

# VOLCANOES & EARTHQUAKES



**WARNING!** Only for use by children over 10 years old. To be used solely under the strict supervision of adults that have studied the precautions given in the experimental set. Contains some chemicals which are classified a safety hazard. Read the instructions before use, follow them and keep them for reference. Do not allow chemicals to come into contact with any part of the body, particularly mouth and eyes. Keep small children and animals away from experiments. Store the chemistry set out of reach of small children. Eye protection for supervising adults is not included.

**WARNING** — Science Education Set. This set contains chemicals and/or parts that may be harmful if misused. Read cautions on individual containers and in manual carefully. Not to be used by children except under adult supervision.

### What's in your experiment kit:



### Checklist: Find – Inspect – Check off

✓	No.	Description	Qty.	Item No.
<input type="checkbox"/>	1	Plaster powder (250 g)	1	773675
<input type="checkbox"/>	2	Sodium bicarbonate	1	033532
<input type="checkbox"/>	3	Tartaric acid	1	033272
<input type="checkbox"/>	4	Measuring cup	1	708166
<input type="checkbox"/>	5	Wooden spatula	3	000239
<input type="checkbox"/>	6	Red food coloring	1	705822
<input type="checkbox"/>	7	Small bottle	1	702758
<input type="checkbox"/>	8	Screw top for small bottle	1	702759
<input type="checkbox"/>	9	Black plastic tube	3	701375
<input type="checkbox"/>	10	Bag with volcanic rock	1	770951
<input type="checkbox"/>	11	Die-cut sheet 1: seismograph, plate tectonics puzzle, volcano base, learning wheel frame	1	711074
<input type="checkbox"/>	12	Die-cut sheet 2: globe, learning wheel disks	1	711075
<input type="checkbox"/>	13	Lid remover for chemical vials	1	070177
<input type="checkbox"/>	14	Bag of small parts: compass lead, push rivet, wooden beads, spring, screw	1 ea.	
		Two-pronged clips	2	773710
<input type="checkbox"/>	15	Safety glasses	1	052297
<input type="checkbox"/>	16	Polystyrene insert	1	711072

### Additional things you will need:

*Table, water, scissors, knife, three or four empty plastic yogurt containers, paper towels, glue, glue stick, tape, ruler, ballpoint pen, pencil, piece of paper or sticky note, screwdriver, newspaper or washable table surface, heavy book, two rubber bands, three small play figures, two coins, flat block of wood, four equal-size blocks of wood (cubes or squares), clay*

Any materials not contained in the kit are marked in *italic script* in the “You will need” boxes.

→ Before doing anything else, please check all the parts against the list to make sure that nothing is missing.

→ If you are missing any parts, please contact Thames & Kosmos customer service.

## Volcanoes: Mountains of Fire

Pages 7 to 13

Make your own volcano erupt!



## Volcano Locations and Plate Tectonics

Pages 22 to 26

Assemble a globe and learn where volcanoes are located.



## Earthquakes and Tsunamis

Pages 32 to 34

Make the Earth shake and measure the magnitude!



## Earthquake-safe Building

Pages 41 to 44

Learn why some houses remain standing while others collapse when there's an earthquake.



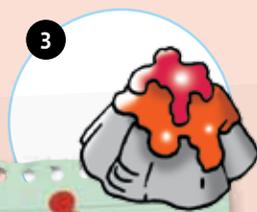
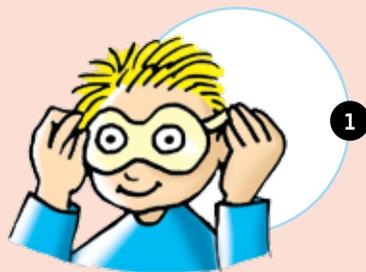
**CHECK IT OUT**

You'll find supplemental information on pages 14, 28, 37, and 45.

## Your volcano grows

### YOU WILL NEED

- safety glasses
- volcano from Experiment 2
- sodium bicarbonate
- tartaric acid
- bottle
- lid
- black plastic tube
- plaster
- red coloring
- measuring cup
- wooden spatula
- *paper towels*
- *water*
- *empty yogurt container*



### HERE'S HOW

1. Put on your safety glasses again.
2. Insert the black plastic tube into the volcano from below to make sure that the crater remained clear after your first volcanic eruption.
3. If the opening is clear, then perform steps 3 through 11 from Experiment 2 again. You can mix your plaster paste to be a little thicker or thinner this time to create different lava effects.

#### Tip

If your volcano has grown too big, you can scrape off the plaster with a wooden spatula and toss it into the trash. Remove the polystyrene volcano from the base and rinse it thoroughly under the faucet. Gently bend the base to make the plaster crumble off.

**Safety note:** For sodium bicarbonate, tartaric acid, and plaster, see the “Information about hazardous materials” on page 5.

### → WHAT'S HAPPENING?

The new paste will flow over the older layers, and your volcano will gradually grow — just like in real life.

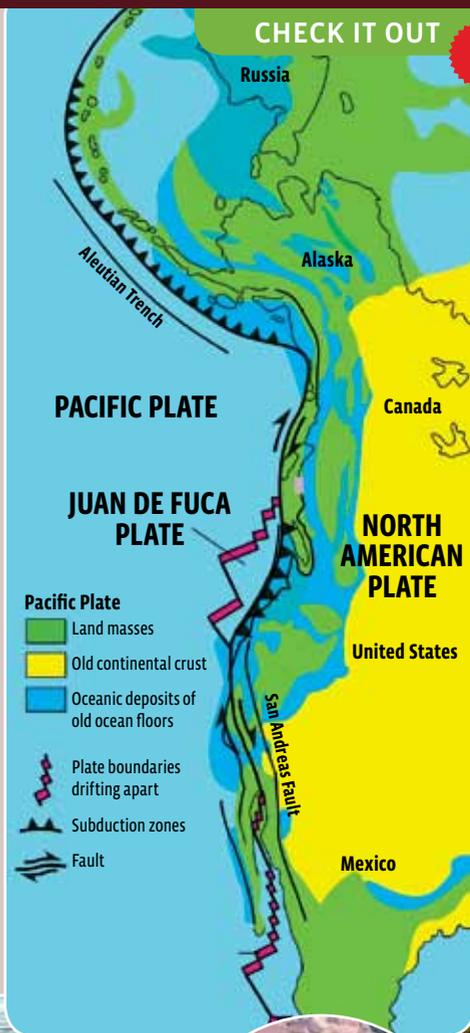
# WHEN THE EARTH SHAKES

In addition to volcanoes, your globe also shows you **areas threatened by earthquakes**. It is easy to see that where there are volcanoes, the Earth will often shake as well.

This is because volcanoes usually sit on the border between plates, and it is precisely at those same contact points between two or more plates that almost all earthquakes also occur.

The plates are not smooth, but have jagged edges and projections that grab onto each other as the plates slide by. The plates don't stay put when that happens; they keep getting pulled along. Tension accumulates in the rock until the jagged projections tear away with a jerk. It's this jerk that we experience as an earthquake.

## CHECK IT OUT



San Andreas Fault