

## Tectonic Background of Mount Etna

### Living in the shadow of Italy's volcanoes

Mount Etna sits close to a destructive (**subduction**) plate margin where the African plate moving north is subducting beneath the Eurasian plate (Figure 1). However, unlike its near neighbours Stromboli and Vesuvius, Mount Etna does not exhibit the typical characteristics of a subduction margin volcano.

Mount Etna is a broader shield-like volcano that experiences frequent effusive (lava) eruptions. These volcanoes are more commonly associated with constructive margins or 'hot spots'.

#### Figure 1

Plate tectonics and the Italian volcanoes



Image source: DTWE

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### Why do the eruptions of Mount Etna differ from the norm at this plate margin?

Some scientists have suggested that Mount Etna sits on a fault line between the African plate and a small microplate called the Ionian plate. Magma from the mantle is being squeezed towards to the surface to form Mount Etna. Mantle magma is quite different from that produced at a subduction margin. It is much hotter and more fluid, resulting in the lava eruptions that typify Mount Etna.

Another theory suggests that Mount Etna is sitting above a 'window' in the descending African plate where a plume of magma rises up from the mantle below (Figure 2).

### Figure 2

Simplified cross section of the subduction margin



Image source: DTWE

### Questions

1. What type of plate margin is responsible for the Italian volcanoes and which two plates are involved?
2. Explain how and why the eruptions of Mount Etna differ from other volcanoes in the region.