

Earth's Volcanoes Compare and Contrast Answer Key

Earth's Volcanoes

- **Size:** Smaller than those on Mars; Mauna Loa is the largest on Earth but still smaller than Olympus Mons.
- **Eruption Style:** Range from quiet lava flows (shield volcanoes) to explosive eruptions (composite volcanoes).
- **Main Materials:** Lava, ash, gas, rock fragments.
- **Frequency of Activity:** Active, dormant, or extinct; activity varies but many erupt on human timescales.
- **Impact on Surface:** Build islands, mountains, fertile soils, and can cause destruction.

Mars (Olympus Mons & others):

- **Size:** Olympus Mons is the largest volcano in the solar system (about 3 times taller than Mount Everest).
- **Eruption Style:** Likely slow, long-lasting lava flows due to lower gravity and lack of plate tectonics.
- **Main Materials:** Primarily basaltic lava.
- **Frequency of Activity:** Believed to be extinct or dormant; no

known eruptions in recent times.

- **Impact on Surface:** Huge shield volcanoes shape the Martian surface.

Io (alternative focus):

- **Size:** Volcanoes are widespread but not as tall as Olympus Mons.
- **Eruption Style:** Extremely explosive, frequent, and violent due to tidal heating from Jupiter's gravity.
- **Main Materials:** Sulfur, sulfur dioxide, and silicate lava.
- **Frequency of Activity:** Constant eruptions make Io the most volcanically active body in the solar system.
- **Impact on Surface:** Rapidly changing landscape, with new lava flows covering old terrain.

Reflection (Sample Answer):

Io would be the most dangerous to visit because eruptions happen constantly and unpredictably. The extreme environment and Jupiter's radiation also make survival impossible. Mars volcanoes are massive, but since they are dormant, they are less of a hazard today.