cups, 9 oz.

  pitcher (or large bottle) of water Δ

Δ **items provided by the teacher**

Unit print materials

Each unit's kit includes print materials for the classroom:

- **Chapter Questions**
- **Key Concepts**
- **Vocabulary**
- **Unit Questions**
- **18 copies of each student book:**

  Science Walk

  Above and Below

  Handbook of Plants

  A Plant in the Desert

  Investigating Monarchs

Pushes and Pulls

Students take on the role of pinball machine engineers as they explore the effects of pushes and pulls on the motion of an object. They conduct tests in their own prototypes (models) of a pinball machine, in order to contribute to to the design of a class pinball machine.

Materials in this unit

Quantity	Description
93	bags, plastic*
1	ball, form, 6”
73	balls, table tennis*
73	binder clips, large*
1	cardboard box, classroom size, 12” x 24” x 2”
73	cardboard boxes, student size, 11” x 17” x 2”, with slots*
16	dowels, 2” long
18	marbles, flat
2	masking tape, rolls*
18	nuts, large, metal
1	peg board
81	rubber bands, large*
160	rubber bands, medium*
24	rubber bands, small*
74	shoelaces*
21	tennis balls
200	tongue depressors, jumbo*
18	cardboard tube (optional) Δ
18	clothespins (optional) Δ
18	cotton balls (optional) Δ
36	crayons, black Δ
36	crayons, blue Δ
36	crayons, brown Δ
36	crayons, orange Δ
36	crayons, red Δ
39	cubes, small, interlocking Δ
18	dice (optional) Δ
18	erasers (optional) Δ
10	magnets, whiteboard (optional) Δ
1	marker, wide tip,black Δ
1	marker, wide tip, blue Δ
1	marker, wide tip, brown Δ
1	marker, wide tip, orange Δ
1	marker, wide tip, red Δ
18	math manipulative (interlocking cubes, counting bears, blocks) Δ
18	paper, any size, crumpled into a ball (optional)* Δ
1	paper, chart, pad* Δ
57	paper, sheets, regular or construction, 8.5” x 11” Δ
1	paper clips, box* Δ
18	paper towel or tissue, sheets* Δ
18	pipe cleaners, any color Δ
100	sentence strips Δ
1	sticky notes, pad, 3” x 3”* □ Δ
1	whiteboard or pocket chart □
18	wooden blocks (optional) □

*** consumable item**
□ included in starter kit
Δ items provided by the teacher

Example activity

Testing and Improving a Pinball Machine

In Lesson 5.2 of *Pushes and Pulls*, students continue to learn about the design cycle, specifically how engineers use testing to make their solutions even better. They apply this idea as they make final changes to their models, testing their solutions to see if the model works as expected and making changes as necessary. The lesson later closes with students beginning to write a mini-book about how their model works.

Example activity materials

For the classroom wall

- Pinball Machine Design Goals chart

For the class

- demonstration model
- demonstration model materials bag
- Pinball Machine Design Goals Checklist copymaster

For each student

- model (with materials from previous lesson still attached)
- model materials bag
- Pinball Machine Design Goals Checklist student sheet
- 1 sticky note, 3" x 3" Δ

Δ items provided by the teacher

Unit print materials

Each unit's kit includes print materials for the classroom:

- Chapter Questions
- Key Concepts
- Vocabulary
- Unit Questions
- 18 copies of each student book:

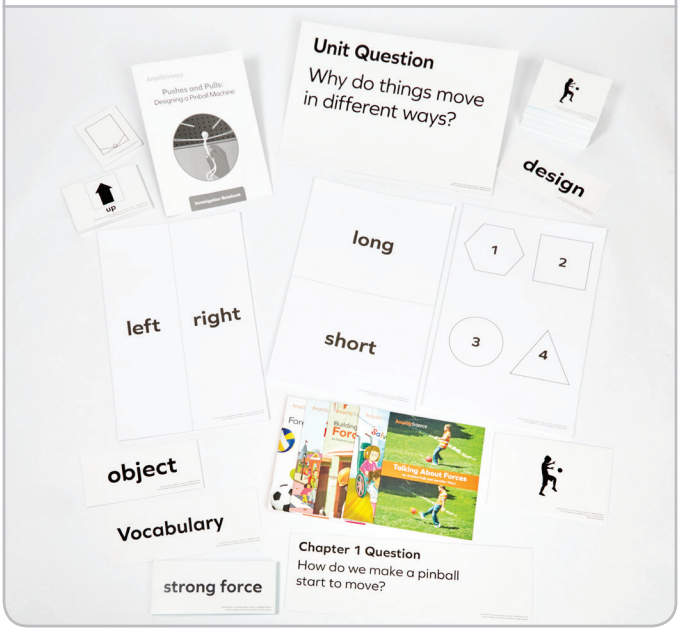
  Talking About Forces

  Building with Forces

  Forces in Ball Games

  A Busy Day in Pushville

  Room 4 Solves a Problem



Sunlight and Weather

In their role as weather scientists, students investigate why one fictional schoolyard is too cold in the morning, while another, which is nearby, is too hot in the afternoon. They conduct investigations using physical models to figure out the impact of sunlight on Earth's surface.

Materials in this unit

Quantity	Description
4	caps, water bottle, small
9	clamp lamps
1	clay, soft plasticine, 1 pound
8	containers with lids, plastic, ½ ounce
90	cups, clear plastic, 10 ounce
37	cups, paper
1	glue, super, bottle
2	gravel, cups
9	lightbulbs, 60 Watt, clear
12	rubber sheets, black, packages of 54 pieces
6	rubber sheets, white, packages of 54 pieces
18	thermometers
1	black marker, wide-tip Δ
1	clipboard Δ
1	construction paper, black, 8 1/2" x 11"* Δ
18	construction paper, white, 11" x 17"* Δ
18	crayons, sets: red, orange, yellow, green, blue, purple Δ
1	extension cord (optional) Δ
–	ice* (enough to chill 18 plastic cups of water) Δ
12	index cards, white, 4" x 6"* Δ
1	markers, set: red, orange, yellow, green, blue, purple Δ
20	paper, chart* Δ
1	paper cutter or scissors Δ
1	paper, scratch* Δ
37	paper, white, 8.5" x 11"* Δ
36	pencils Δ
1	pitcher, large Δ
1	ruler, 12-inch Δ
15	sentence strips Δ
1	tape, masking, rolls* □ Δ
1	timing device (e.g., wall clock, cell phone, stop watch) Δ
18	trays, plastic □ Δ
2	Water, gallons* Δ
1	Xacto knife or other sharp instrument Δ
1	pocket chart Δ

*** consumable item**
□ included in starter kit
Δ items provided by the teacher

Example activity

Gathering data from the Colored Surfaces Model

In Lesson 4.1 of *Sunlight and Weather*, students have hypothesized that dark surfaces may get warmer than pale surfaces when sunlight shines on them for the same amount of time. Students use a physical model in which a lamp represents the Sun, and dark — and light — colored rubber represent dark and light parts of Earth's surface. They collect data to test their ideas.

Example activity materials

For the class

- What Scientists Do chart

For each group of four students

- 1 clamp-on lamp
- 1 light bulb, 60 watt
- 2 pieces of black rubber, 3" x 6"
- 2 pieces of white rubber, 3" x 6"

For each pair of students

- 1 thermometer with colored strips attached
- 1 set of crayons: purple, blue, green, yellow, orange, red Δ

For each student

- *Sunlight and Weather* Investigation Notebook (pages 8–9)

Δ items provided by the teacher

Unit print materials

Each unit's kit includes print materials for the classroom:

- **Chapter Questions**
- **Key Concepts**
- **Vocabulary**
- **Unit Questions**
- **18 copies of each student book:**

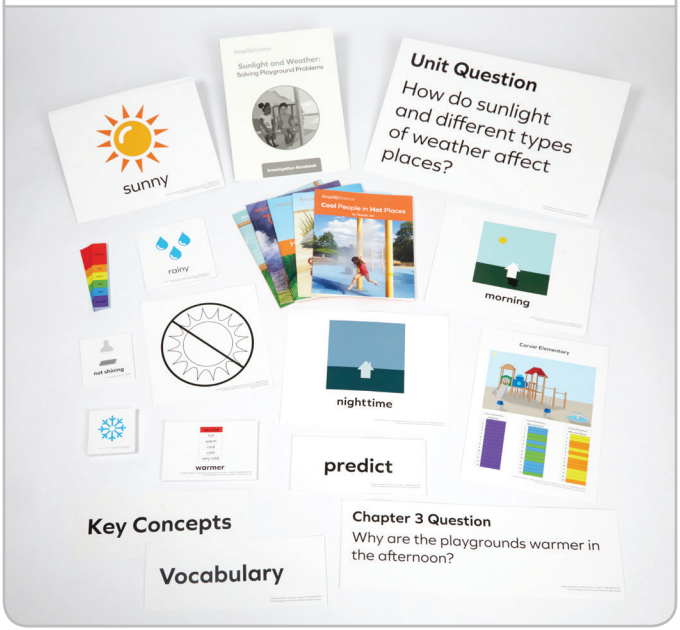
Handbook of Models

Cool People in Hot Places

Getting Warm in the Sunlight

What is the Weather Like Today?

Tornado! Predicting Severe Weather



Go to **amplify.com/sciencek5**
for a list of all materials in each kit.

Amplify.

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY