GCSE Geography Knowledge Organiser – 3.1.1b Volcanic landscapes – Large and small-scale tectonic features

Small-scale features of a tectonic landscape: lava tubes and cinder cones

During an eruption, the surface of a lava flow cools and insulates the lava flow below it. This allows lava to flow far from the volcano's crater. At the end of the eruption, the liquid lava drains away, leaving behind an empty **lava tube**. These are often large enough to walk through and stretch for hundreds of metres.

Cinder cones are the smallest type of volcano. They are made of **scoria (cinders)** erupted in a single eruption from a volcanic vent and can form on their own or on the sides of larger volcanoes.

Large-scale tectonic features: stratovolcanoes, calderas and hotspots

As magma rising from melted oceanic plates at **destructive plate boundaries** has a **high viscosity** (thickness), it tends to **trap gasses**. The lava does not flow easily and tends to create a **steep-sided** volcano called a **stratovolcano**. Gasses cannot escape and build up to create dangerously **explosive eruptions** and **pyroclastic flows**.

Calderas are formed when huge volcanic eruptions empty the **magma chamber** of the volcano and the top of the volcano collapses into the empty space left behind. A huge circular depression is created ranging from a few km in size (in diameter) to over 50 km in the case of the Yellowstone caldera in the USA.

Some volcanoes are caused by **hotspots** and can therefore be found away from plate boundaries. Super-hot plumes of magma melt through the Earth's crust and erupt onto the surface causing volcanoes or volcanic islands, e.g. Hawaii.

Small-scale tectonic features: geysers

In certain volcanic regions, **geothermal** heat can turn water into superheated steam which **expands** in the confining cracks in the ground, creating huge pressures. This forces the steam up through the cracks where it erupts in spectacular **hydrothermal** explosions called **geysers**. Old Faithful in Yellowstone National Park is one of the most famous geysers in the world.

Large-scale tectonic features: shield volcanoes

Magma rising at **hotspots** or constructive plate boundaries tends to have a **low viscosity** (thickness) which allows gasses to escape easily. The lava spreads out across the land forming gently sloping, low-lying **shield** volcanoes.