

Volcanoes



These icons indicate that teacher's notes or useful web addresses are available in the Notes Page.



This icon indicates the slide contains activities created in Flash. These activities are not editable.

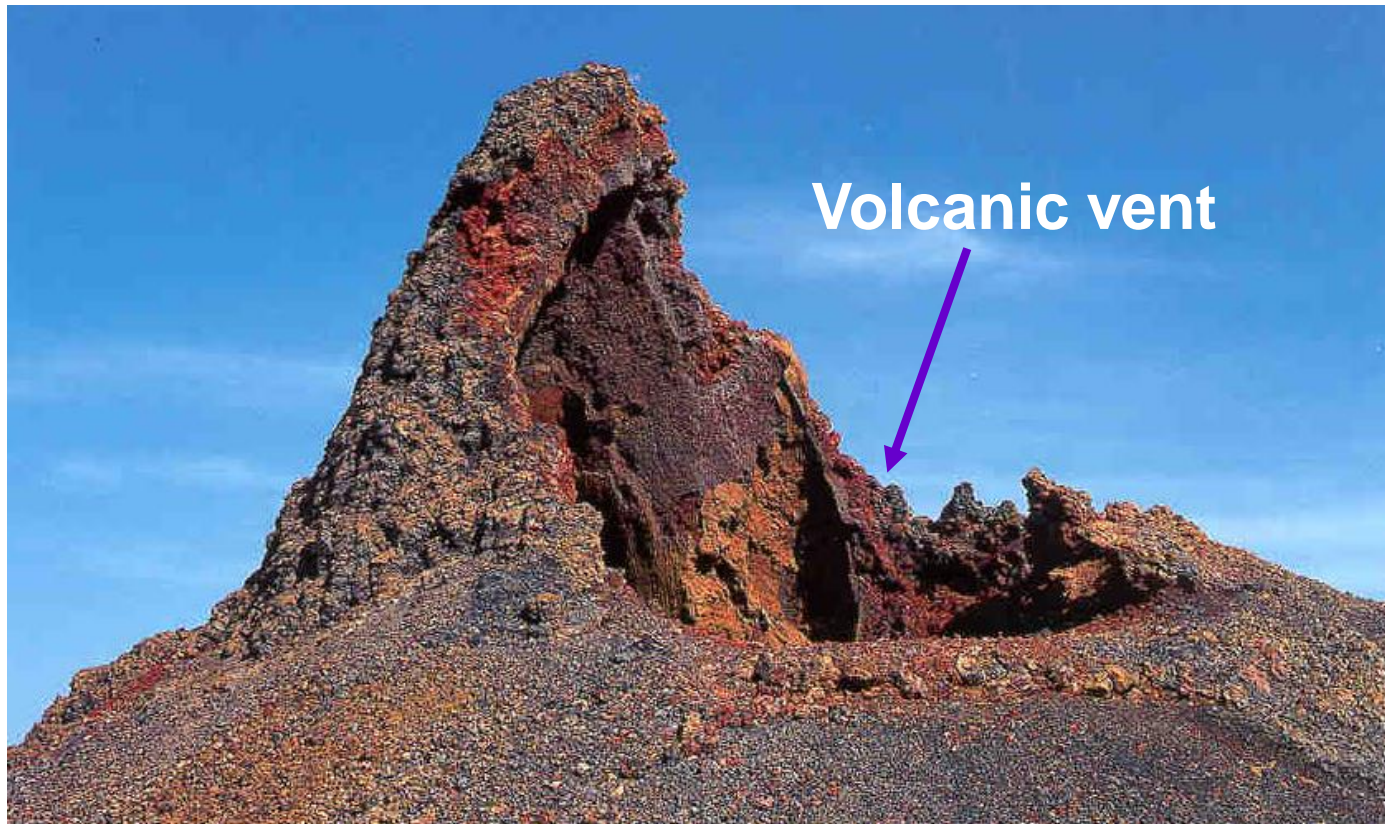
For more detailed instructions, see the *Getting Started* presentation.

- **What is a volcano?**
- Why do volcanoes occur?
- Where are volcanoes found?
- What happened in the 1980 Mount St Helens eruption?
- Can volcanic eruptions be predicted?
- Why do people live in volcanic areas?

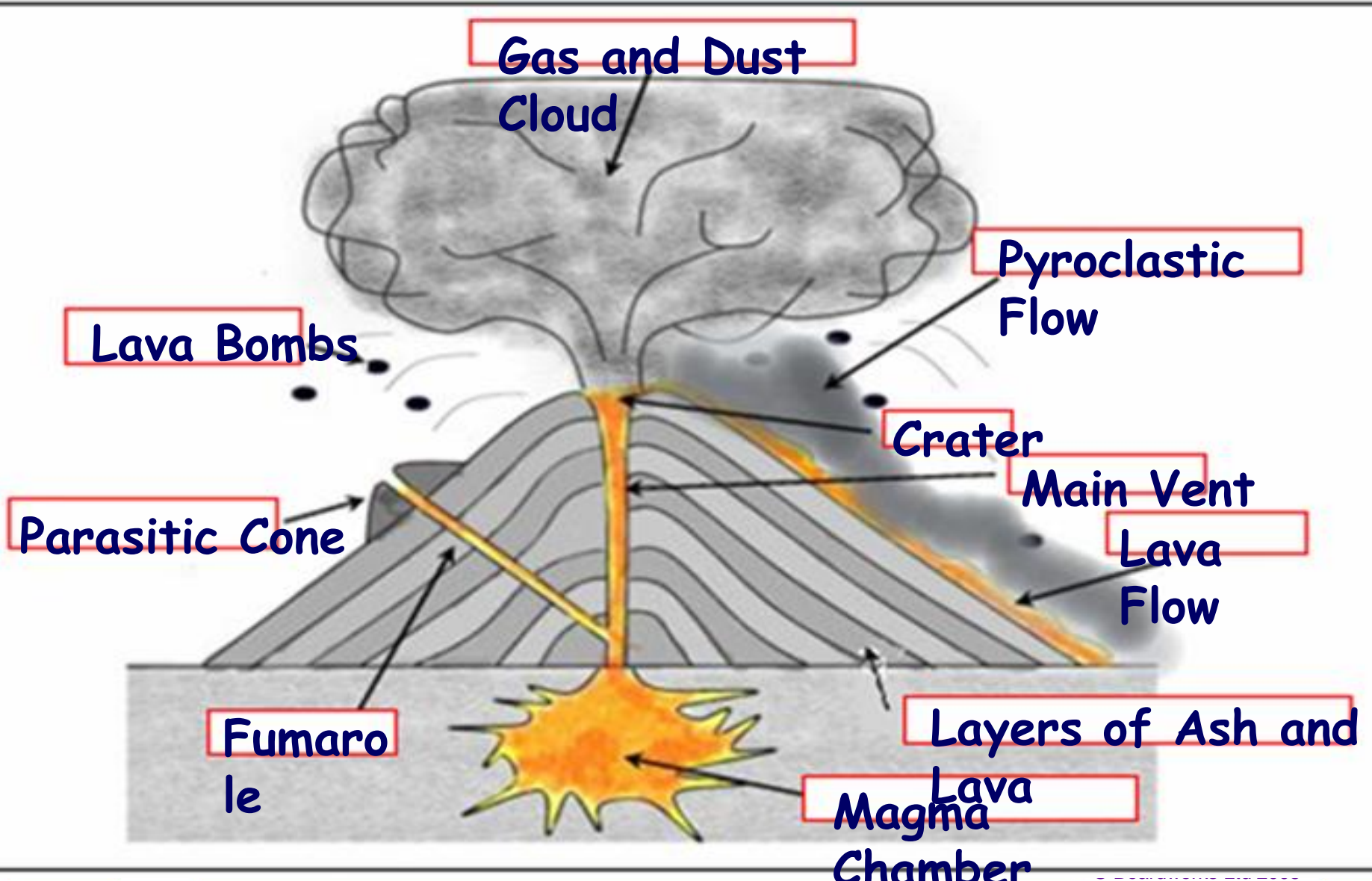


What is a volcano?

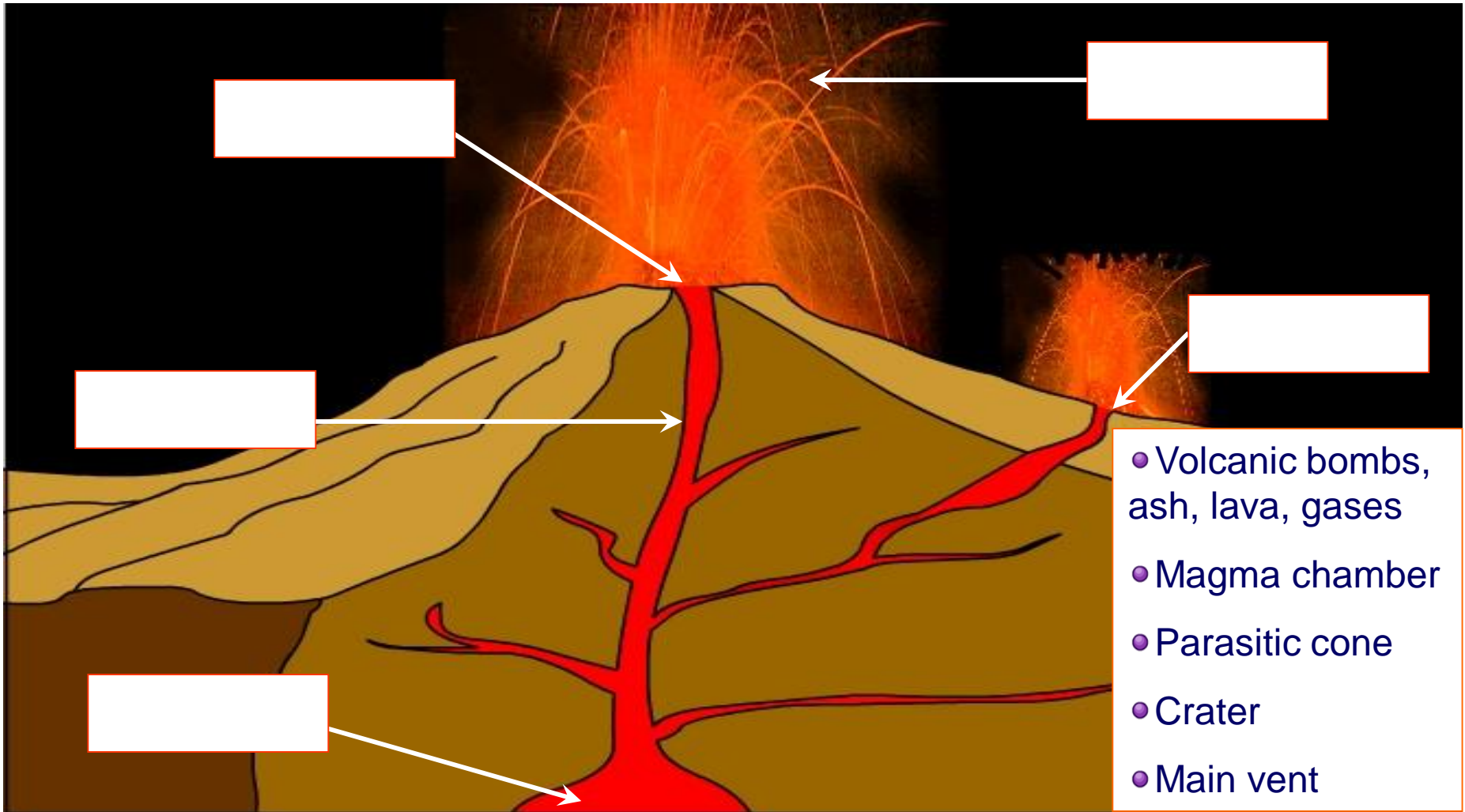
A volcano is an opening or **vent** in the earth's surface through which molten material erupts and solidifies as **lava**.



The Structure of a Volcano



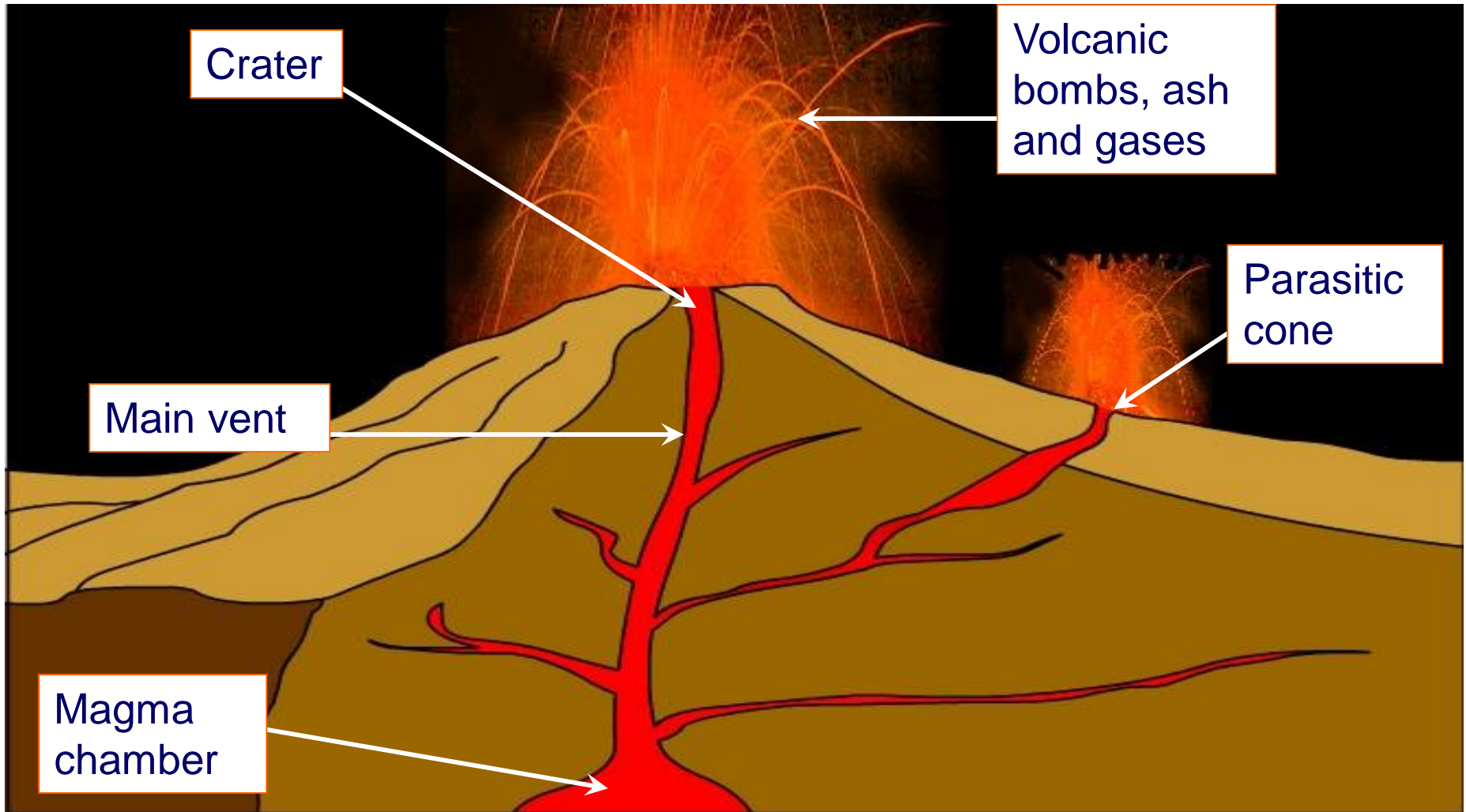
Label this cross section of a volcano



- Volcanic bombs, ash, lava, gases
- Magma chamber
- Parasitic cone
- Crater
- Main vent



Cross section of a volcano



Cross section of a volcano

Main vent

This is the depression at the top of the vent.

Magma chamber

This is the pipe up the middle of the volcano.

Crater

This is the source of the molten rock.

Parasitic cone

This is airborne material from the volcano.

Volcanic bombs,
ash and gas clouds

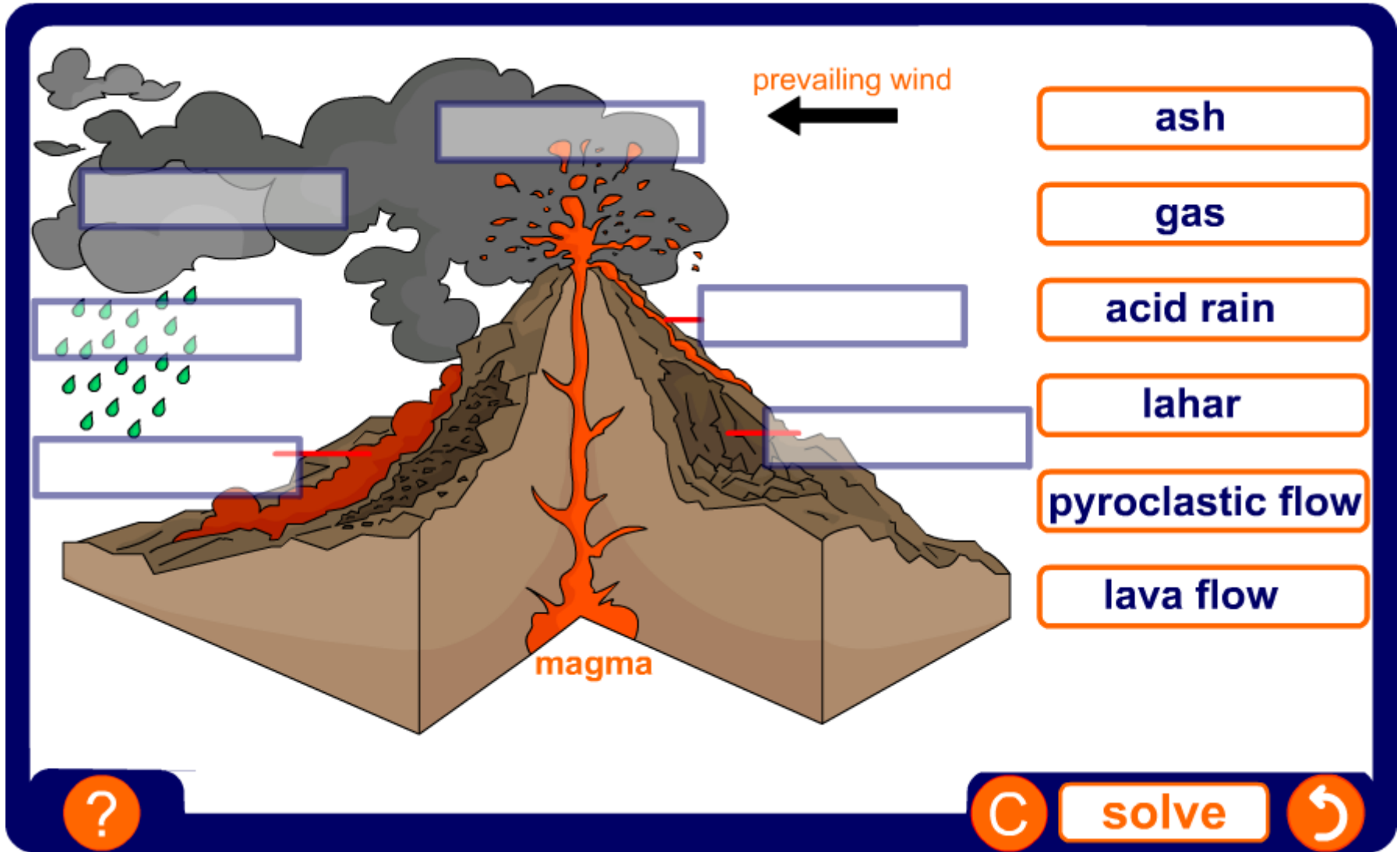
This is a secondary cone forming on the side of a volcano.



solve



Volcanic emissions



The diagram illustrates a volcano with a central magma chamber. Various emissions are shown: a large plume of ash and gas rising from the crater, acid rain falling from the plume, a lahar (mudflow) descending the left slope, a pyroclastic flow (fast-moving hot gas and ash) descending the right slope, and a lava flow (molten rock) moving down the right slope. A black arrow labeled 'prevailing wind' points from the right towards the volcano. Several empty boxes are placed around the volcano to identify these features. A list of terms is provided on the right side of the diagram.

prevailing wind

ash

gas

acid rain

lahar

pyroclastic flow

lava flow

magma

?

C solve ↺

Are you up to speed on your volcanoes?

Read the definition at the bottom and then
'shoot' the right answer...
press start to begin.

start



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Types of Volcano

There are 3 kinds of volcano:

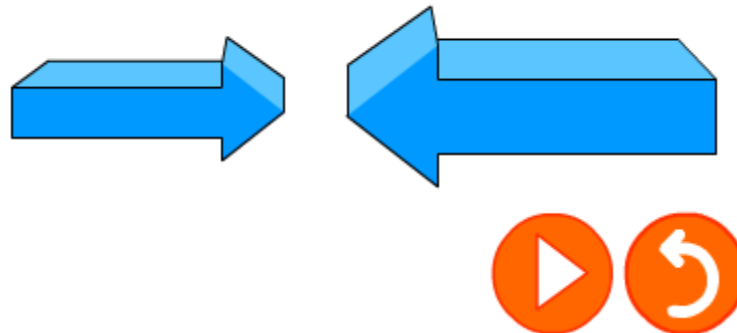
1. **Active**: An active volcano is one which still lets out steam, gas, and lava (e.g. Etna, Italy)
2. **Dormant**: A dormant volcano is a sleeping volcano which has remained quiet for a long time (Mauna Kea, Hawaii)
3. **Extinct**: An extinct volcano is one which can never erupt again (e.g. Edinburgh Castle)



Why do they happen?

Destructive plate boundaries involve two plates moving towards each other. The heavier plate is forced down below the lighter plate, into the mantle, where it melts.

The molten rock rises up to the surface through cracks in the rocks creating a volcanic eruption. These eruptions are usually very explosive because they are mixed with gases.



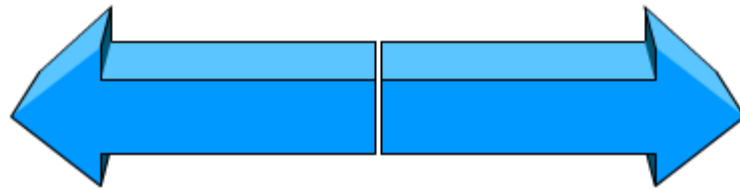
Destructive plate boundary



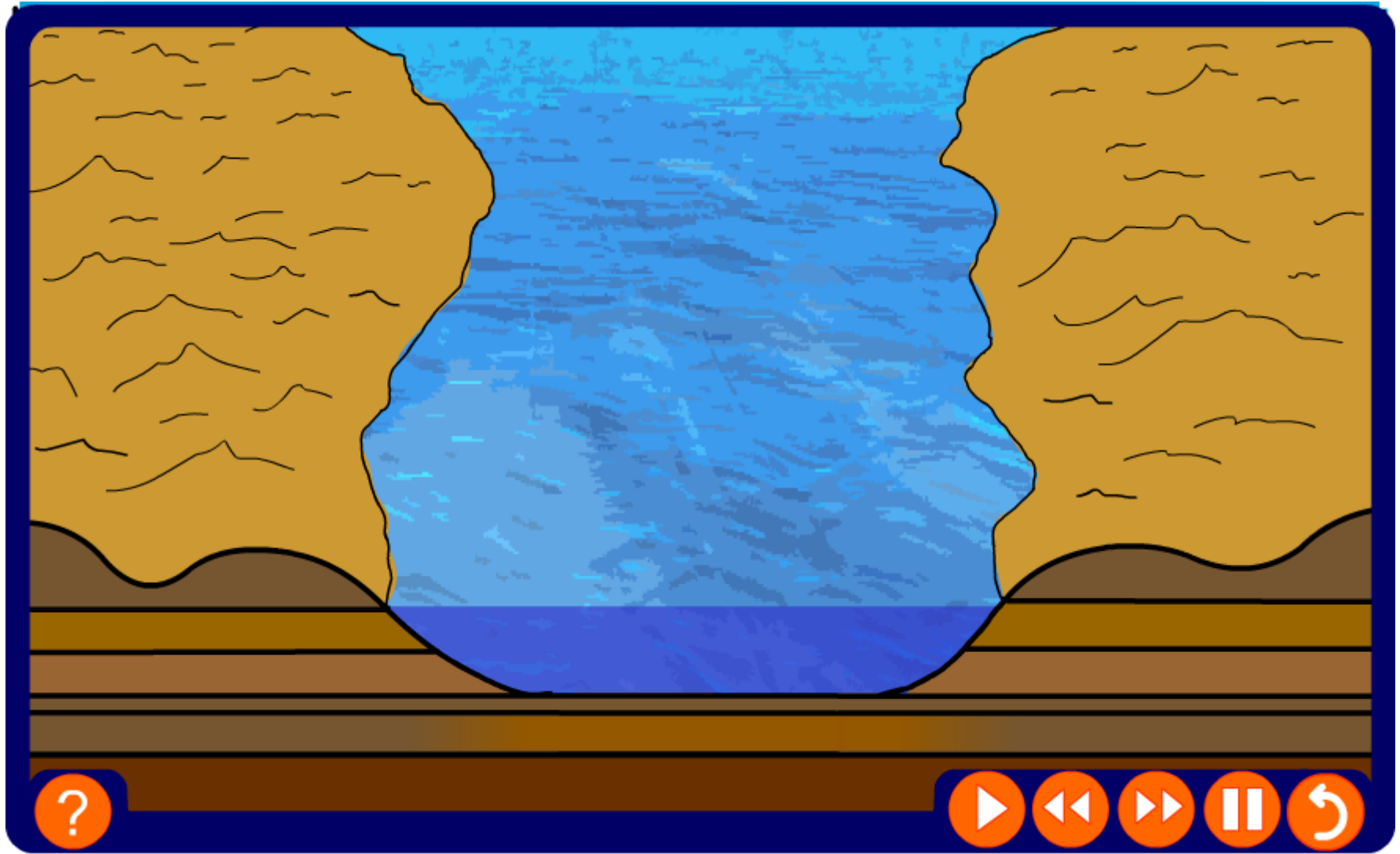
Why do they happen?

At a **constructive** plate boundary, two plates move apart.

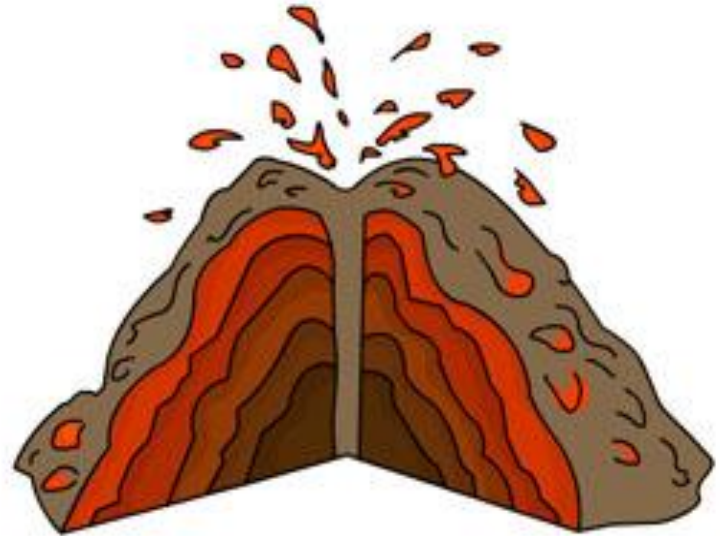
As the two plates move apart, magma rises up to fill the gap. This causes volcanoes. However, since the magma can escape easily at the surface, the volcano does not erupt with much force.



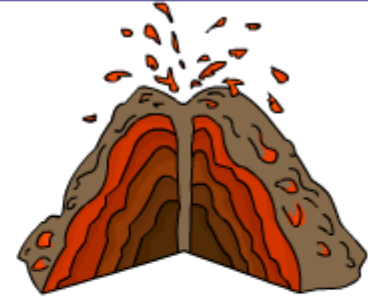
Constructive plate boundary



Why do volcanoes have different shapes?



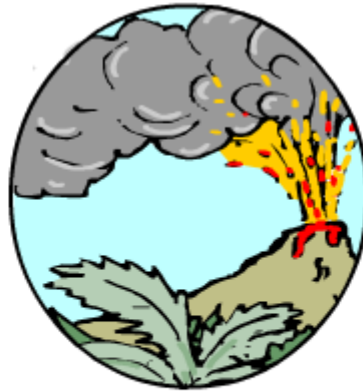
Why are volcanoes different shapes?



A large, empty yellow rectangular box intended for a student's answer to the question.



Read each question and click on the
answer of your choice.
Press **start** to begin.



start



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Where are volcanoes found?



zone of active volcanoes

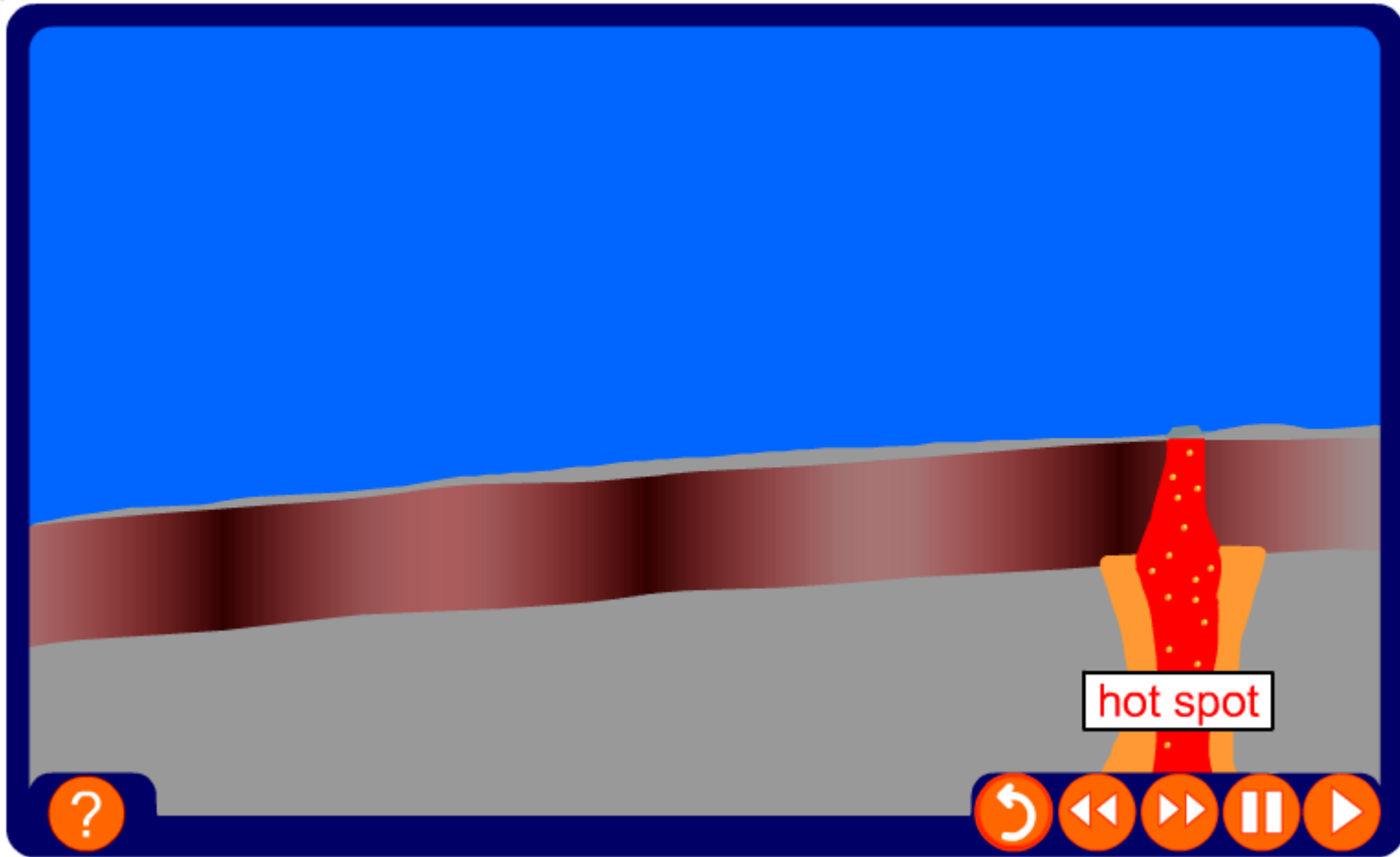


Around which plate do we find most volcanoes?

The Hawaiian islands are a chain of volcanoes in the Pacific Ocean.

Look at their location on the map below.
Why is this an unusual place for them to be located?





In the animation above, why are the volcanoes to the left of the 'hot spot' extinct?



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Mt St Helens eruption (May 1980)

Mt St Helens is located on the 'Ring of Fire'.

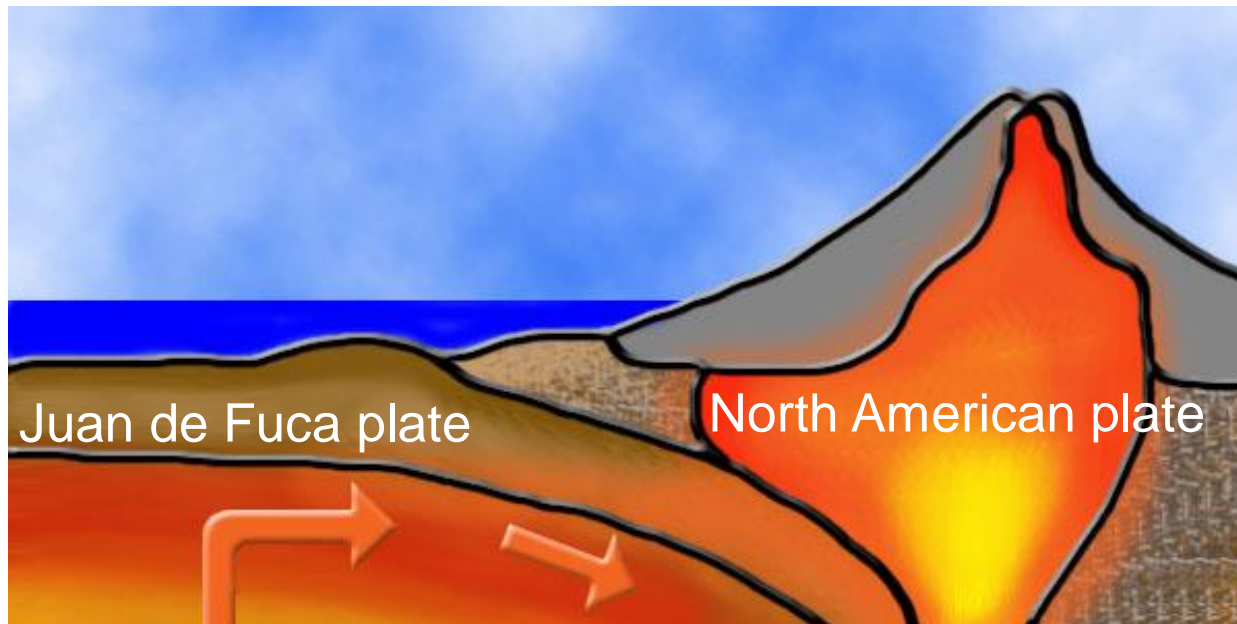


Internet Links

<http://volcano.und.nodak.edu/vwdocs/msh/msh.html>

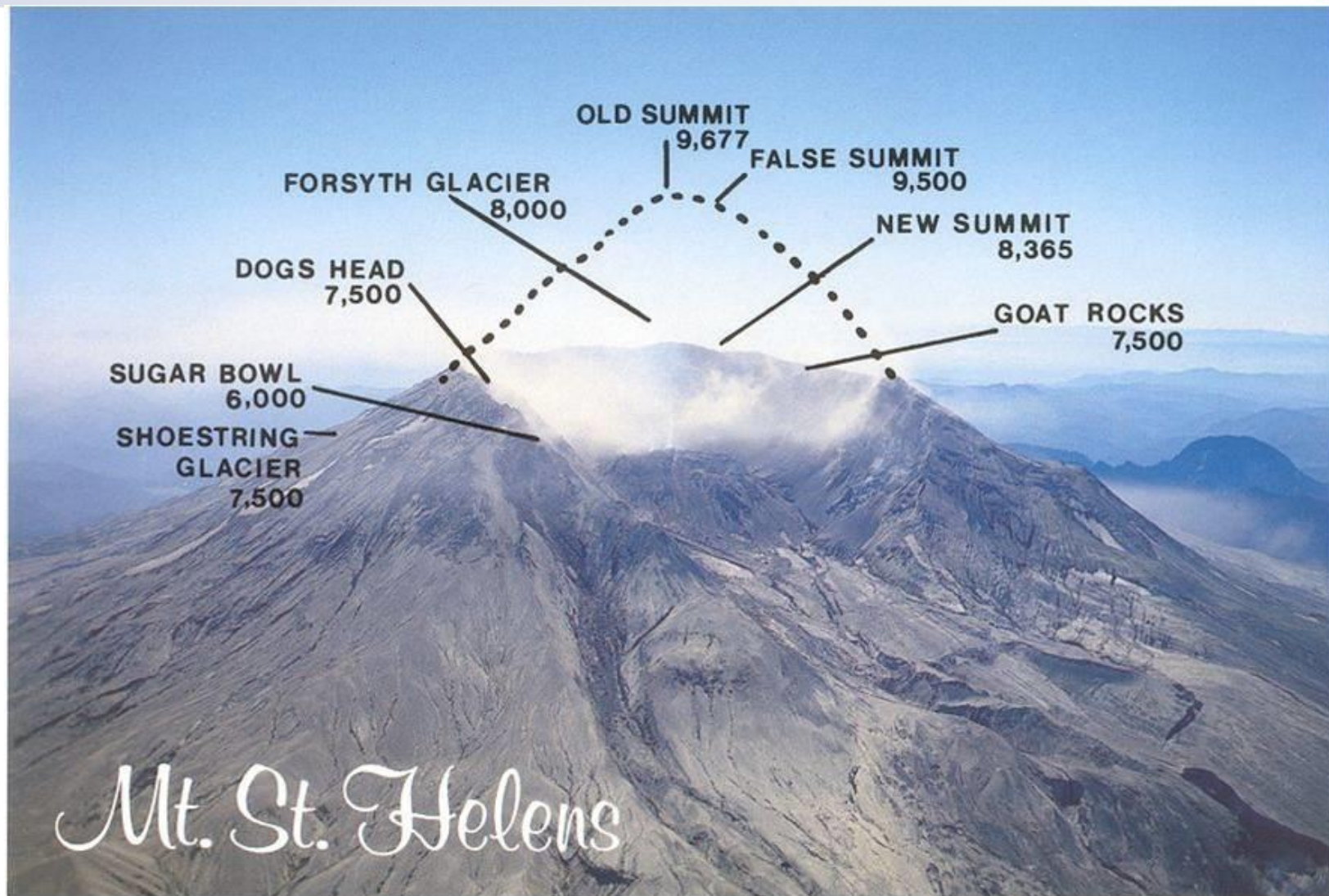
Mt St Helens – causes of the eruption

Mt St Helens is located on a **destructive** plate boundary where a continental plate (North American) meets an oceanic plate (Juan de Fuca).



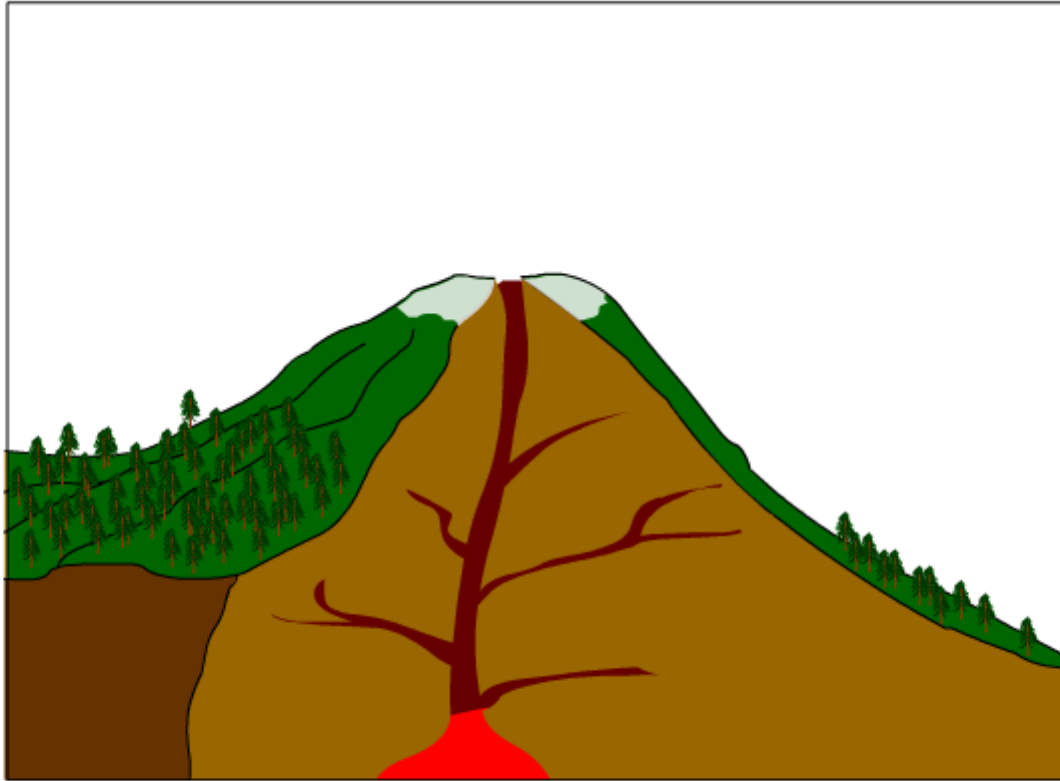
Which plate is denser?

Describe what happens when the oceanic plate descends under the continental plate.



Mt St Helens – the eruption

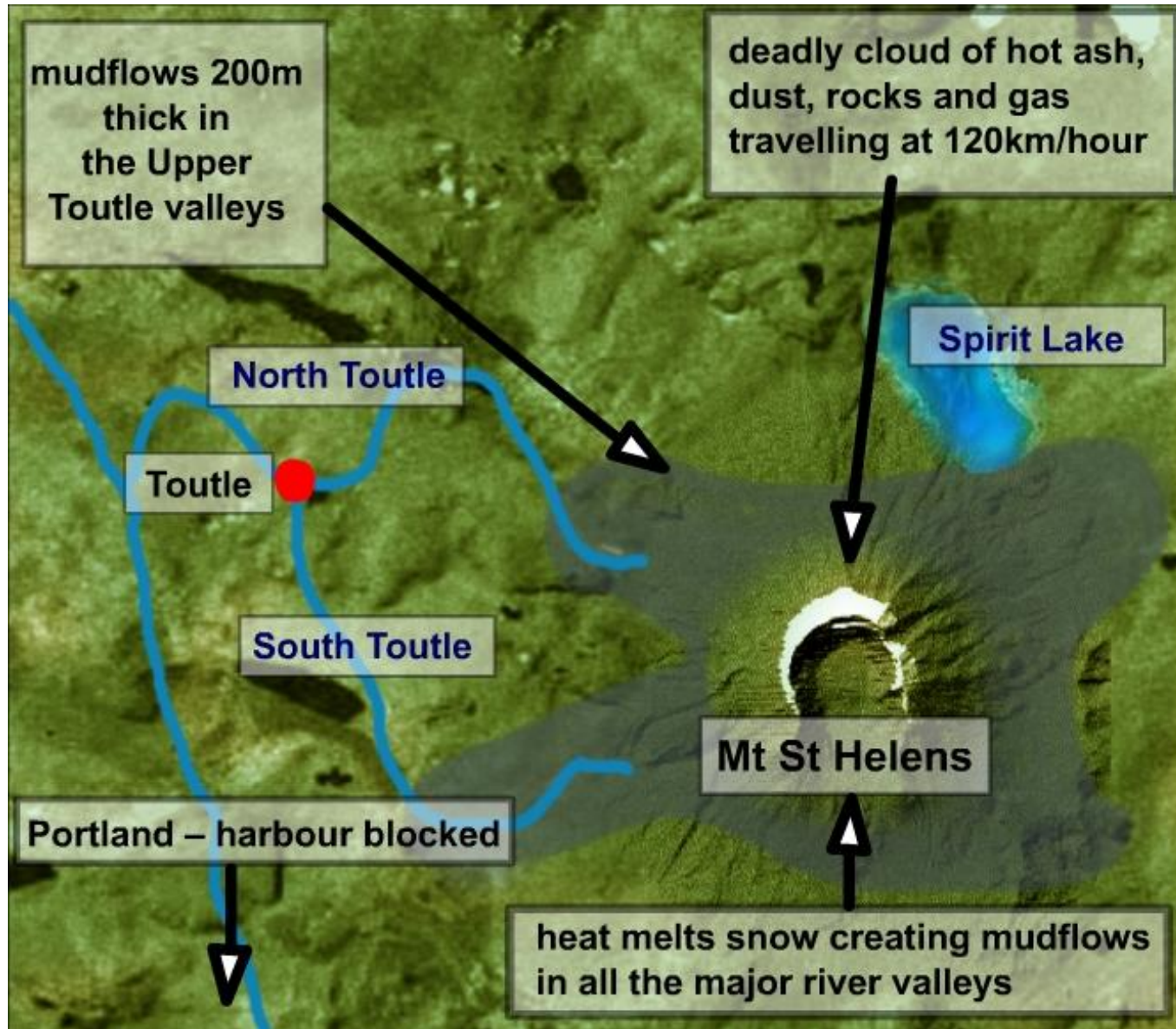
Stage 1 of 3



Shape of Mt St Helens at the beginning of 1980.



Mt St Helens – consequences of the eruption



0 10km



Mt St Helens – consequences of the eruption

AFTER



BEFORE



What damage did the eruption cause?



Separate these affects into the short-term and long-term impacts of the 1980 Mt St Helens eruption.



short-term



long-term

Gophers, through their tunnelling, mixed the soil with the ash. This increases the fertility of the soil.



Mt St Helens – consequences of the eruption

Why do you think animals such as the vole and gopher survived the blast?

How did their survival benefit the area?



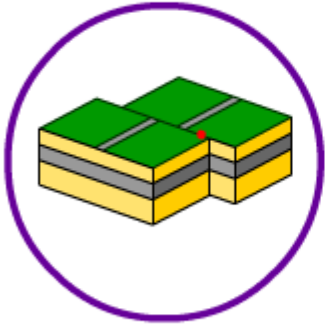
What benefits might the volcanic activity have brought to Mt St Helens?



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How can volcanoes be predicted?



The problem of prediction

Volcanologists (people who study volcanoes) are skilled at predicting the likelihood of an eruption.



However, it's very difficult to pinpoint exactly when an eruption will happen. Often, moving magma doesn't result in an eruption, but instead cools below the surface.

Monitoring potential eruptions is expensive. With many volcanoes erupting only every few hundred years, it's not possible to monitor every site.



- What is a volcano?
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- **Why do people live in volcanic areas?**



Why do people live in volcanic areas?



This lava is weathered (broken down) to form a fertile soil.



Can you think of any other reasons?

Tourists are attracted to areas of volcanic activity.



Geothermal energy can be produced in many volcanic areas.



- Volcano World - a fun and informative web site
<http://volcano.und.nodak.edu/>
- Virtual field visits
<http://educeth.ethz.ch/stromboli/>
- The Michigan Technological University Volcanoes Page
<http://www.geo.mtu.edu/volcanoes/>
- Global Volcanism Program
<http://www.volcano.si.edu/gvp/>
- Fallout: Eye on the Volcano
<http://www.nationalgeographic.com/features/98/volcanoes/>
- Savage earth
<http://www.pbs.org/wnet/savageearth/>

