AmplifyScience

Grade 3 Hands-on activities

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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.

Quantity and materials in each kit are subject to change. For current lists of all materials in each kit, please visit **amplify.com/sciencek5**.

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Table of contents

Grade 3

Balancing Forces

In their role as consulting scientists, students are challenged to figure out how a floating train works in order to explain it to the citizens of the fictional city of Faraday. They apply ideas about non-touching forces as well as balanced and unbalanced forces.

Materials in this unit

Quantity	Description
1	aluminum foil, roll*
38	bags, plastic, gallon, freezer, self-sealing*
20	bags, plastic, quart, self-sealing*
18	balls, rubber, small
3	balloons, medium size, packs (12/pack)
2	battery, D-volt*
38	blocks, wooden
1	bolt, iron
20	cardboard, sheets, 8.5" x 11"*
1	clothespins, wood, with wire hinges, pack (24/pack)
18	cups, plastic, 16 oz.
19	dominoes, plastic, small
1	fasteners (brads), brass plated, box (30/box)
10	fasteners (brads), solid brass
40	hooks, with pointed screw tips
1	index cards, 3" x 5", pack (100/pack)*
1	magnets, ball, pack (20/pack)
19	magnets, ring, boxes (2/box, one magnet with red side)
2	paper clips, small, packs (100/pack)
1	sandpaper, small piece*
10	spoons, steel
16	steel wool, pieces
15	sticks, craft, wooden
1	string, cotton, white, ball, 105 feet
20	twist ties, iron cores
10	washers, metal
1	wire, magnet, copper, roll
36	books, heavy, or other 1-lb. objects Δ
9	cardboard tubes (toilet-paper rolls), 4" long Δ
1	hole punch, single Δ
1	marker, black Δ
7	paper, chart, sheets* Δ
18	pencils Δ
10	pennies Δ
20	rubber bands, thick, medium size Δ
18	rulers Δ
1	scissor Δ
5	sentence strips* Δ
10	spoons, plastic Δ
1	stapler Δ
1	sticky notes, yellow, 3" x 3", pack (12 pads/pack)* □ Δ
1	tape, clear, roll* □ Δ
2	tape, masking, rolls* □ 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

Floating Paper Clip Challenge

In Lesson 3.2 of *Balancing Forces*, students continue to explore and collect evidence of multiple forces, including gravitational force and magnetic force, acting on a single object. They construct a device, the Floating Paper Clip Device, in which multiple forces act on a paper clip, causing the paper clip to float. Later, students gather more evidence about multiple forces on an object by reading, in *Handbook of Forces*, about balanced and unbalanced forces. This text provides more examples of balanced forces and helps students conceptualize evidence of this happening.

Example activity materials

For the class

- large pieces of cardboard (7''x 3.5'')
- small pieces of cardboard (3.5'' x 2'')
- pieces of string (18" each)
- small paper clips

For each pair of students

- 1 Floating Paper Clip Device
- 2 ring magnets

For each student

- *Balancing Forces* Investigation Notebook (51–53)

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:**

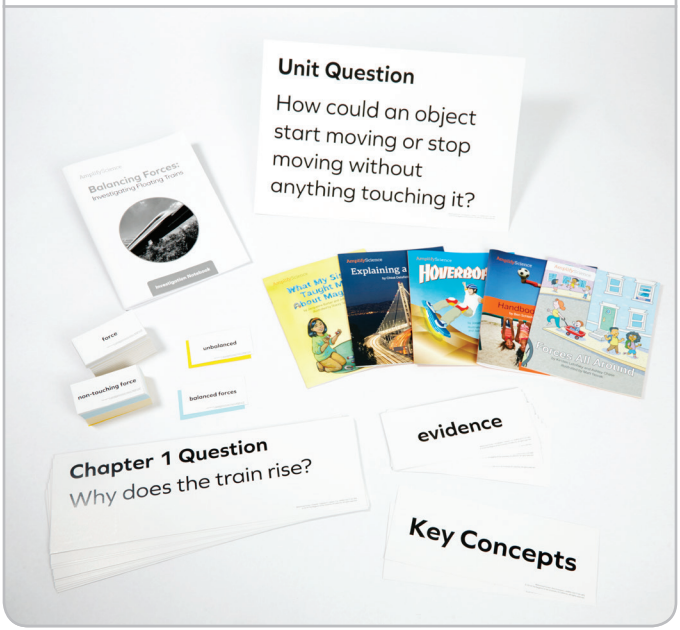
  Hoverboard

  Forces All Around

  Explaining a Bridge

  Handbook of Forces

  What My Sister Taught Me About Magnets



Inheritance and Traits

Students assume the role of wildlife biologists working in Greystone National Park as they study two wolf packs and are challenged to figure out why a wolf in one of the packs has different traits than the rest of its pack. Students investigate variation between and within different species, inherited and acquired traits, and conclude the unit by writing an explanation of the origin of the wolf's traits for the visitors in Greystone National Park.

Materials in this unit

Quantity	Description
3	clay, green, packs*
3	clay, red, packs*
3	clay, yellow, packs*
30	cups, clear, plastic
18	food coloring, blue, bottles*
18	food coloring, red, bottles*
300	stickers, round, blue*
300	stickers, round, red*
36	celery, stalks with leaves* Δ
90	crayons or color pencils (brown, grey, black, yellow, pink) Δ
9	index cards (3" x 5")* Δ
1	knife Δ
1	marker, permanent, black Δ
1	marker, wide tip, black Δ
108	paper clips Δ
14	paper, chart, sheets* Δ
36	pencils Δ
1–2	pitchers Δ
1	scissors Δ
1	stapler Δ
4	sticky notes, yellow, 3" x 3", pad (100 notes/pad)* □ Δ
1	tape, masking, roll* □ Δ
19	trays, plastic □ Δ
27	water, cups Δ

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

Example activity

Making Creatures

In Lesson 2.4 of *Inheritance and Traits*, students investigate how traits are passed down from parents to offspring by building clay creature offspring. Students work in pairs to make clay creature offspring with specific traits based on instructions that were randomly inherited from two parent creatures. In the discussion following the activity, students compare creatures and observe that, although the offspring inherited instructions from the same parents, there is variation in traits among siblings. This firsthand activity allows students to build on what they have been learning about inheritance.

Example activity materials

For each pair of students

- 3 pieces of clay (about 2 inches each of red, green, yellow)
- 1 strip of Parent 1 instructions
- 1 strip of Parent 2 instructions

For each student

- *Inheritance and Traits* Investigation Notebook (pages 40–43)

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:**

  The Code

  Scorpion Scientist

  Handbook of Traits

  Blue Whales and Buttercups

  How the Sparrow Learned Its Song

Environments and Survival

As engineers that specialize in biomimicry, designing structures that are modeled on organisms in the natural world, students investigate the adaptive traits of the Grove Snail population, and use what they learn to design a protective shell to transport endangered sea turtle eggs.

Materials in this unit

Quantity	Description
36	baggies, gallon*
36	cardstock, black, sheets
36	cardstock, white, sheets
5	clay, blocks (1 lb. each)*
1	cubes, probability, pack of 18
36	cups, plastic
1	cylinders, graduated, pack of 36
1	droppers, plastic, pack of 36
1	model pieces, pack of 36 (18 blue, 18 red)
1	pipe cleaners, pack of 576*
3	sticks, craft, boxes of 500 each*
1	sticks, skill, pack of 432*
8	straws, boxes of 100 each*
3	string, rolls*
36	tape, masking, rolls*
1	tape, packing, clear, roll*
1	tokens, black, pack of 600
1	tokens, white, pack of 360
18	glue sticks Δ
5	magnets Δ
1	marker, black, permanent, fine-tip Δ
1	marker, black, wide tip Δ
2	metersticks (or tape measures with metric measurements) Δ
9	paper clips, large Δ
180	paper clips, small Δ
4	paper, chart, sheets* Δ
36	paper, sheets (8.5" x 11")* Δ
–	pencils, colored (several for each pair of students) Δ
1–2	pitchers (or containers) Δ
1	scissors, adult (or paper cutter) Δ
18	scissors, safety Δ
1	stapler Δ
1	tape, masking, roll* □ Δ
2	timers or stopwatches (with second hands) Δ
18	trays, plastic □ Δ
36	water, cups* Δ

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Δ items provided by the teacher

Example activity

The *Hummingbird Model*

In Lesson 2.1 of *Environments and Survival*, students return to the grove snail data and begin to think about why snails with different traits are surviving differently. By observing a series of engaging images, students are introduced to the idea of variation within a population. Students then use a model to represent variation within a population of hummingbirds. In the Hummingbird Model activity, students take on the role of ruby-throated hummingbirds with distinct traits for beak structure. Students use their "beaks," made from modified pipettes, to model collecting nectar in their environment. Students measure the amount of nectar collected by the different beak structures, and the class uses the Environments and Survival Data Tool to compile and analyze their data.

Example activity materials

For the class

- droppers
- water Δ

For each group of four students

- 4 cups
- 4 graduated cylinders
- 4 labeled and prepared droppers (Beaks 1, 2, 3, and 4)

For each student

- *Environments and Survival* Investigation Notebook (pages 16–17)

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:**

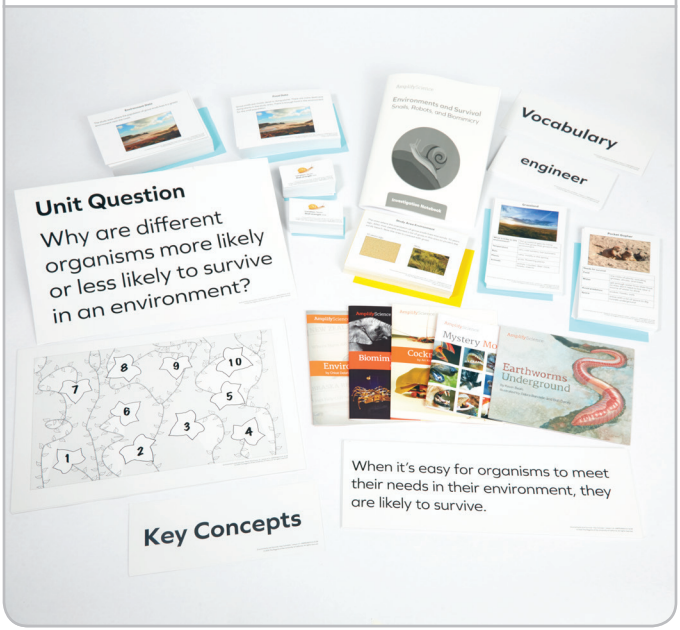
  Mystery Mouths

  Cockroach Robots

  Environment News

  Biomimicry Handbook

  Earthworm's Underground



Weather and Climate

As weather scientists for a nature conservation group, students determine which of four fictional islands will be the best location for an orangutan reserve. They analyze and interpret weather data in order to compare and construct arguments about the weather patterns for a particular location in the world over a given span of time.

Materials in this unit

Quantity	Description
36	bags, self-sealing, sandwich size*
9	containers, plastic, clear, rectangular
320	craft sticks*
90	cubes, plastic, interlocking
9	cups, clear, plastic, 12 oz.
72	cups, clear, plastic, 9 oz.*
9	cups, plastic, ½ oz.
1	index cards, blank, 3" x 5" pack (300 cards/pack)*
1	rain gauge
1	sticky notes, yellow, 3" x 3", pads (100 notes/pad)*
6	sticky notes, pink, 3" x 3", pads (100 notes/pad)*
1	sticky notes, green, 3" x 3", pads (100 notes/pad)*
288	straws, plastic, unwrapped*
1	thermometer, indoor/outdoor, jumbo, wall mount
27	thermometers, small
720	tokens, plastic, yellow
3	containers, plastic, 32 oz Δ
108	crayons or markers (3 different colors/student) Δ
1	hair dryer Δ
2	ice or chilled water, trays* Δ
1	kettle, electric or microwave Δ
1	knife or sharp, pointed object Δ
1	marker, permanent, black Δ
1	marker, wide tip, black Δ
108	crayons or markers (3 different colors/student) Δ
1	hair dryer Δ
2 trays	ice or chilled water* Δ
1	kettle, electric or microwave Δ
1	knife or sharp, pointed object Δ
1	marker, permanent, black Δ
1	marker, wide tip, black Δ
18	paper clip Δ
12	paper, chart, sheets* Δ
1	paper cutter or scissors Δ
18	pennies Δ
1	ruler, millimeter marks Δ
1	stapler Δ
2	tape, masking, rolls* □ Δ
9	trays, plastic □ Δ
1	water, gallon* Δ

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

Example activity

Measuring Rainfall

In Lesson 1.2 of *Weather and Climate*, students look at weather reports from Arc, Blue, and Creek Islands. The measurements were taken in different ways or not measured at all. Students use the Shared Listening discourse routine to discuss the data, considering what makes it easy and hard to compare weather between the islands. Through a hands-on activity, students explore ways to measure rainfall that will let them compare measurements, preparing them for a more in-depth look at weather measurements in the next lesson.

Example activity materials

For each group of four students

- 3 plastic cups, 9 oz.
- 1 plastic cup, 12 oz.
- 1 rectangular container
- 1 plastic cup, 1/2 oz.
- 1 popsicle stick
- 10 interlocking plastic cubes

For each student

- *Weather and Climate* Investigation Notebook (page 3)

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:**

  Sky Notebook

  World Weather Handbook

  Dangerous Weather Ahead

  What's Going On with the Weather?

  Seeing the World Through Numbers

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

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