



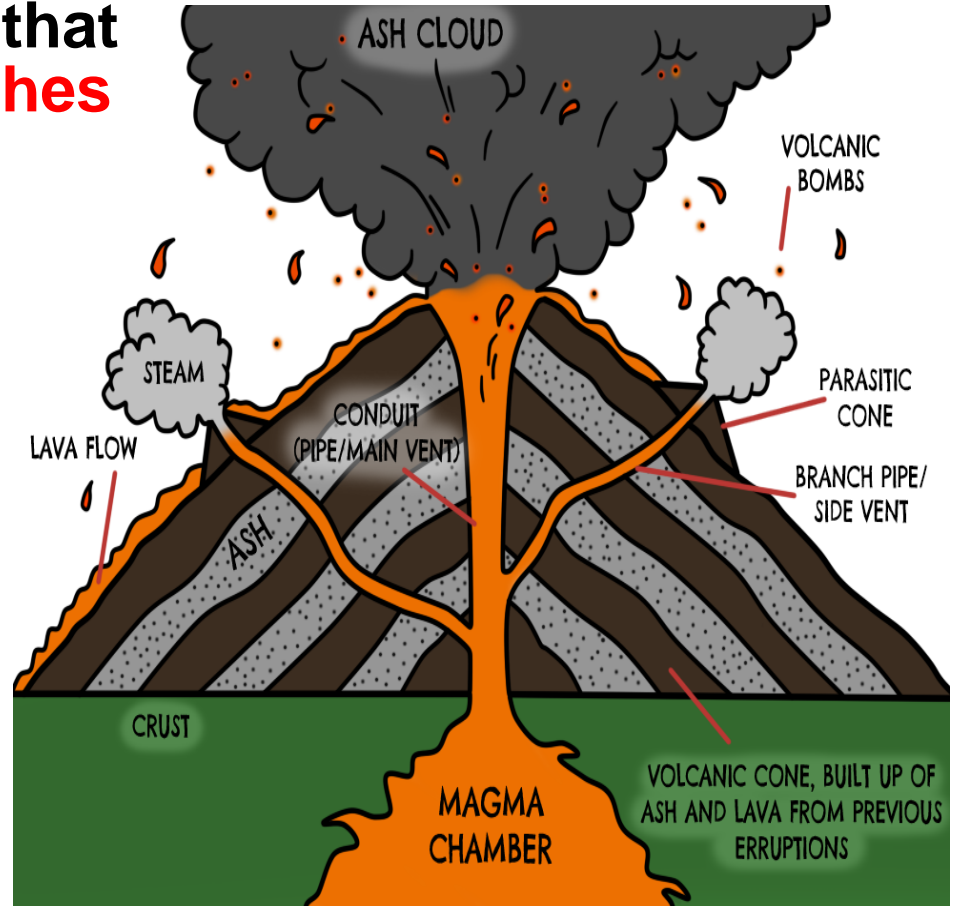
Volcanism

Part 1



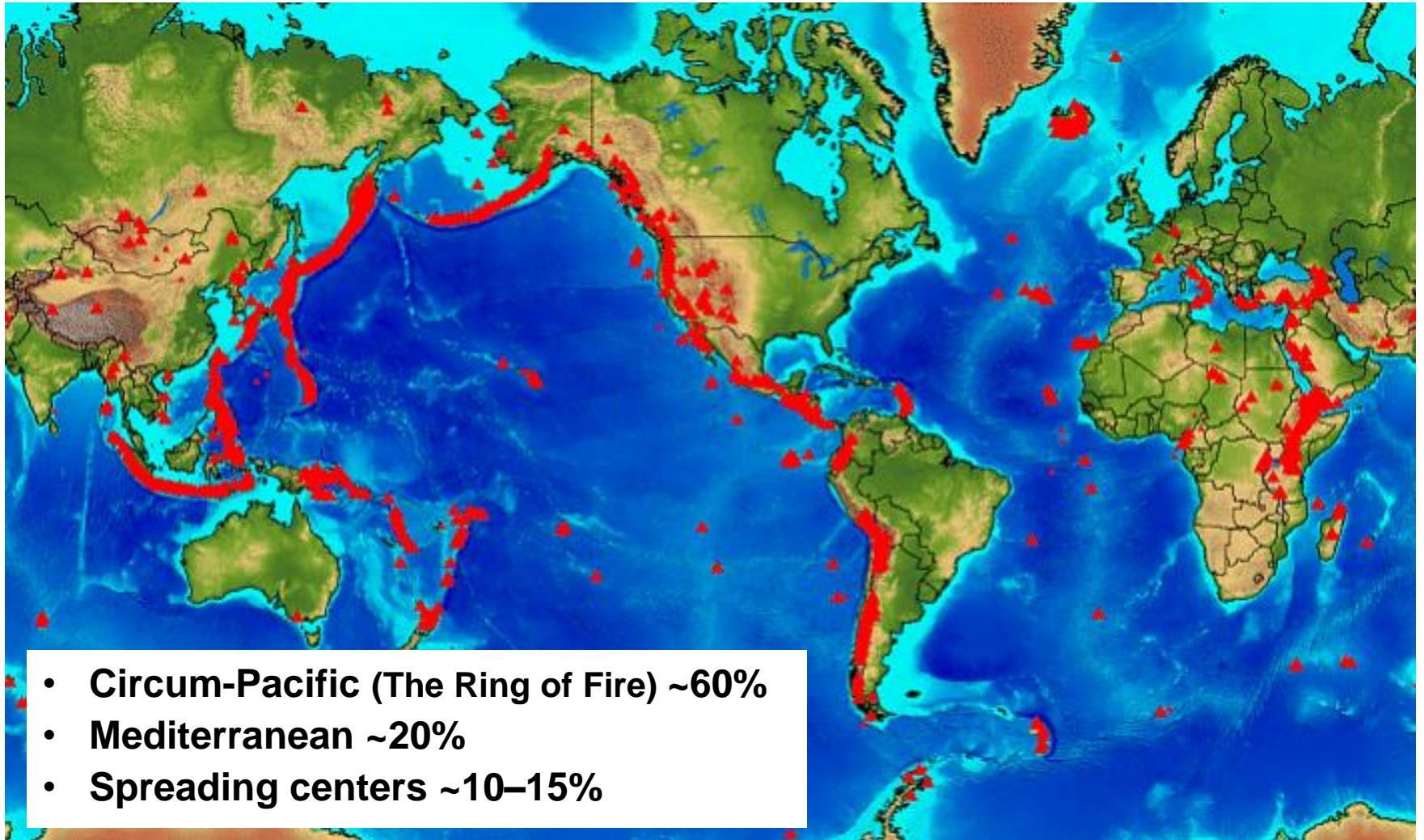
What is a Volcano?

- A volcano is a mountain that forms when **magma reaches the surface** of the Earth.
- Magma is a mixture of molten or semi-molten rock, volatiles (low boiling point substances) and solids that is found beneath the surface of the Earth.
- Magma is less dense than the solid rock around it.
- Magma develops and collects in areas called **magma chambers**. When a structural zone allows movement, magma rises to the surface.



Volcano Distribution

On Earth, volcanoes are generally found where tectonic plates are diverging or converging.



Volcanic Activity

- **Active** - activity present in the last few centuries:
 - Mauna Loa, HI (current)
 - Mt. St. Helens, WA (1980)
- **Dormant** - “quiet” for the last hundreds to thousands of years, but still have potential to erupt:
 - Mt. Elbrus, Russia (~2000 years ago)
- **Extinct** - no eruption in historical times, unlikely to erupt again, no longer have a magma supply:
 - Castle Rock, Edinburgh, Scotland (~350 million years ago)



Volcanic Eruption Types

- **Non-explosive Eruptions**



Lava flow



Lava fountain



- **Explosive Eruptions**

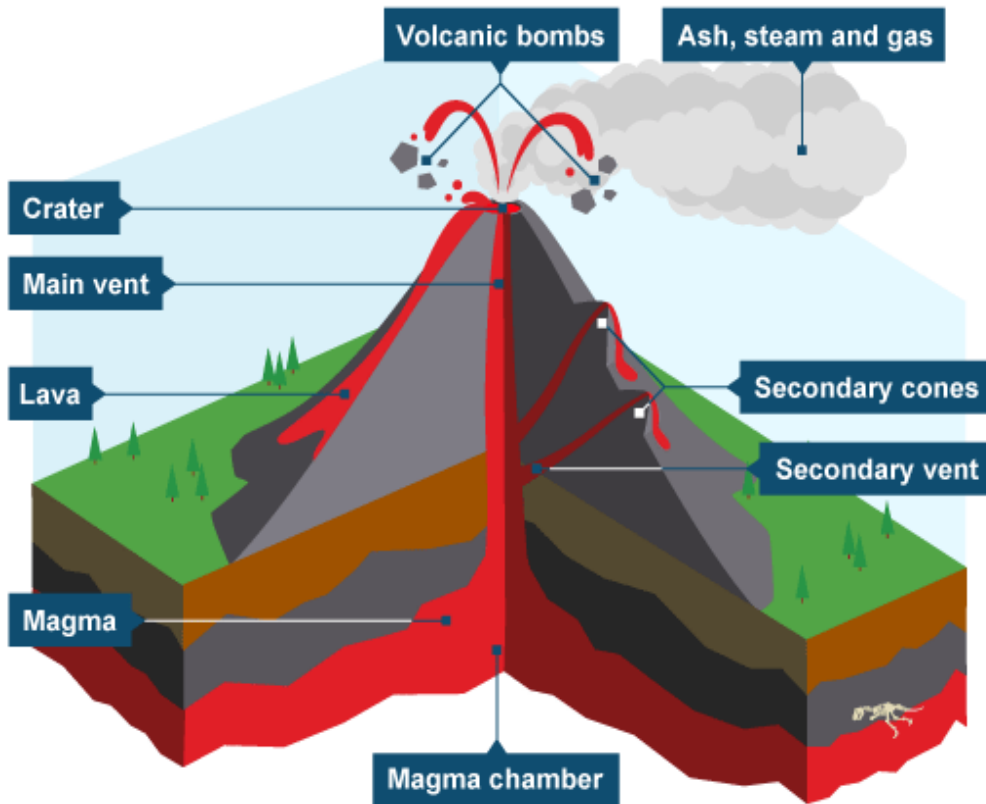


What is *Lava*?

– magma that flows onto the Earth's surface.

Parts of a Volcano

1. VENT - the vent is the opening from which **lava** flows.



Dust, ash, and rock particles can also be thrown out of the vent!

Parts of a Volcano

2. CRATER - the top of the volcano.

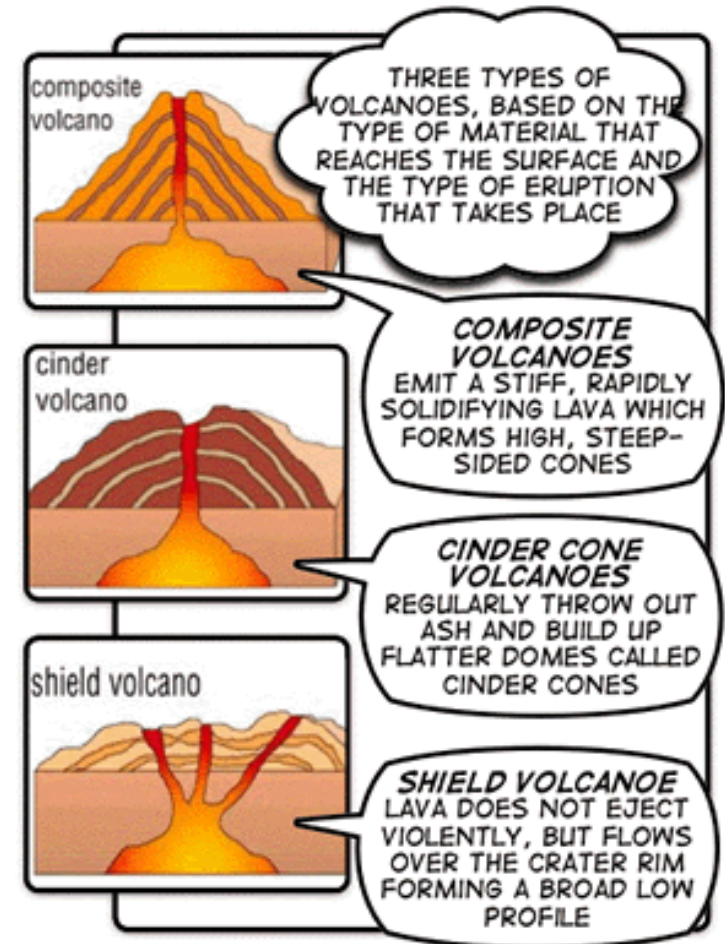


This funnel-shaped pit is formed when the material explodes out of the vent!



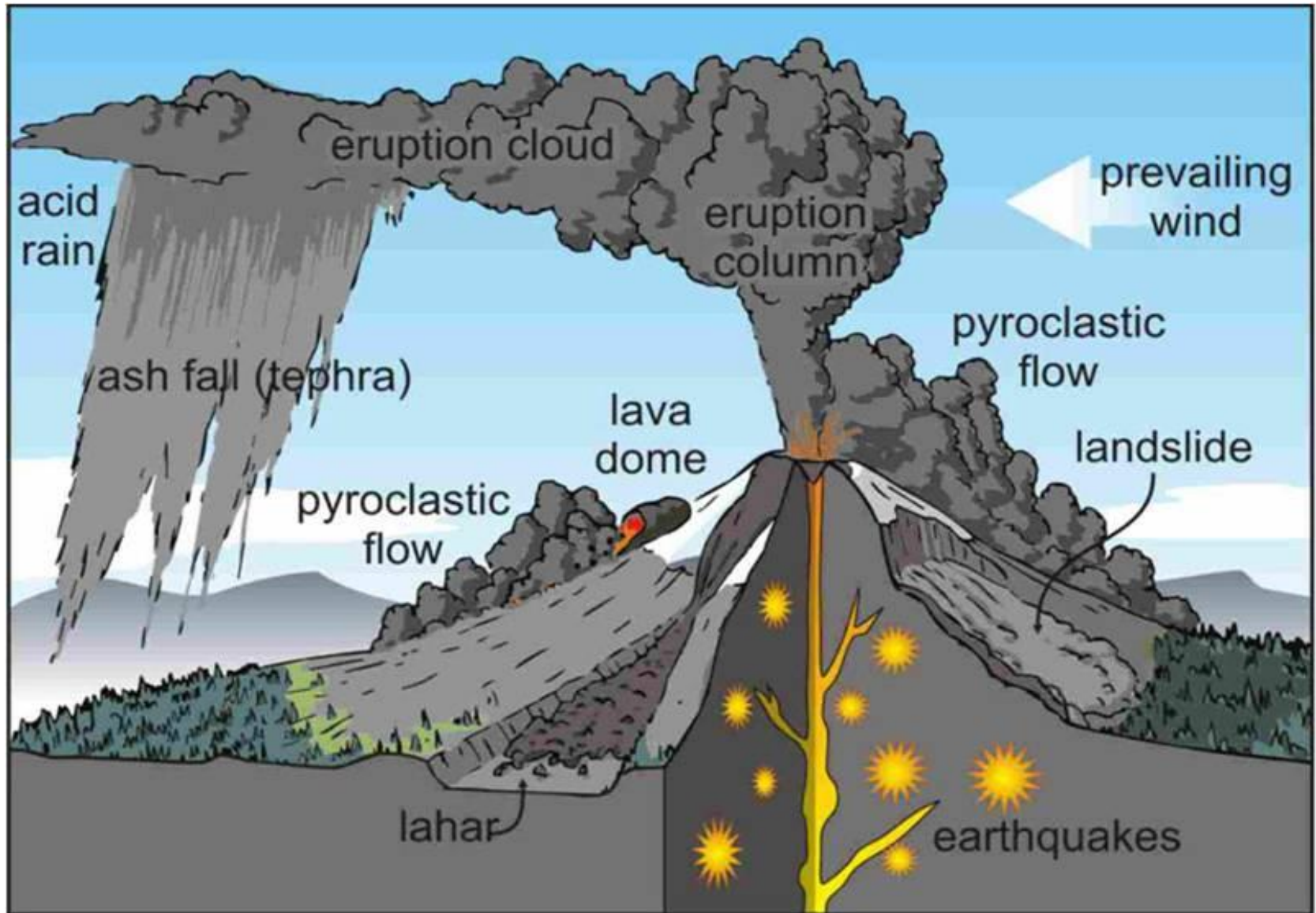
Parts of a Volcano

3. VOLCANIC CONE - the pile of lava, dust, ashes, and rock around the vent.



It can be found in
different shapes!

Volcanic Eruption



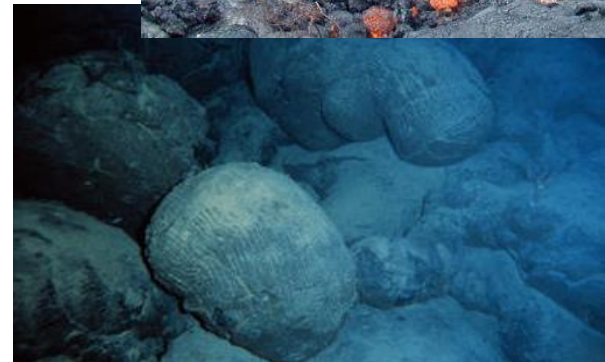
Volcanic Eruption: Primary Effects

- **Three types of material expelled from volcanoes:**
 - **Lava** (“liquid”)
 - **Ash, cinders, bombs** (“solid”)
 - **Gases**
- **An erupting volcano will produce a number of distinct landforms including:**
 - **Volcanic cones**
 - **Flood basalts**
 - **Calderas**

Volcanic Materials: Lava

Lava (“the liquid”) is mostly molten rock:

- Pahoehoe lava - basaltic lava, low viscosity.
- Aa lava (pronounced aa-aa) - basaltic lava, higher viscosity; solidifies flowing, forms angular pieces.
- Pillow lava - lava extruded *underwater*; cools and contracts, forms spherical masses; found at the ocean floor.



Selected Videos

Pahoehoe lava flow, Big Island, Hawaii

<https://www.youtube.com/watch?v=XQVBBdFY8pk>

Lava fountains, Iceland

<https://www.youtube.com/watch?v=fmCJSS2YAP0>

Viscous lava flow, Big Island, Hawaii

<https://www.youtube.com/watch?v=ndB2WRwyK1w>