

# ENVIRONMENTAL ATLAS OF ABU DHABI EMIRATE

## Lesson Plan: Volcanoes



# Lesson Plan: Volcanoes

## Lesson Plan Content:

This lesson plan and slide presentation is to be used in conjunction with::

- 1 x volcano teacher briefing
- 1 x volcano teacher fact sheet
- 1 x volcano class work sheet

## Lesson Overview:

Students will gain an understanding of volcanoes and volcanism.

## Estimated Time Requirement:

One 60 minute session.

## Learning Objectives:

Students will be able to:

- > understand volcano formation and types
- > identify key features of volcanic activity
- > see images of real active volcanoes
- > geographically locate 12 notable volcanoes

## Skills:

This lesson plan can aid students to demonstrate:

- > Researching skills
- > Classifying skills
- > Communicating skills
- > Observing skills

## Preparation prior to the lesson:

Before commencing the lesson, download and read through the teacher briefing, fact sheet, work sheet and this presentation so you are fully conversant with the content and key terms. Also, ensure that the work sheet activity is possible to undertake in your classroom environment.

## Lesson Sequence:

Here is a sequence of the lesson with suggested timings:

### Preparation (5mins)

Inform the students that today they are all going to learn about volcanoes and take part in some fun activity. Elicit from the students some of the things they already know about volcanoes.

### Presentation (25mins)

Using a projector to present to the class, progressively run through the slides to impart all the key points about volcanoes.

### Activity (25mins)

Having completed the presentation, undertake the participation and discussion exercise contained in the work sheet. This activity enables students to discover for themselves the notable volcanoes of the

world and some basic information about each volcano.

### Assessment (5mins)

Ask students to write and/or illustrate what they did during this lesson and what they learned from their participation in the activity.

### Close of Lesson

**Closure:** Ensure each group has corrected any incorrectly identified volcano locations or key facts.

**Extending the Lesson:** Encourage students to do some research at homes on volcanoes and discover other volcanoes across the world.

### Source of Lesson:

Abu Dhabi Global Environmental Data Initiative.

All supporting material can be downloaded freely at: [www.environmentalatlas.ae](http://www.environmentalatlas.ae)

# Classroom Presentation: Volcanoes



## What is a volcano?

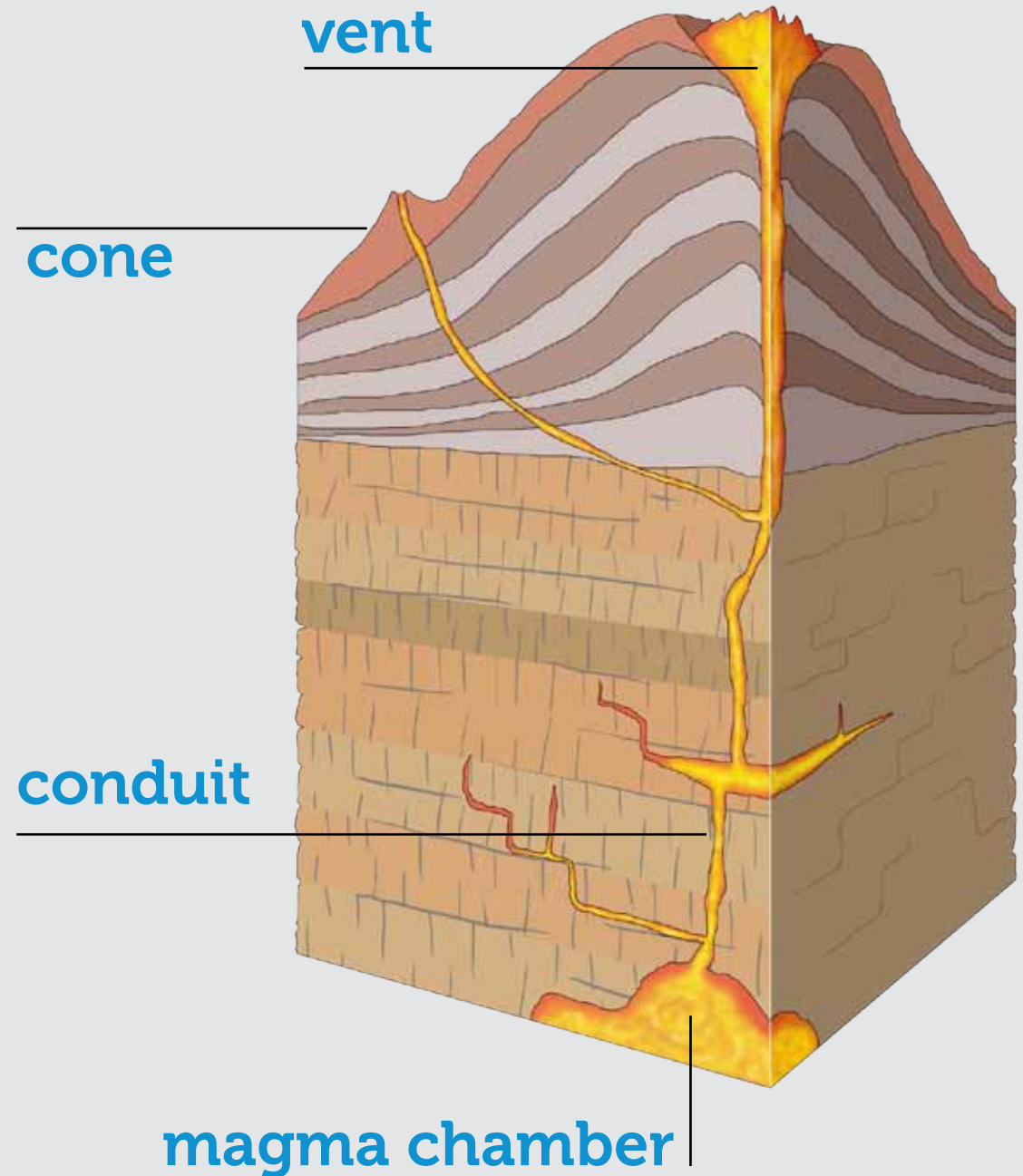
A volcano is usually a cone shaped mountain or hill that opens downward to a pool of molten rock below the surface of the earth.



## What is a volcano?

A volcano is a vent or 'chimney' that connects molten rock (magma) from within the Earth's crust to the Earth's surface.

The volcano includes the surrounding cone of erupted material.



## What is a volcano?

When pressure builds up, eruptions occur.

Gases and rock shoot up through the opening and spill over or fill the air with lava fragments.





## What is a volcano?

Some volcanoes even exist underwater, along the ocean floor or sea bed.





**Parinacota Volcano (20,827 ft) in South America**





**Koryaksky Volcano (11,339 ft) in Russia**



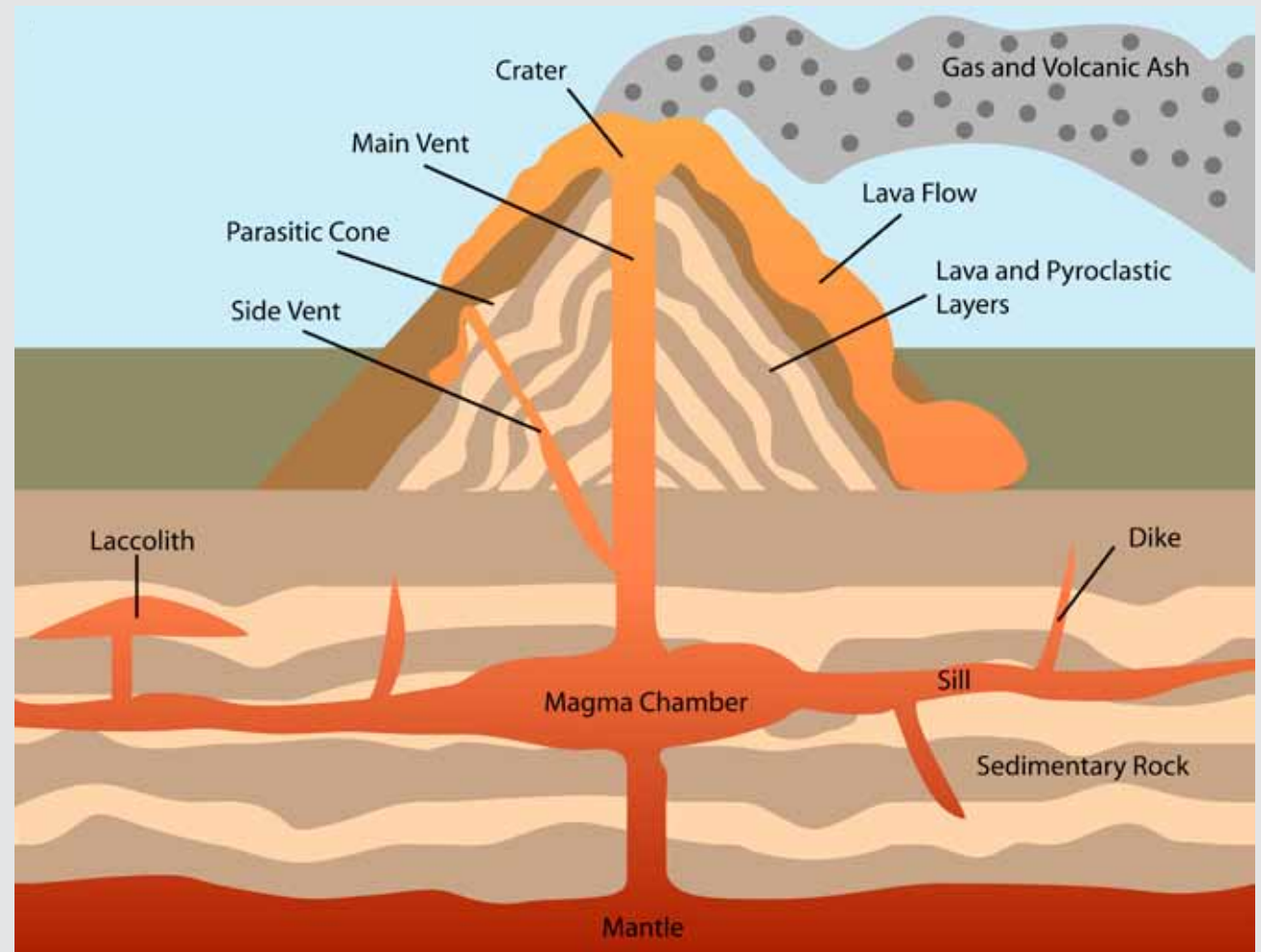
**Kilauea Volcano (4,190 ft) in Hawaii**



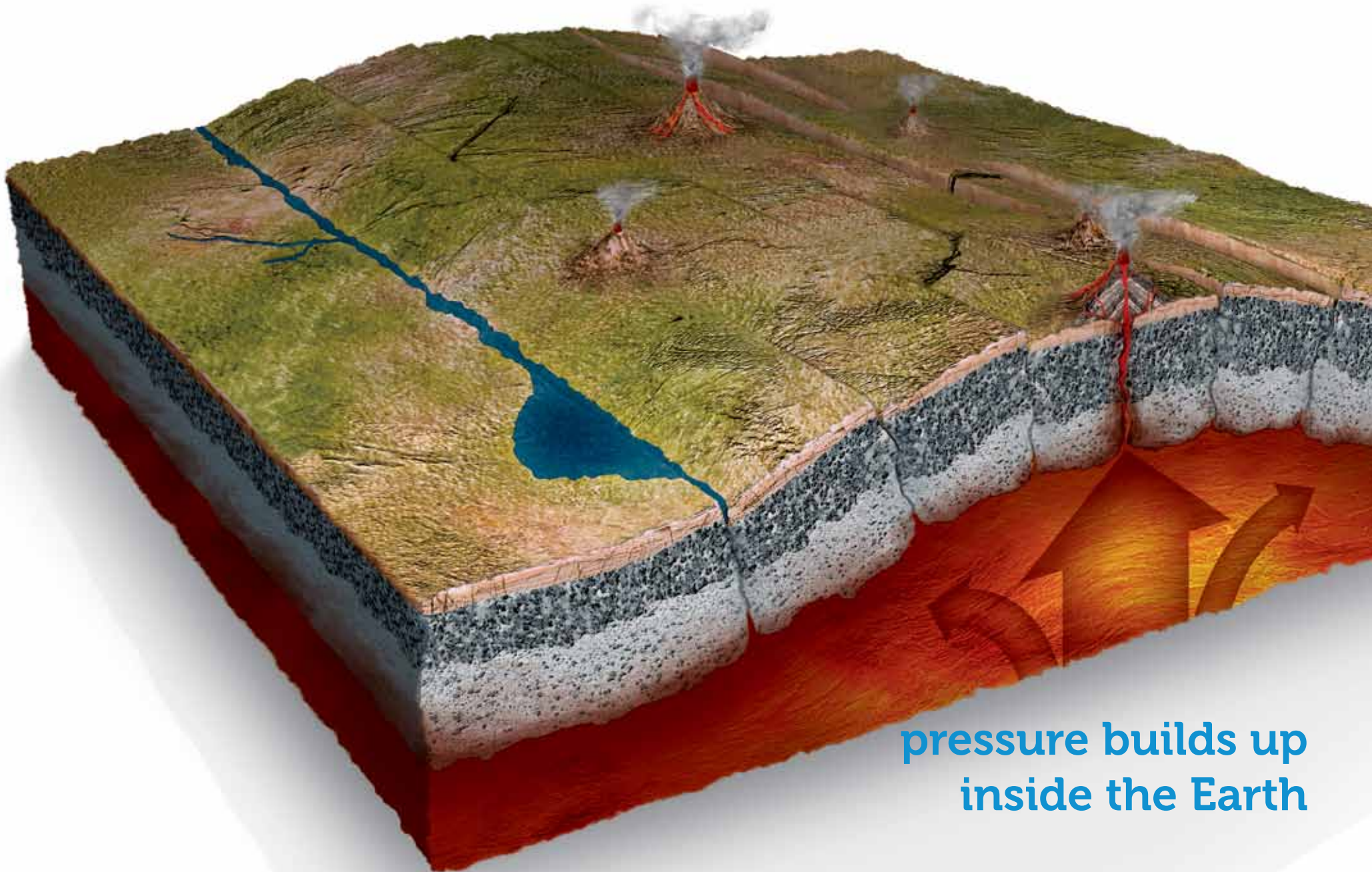
## How do volcanoes form?

Volcanoes form when magma reaches the Earth's surface, causing eruptions of lava and ash.

They occur at destructive and constructive plate boundaries.



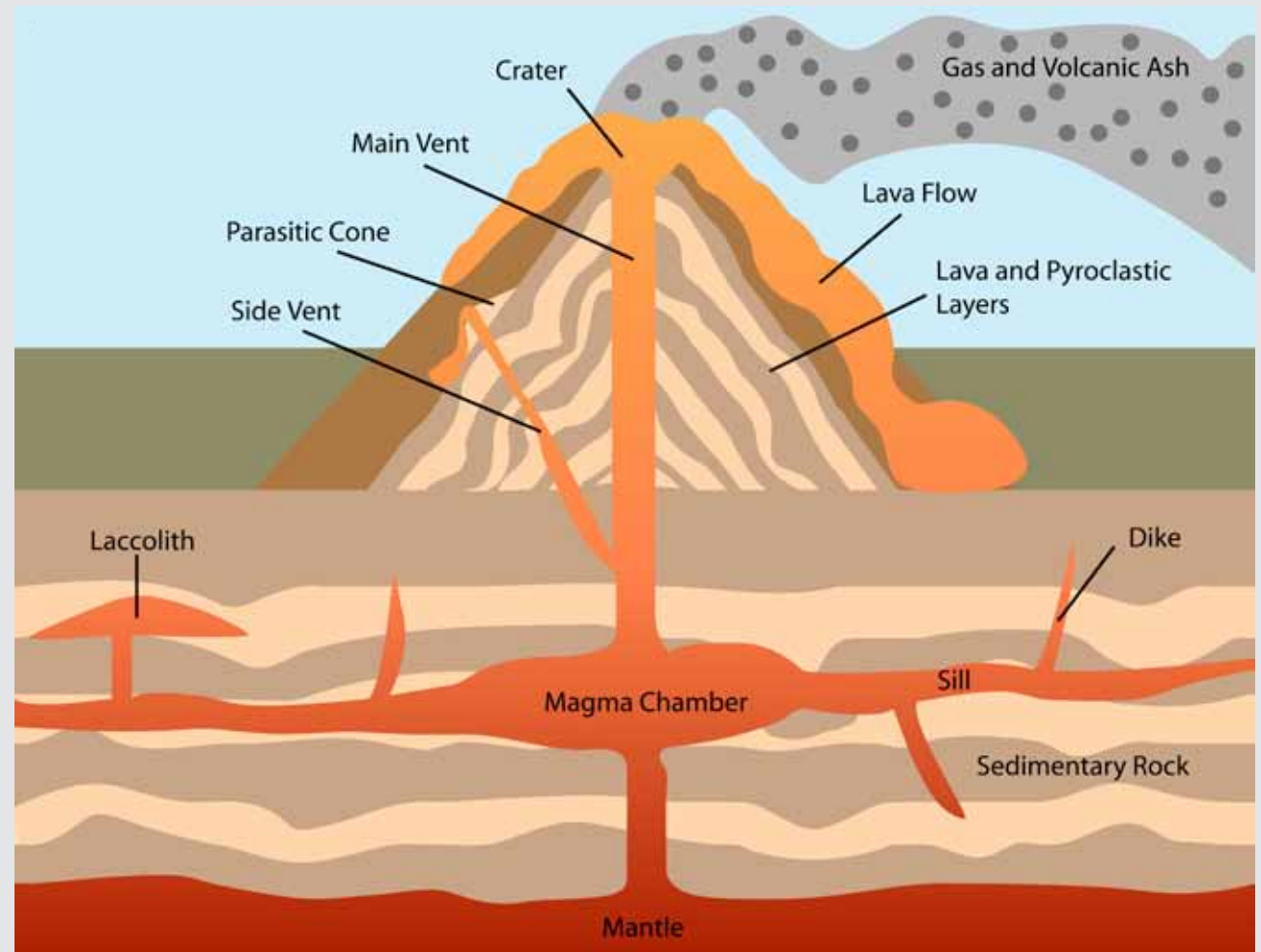




pressure builds up  
inside the Earth

## How do volcanoes form?

1. Pressure builds up inside the Earth.
2. When this pressure is released, eg as a result of plate movement, magma explodes to the surface causing a volcanic eruption.
3. The lava from the eruption cools to form new crust.
4. Over time, after several eruptions, the rock builds up and a volcano forms.



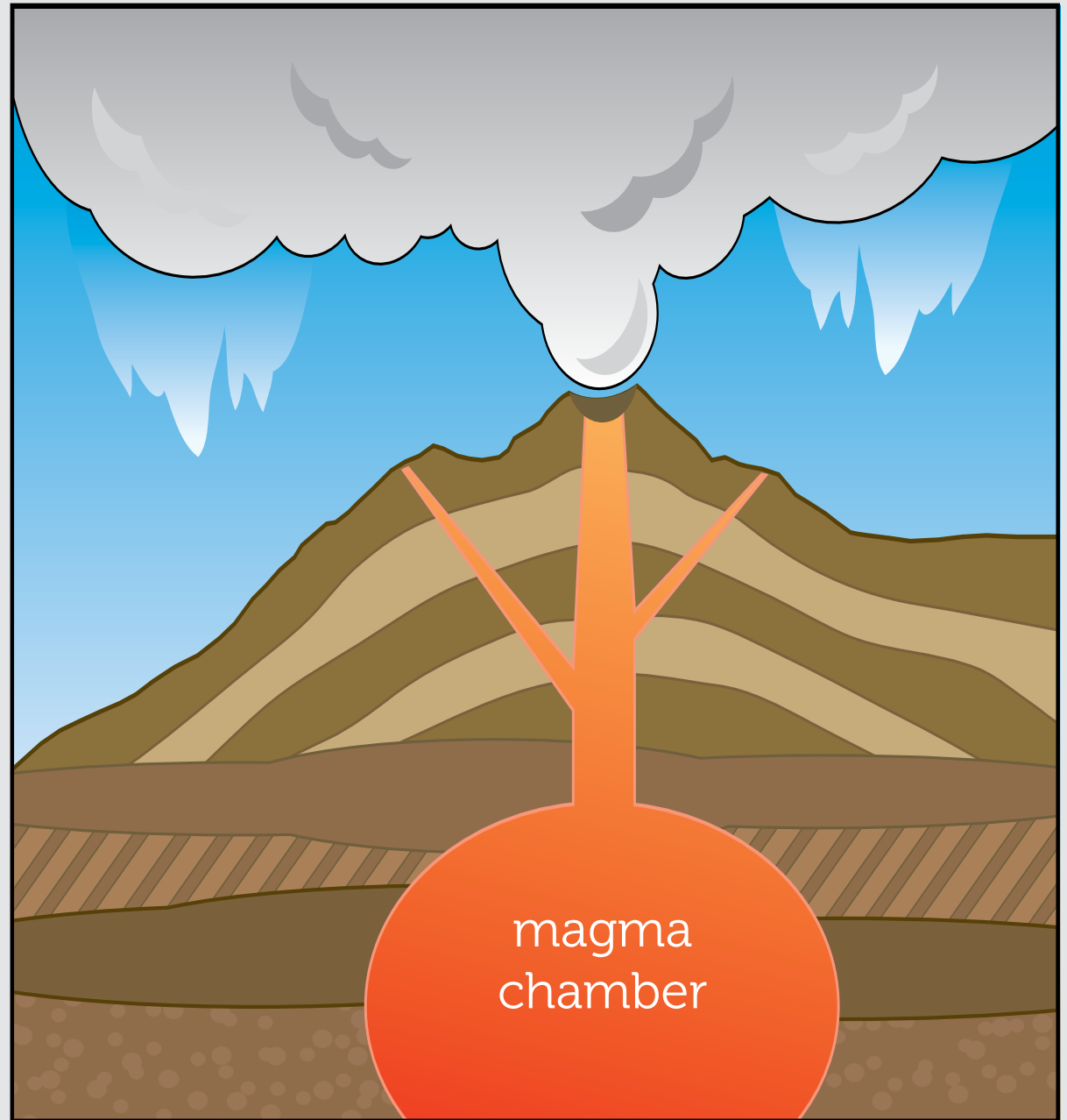
## Inside a Volcano

The magma chamber is a collection of magma inside the Earth, below the volcano.

The main vent is the main outlet for the magma to escape.

Secondary vents are smaller outlets through which magma escapes.

The crater is created after an eruption blows the top off the volcano.





## States of a Volcano

Volcanoes can be described in terms of activity and can be:

- > still **active** and erupt frequently
- > **dormant** (temporarily inactive but not fully extinct)
- > **extinct** (never likely to erupt again)



## Different types of volcano



### Shield volcanoes

Shield volcanoes, so named for their gently sloping sides.



### Composite volcanoes

Composite volcanoes or Stratovolcanoes are made up of alternating layers of lava and ash.



### Cinder cone volcanoes

A cone structure built by an accumulation of loose bits of magma called scoria that fall around a vent or crater after being expelled during moderately explosive activity.

## Volcanic Eruptions

Eruptions can cause:

- > lateral blasts
- > lava flows
- > hot ash flows
- > mudslides
- > avalanches
- > falling ash
- > floods





## Volcanic Eruptions

When magma reaches the Earth's surface it is called lava.

When the lava cools, it forms rock.

Volcanic eruptions can happen at destructive and constructive boundaries, but not at conservative boundaries.



## Volcanic Activity

In order to be considered active, a volcano must have erupted within the last few thousand years.

On the Earth today there are around 560 active volcanoes.

Each week 15 – 20 of these volcanoes will erupt.

Each year two or three volcanoes erupt that were previously thought to be dead.



## Volcanoes and Land Formation

Volcanoes create an almost infinite variety of landforms and terrain.

The main four landform types are:

- > lava flows
- > volcanic peaks
- > calderas
- > volcanic necks





## Lava Flows

Lava flows get their name from the manner in which the hot molten lava flows outward parallel to the surface of the Earth.

The result is a large flat lava covered plain. As additional lava flows escape from a volcano, they create layers of lava rock left behind from the many different flows.



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