

POCKET VOLCANO

A. OVERVIEW

Subject	Natural science
Age	6-10
Duration	45 minutes
Content	Volcanoes and volcanic eruptions; hazards of volcanoes
Goals	Students will understand : <ol style="list-style-type: none"> 1. The location of volcanoes on the Earth and the distribution of rock types 2. Volcanoes and fissures are locations where magma reaches the surface. 3. Volcanic eruptions result from tectonic plate motions. 4. Volcanic eruptions change human and wildlife habitats.
Objectives	Students will make a model volcano and create an eruption, and learn about what causes volcanic eruptions and what their effects are.
Materials	Volcano Making kit Baking soda Vinegar
Introduction	Background reading — Volcanoes and chemical reactions Class discussion — What causes volcanoes, volcano structure and eruptions, chemical reactions
Practical	Students will erupt a model volcano.
Extensions	Investigation and discussion points

B. BACKGROUND READING

Set the background reading as a homework assignment the day before the planned lesson.

Review

Start the lesson by reviewing the background reading. Make sure that students understand:

- What a volcano is and where volcanoes happen
- Products and effects of volcanic eruptions

Reading material

A volcano is a place on the Earth's surface where molten rock (magma) emerges from underground (or from under the sea bed).

The Earth has three main layers — a thin, outer crust, a thick mantle, where some rock is semi-molten, and a solid core. The crust and uppermost part of the mantle are broken into giant pieces called tectonic plates. The plates move around at speeds of a few centimetres a year. Most volcanoes happen at the edges of these plates (plate boundaries), where the plates are moving apart or being crushed together.

The main parts of a volcano are a cone, an underground magma chamber, and a conduit that carries magma to the vent, where the magma emerges. The vent is normally surrounded by a crater.

During an eruption lava (molten rock), ash (tiny particles of solidified magma) and gas come from a volcano's vent. The lava and ash are forced out of the vent by the gas. Some volcanoes produce mainly lava; others produce mainly ash and gas; others produce both.

Lava and ash from a volcano build up the landscape around the volcano. This normally creates a cone-shaped mountain. Rock formed from cooling lava and ash is called igneous rock.

Volcanoes are hazardous places. Lava flows destroy buildings and trees, but are slow-moving and rarely injure people. Ash can form extremely dangerous avalanches called pyroclastic flows. Other hazards are flying rocks called volcanic bombs and mudslides created when ash and water mix.

C. CLASS DISCUSSION

About volcanoes

- What is a volcano?
- Discuss the structure of the Earth and tectonic plates.
- Link tectonic plates to where volcanoes happen.

Volcanic eruptions

- What materials come out of a volcano?
- How do volcanoes change the landscape?

Volcano hazards

- Discuss the hazards of a volcanic eruption.

D. PRACTICAL

Each group requires 1 kit, 1 instruction sheet, some vinegar and baking soda.

Go through the safety warnings advised in the instructions with the class before assembly.

Check the progress of the each group.

E. EXTENSIONS

- How does the model volcano work?
- Where does the gas that causes the bubbles come from?
- What famous volcanoes do you know about?
- Are there any volcanoes on other planets?
- How do people living near volcanoes protect themselves from eruptions?
- What is one advantage of living near a volcano?
- Watch video of volcanic eruptions and effects.

F. INSTRUCTIONS

You may need to photocopy this section and hand out to each group of students if necessary.

A. SAFETY MESSAGES

1. Please read through this instructions before you start.
2. This Kit is intended for age 5 and up.
3. Adults assistance and supervision required.
4. Caution: do not perform the eruption in the fishing tank.

Clean the volcano with water after used.

B. INSTRUCTIONS

Turn open the bottom cover of the volcano and fill in the chamber with eruption material required. Close the cover and afterwards perform all different kinds of eruption following the below instructions.

1. IT'S TABLE TOP VOLCANO...

Simply add vinegar and baking soda into the volcano chamber and watch it erupts. It's awesome. (Remarks, the eruption could be quite messy, it is recommended you put your volcano on a plate when performing the eruption)

2. IT'S BATH VOLCANO...

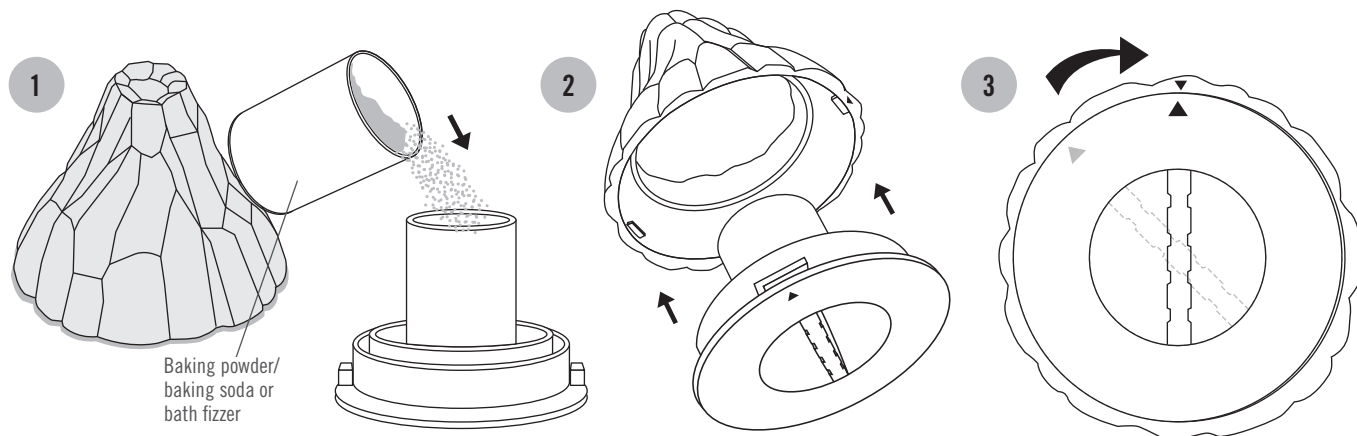
Crush a bath fizzer into small pieces and fill them into the volcano chamber. Watch your volcano to erupt in the bath and afterwards, enjoy a "volcanic eruption" bath!

3. IT'S A GLASS VOLCANO...

Add baking powder into the chamber and place the volcano into a glass of water. It is like an underwater volcano smoking in the deep ocean.

How does your Pocket Volcano works?

When the vinegar or water is mixed with baking powder/ baking soda/ bath fizzer, a gas, "carbon dioxide", a chemical "acetic" and water are made. All of them are harmless. It is the carbon dioxide gas which causes all those interesting eruptions on the table top on under the water.



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