

Grade 7 Hands-on activities





Hands-on investigation

Hands-on learning is at the heart of Amplify Science, and is integrated into every unit. For each hands-on activity, clear instructions are provided for the teacher, and materials are included 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, 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/science68.

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Geology on Mars

In their role as student planetary geologists working to investigate the planet Mars, students investigate whether a particular channel on Mars was caused by flowing water or flowing lava. Along the way, students engage in the practices and ways of thinking particular to planetary geologists, and learn to consider a planet as a system of interacting sub-systems.

Materials in this unit



Materials in this unit are packaged in 1 box.

Quantity	Description
4	buckets
1	clay, non-drying, 16 oz
20	rock samples, basalt
20	rock samples, conglomerate
10 kg	sand
2	trays, stream table

Print materials

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

- Chapter Questions
- Key Concepts
- Vocabulary
- Unit Questions
- Premium print materials (card sets, posters, etc.)

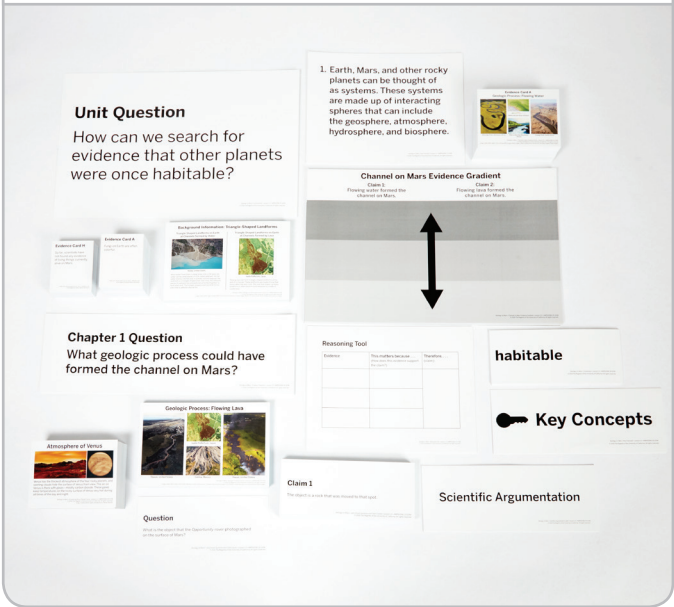


Plate Motion

Students play the role of geologists working for the fictional Museum of West Namibia to investigate *Mesosaurus* fossils found both in southern Africa and in South America. They learn that the surface of the Earth has changed dramatically over the Earth's history, with continents and ocean basins changing shape and arrangement due to the motion of tectonic plates. As the Earth's surface changes, fossils that formed together may be split apart.

Materials in this unit



Materials in this unit are packaged in 1 box.

Quantity	Description
20	cubes, 1"
20	Silly Putty®, containers
20	towels
40	transparencies, blank, 8.5" × 11", sheets
40	wet-erase markers, black
40	wet-erase markers, red

Print materials

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- Key Concepts
- Vocabulary
- Unit Questions
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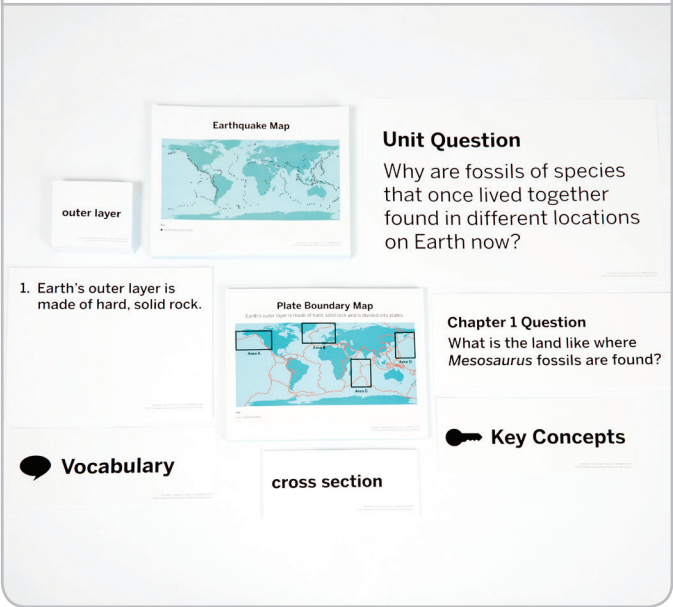


Plate Motion: Engineering Internship

Students act as mechanical engineering interns to design a tsunami warning system for the Indian Ocean region. These warning systems must meet three design criteria: 1) giving people as much warning time as possible to move to safety; 2) causing as few false alarms as possible; and 3) minimizing cost as much as possible. Students communicate like engineers and scientists do as they use their understanding of plate motion and patterns in data to create and justify their designs.

Materials in this unit



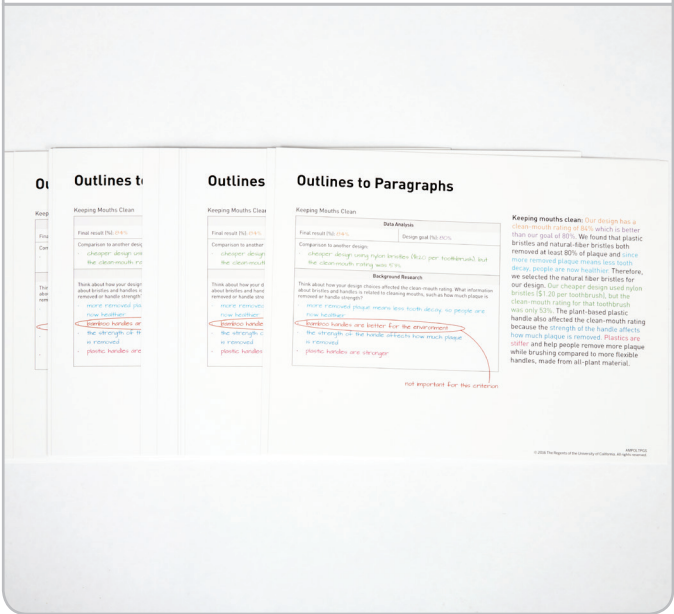
Materials in this unit are packaged in 1 box.

Quantity	Description
2	duct tape or packing tape, rolls
200	flexible drinking straws
64	miniature plastic buildings
8	paint trays
8	plastic transparency sheets

Print materials

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

- Research Proposal Outlines



Rock Transformations

Taking on the role of student geologists, students investigate a geologic puzzle: two rock samples, one from the Great Plains and one from the Rocky Mountains, look very different but are composed of a surprisingly similar mix of minerals. Did the rocks form together and somehow get split apart? Or did one rock form first, and then the other rock form from the materials of the first rock? To solve the mystery, students learn about how rock forms and transforms, driven by different energy sources.

Materials in this unit



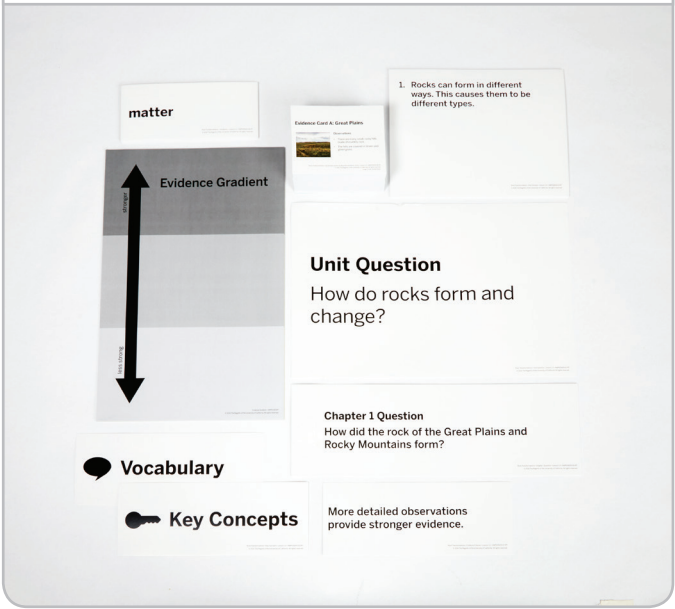
Materials in this unit are packaged in 1 box.

Quantity	Description
3	bags, plastic with zip, large
10	basalt rocks
10	conglomerate rocks
20	container, plastic, with lids
200	cups, plastic
10	granite rocks
300	hard candies
40	probability cubes (dice)
10	sandstone rocks

Print materials

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

- Chapter Questions
- Key Concepts
- Vocabulary
- Unit Questions
- Premium print materials (card sets, posters, etc.)



Phase Change

Taking on the role of student chemists working for the fictional Universal Space Agency, students investigate the mystery of a disappearing methane lake on Titan. One team of scientists at the Universal Space Agency claims that the lake evaporated while the other team of scientists claims that the lake froze. The students' assignment is to determine what happened to the lake. They discover what causes phase changes, including the role of energy transfer and attraction between molecules.

Materials in this unit



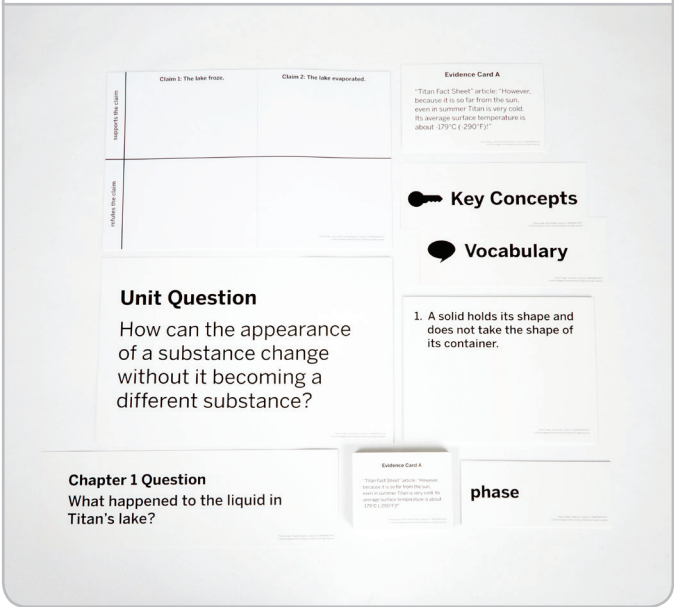
Materials in this unit are packaged in 1 box.

Quantity	Description
20	containers with lids, plastic
10	cups, foam
50	cups, plastic
40	dropper bottles
500 ml	Isopropanol alcohol
120	marbles, magnetic, low-strength

Print materials

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- Key Concepts
- Vocabulary
- Unit Questions
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Phase Change: Engineering Internship

Students act as chemical engineering interns to design an incubator for low-birthweight babies. Phase change materials (PCMs) are substances that store and release large amounts of energy during the phase changes of melting and freezing. Since they can easily be reused, PCMs are useful for everyday situations that require temperature control. Students select a combination of PCMs and an insulating lining material, applying concepts about phase change and energy transfer. These plans must meet three design criteria: 1) keeping the baby's average temperature as close as possible to 37°C; 2) minimizing the time the baby spends outside the healthy temperature range; and 3) minimizing costs so as many babies can be helped as possible. Students focus on the practice of using models while designing solutions to deepen their understanding of phase change; students also consider the flow of energy and how it affects the matter in their designs.

Materials in this unit



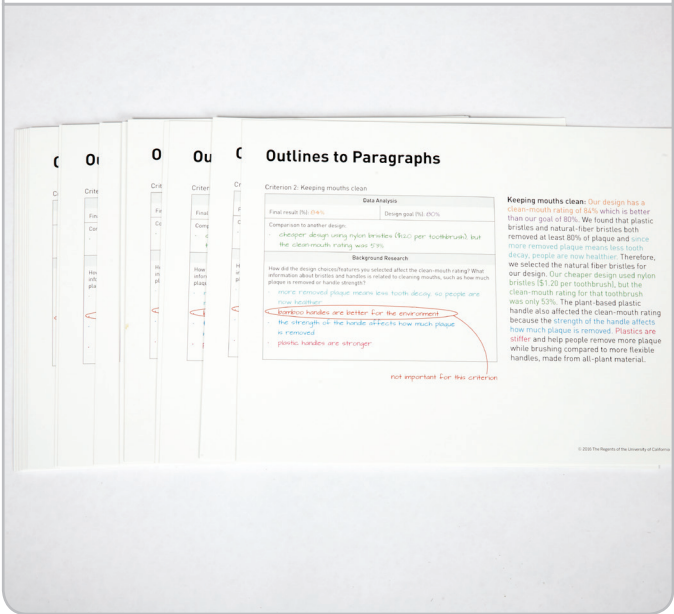
Materials in this unit are packaged in 1 box.

Quantity	Description
50	handwarmers
1	tongs

Print materials

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

- Research Proposal Outlines



Chemical Reactions

In the role of student chemists, students explore how new substances are formed as they investigate a problem with the water supply in the fictional town of Westfield. They analyze a reddish-brown substance that is in the water, the iron that the town's pipes are made of, and a substance from fertilizer found to have contaminated the wells that are the source of the town's water, and use their findings to explain the source of the contaminating substance.

Materials in this unit



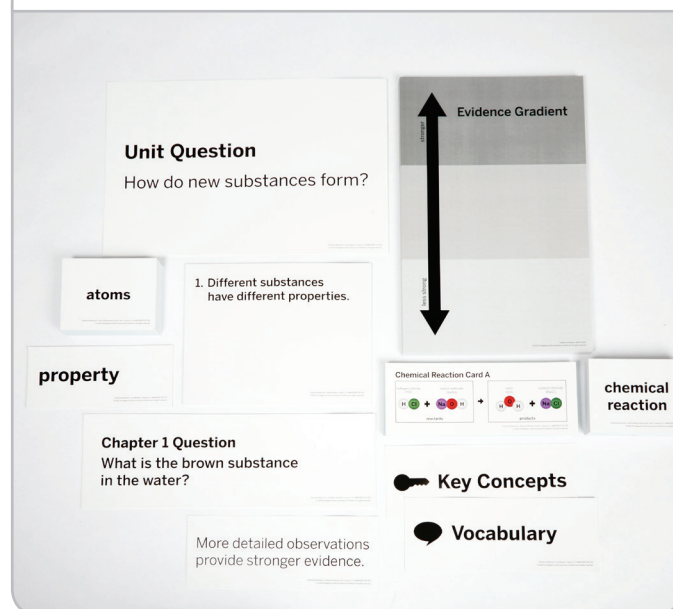
Materials in this unit are packaged in 1 box.

Quantity	Description
10	calcium chloride, tbsp
10	cornstarch, tbsp
150	cups, plastic, 9 oz
1	cylinder, graduated, 25 mL
1	funnel (plastic), small
10	graphite powder, tbsp
10	iron filings, tbsp
11	iron oxide granules, tbsp
184	labels for vials ["pipe substance" (30), "fertilizer" (30), "reddish-brown substance" (10), "sample 1" (10), "sample 2" (10), "sample 3" (10), "sample 4" (10), "well water" (1), "water from pipes" (1), "calcium chloride" (11), "sodium carbonate" (11), "product" (50)]
1	measuring spoon, ½ tbsp
1	measuring spoon, tbsp
10	potassium chloride powder, tbsp
10	sodium carbonate powder, anhydrous, tbsp
10	sodium chloride (table salt), tbsp
11	sodium nitrate powder, tbsp
120	tokens, amber
140	tokens, blue
20	tokens, gray
80	tokens, green
120	tokens, purple
200	tokens, red
80	tokens, white
20	tokens, yellow
72	vials, plastic, with lid

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- Vocabulary
- Unit Questions
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Populations and Resources

Glacier Sea has seen an alarming increase in the moon jelly population. In the role of student ecologists, students investigate reproduction, predation, food webs, and indirect effects to discover the cause. Jellyfish population blooms have become common in recent years and offer an intriguing context to learn about populations and resources.

Materials in this unit



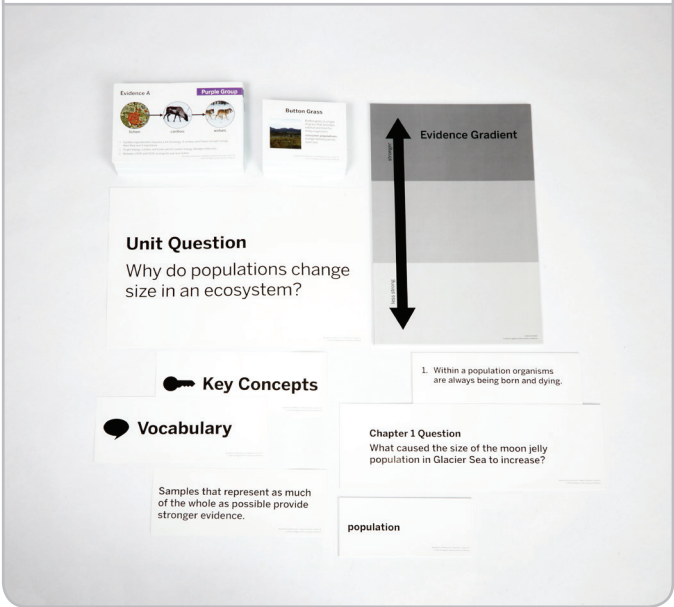
Materials in this unit are packaged in 1 box.

Quantity	Description
250	cups, plastic, 12 or 16 oz
20	cups, plastic, clear, 9 oz
10	graduated cylinders
20 each	measuring spoons, tablespoon and teaspoon
60 tsp	sugar, white, granulated
1	thermometer
520	tokens, plastic
150	wooden sticks
200 tbsp	yeast, baker's

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Matter and Energy in Ecosystems

As ecologists, students examine the case of a failed biodome, an enclosed ecosystem that was meant to be self-sustaining but which ran into problems. In the role of ecologists, students discover how all the organisms in an ecosystem get the resources they need to release energy. Carbon cycles through an ecosystem due to organisms' production and use of energy storage molecules. Students build an understanding of this cycling — including the role of photosynthesis — as they solve the mystery of the biodome collapse.

Materials in this unit



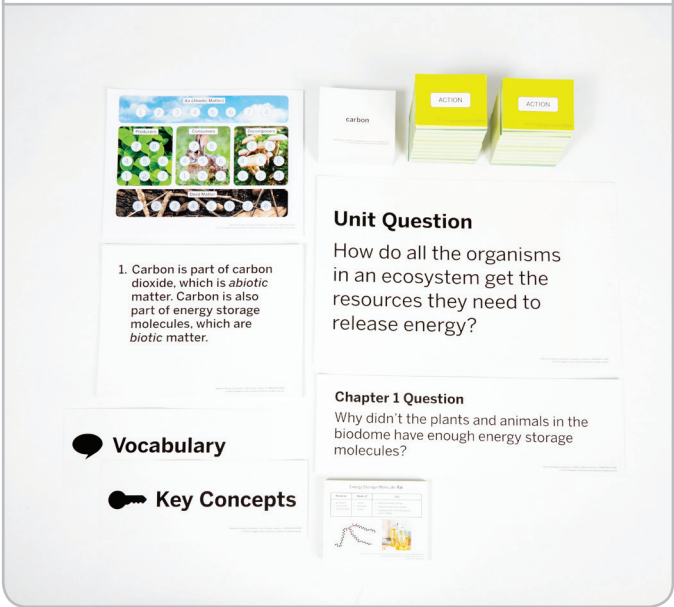
Materials in this unit are packaged in 1 box.

Quantity	Description
470	paper clips
600	tokens, black

Print materials

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- Vocabulary
- Unit Questions
- Premium print materials (card sets, posters, etc.)



Go to **amplify.com/science68**
for a list of all materials in each kit.

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