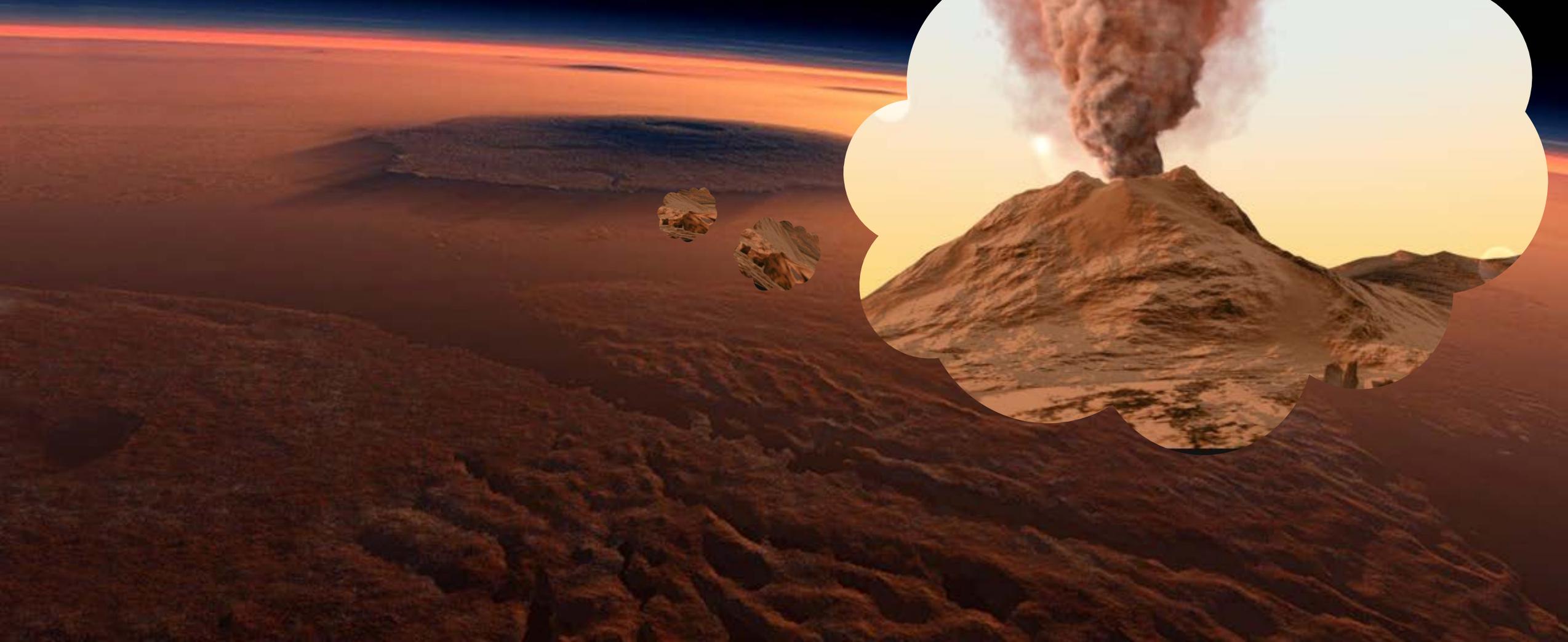


MARS

VOLCANOES ON MARS





VOLCANOES IN THE SOLAR SYSTEM

Volcanoes and/or lava flows are prominent features on all of the large **rocky planetary bodies** in our solar system

Even some **asteroid** fragments show evidence of lava flows

Below are the planets/moons which show evidence of volcanoes ...



Venus



Earth



Mars



Saturn's
moon



Jupiter's
moon



Neptune's
moon

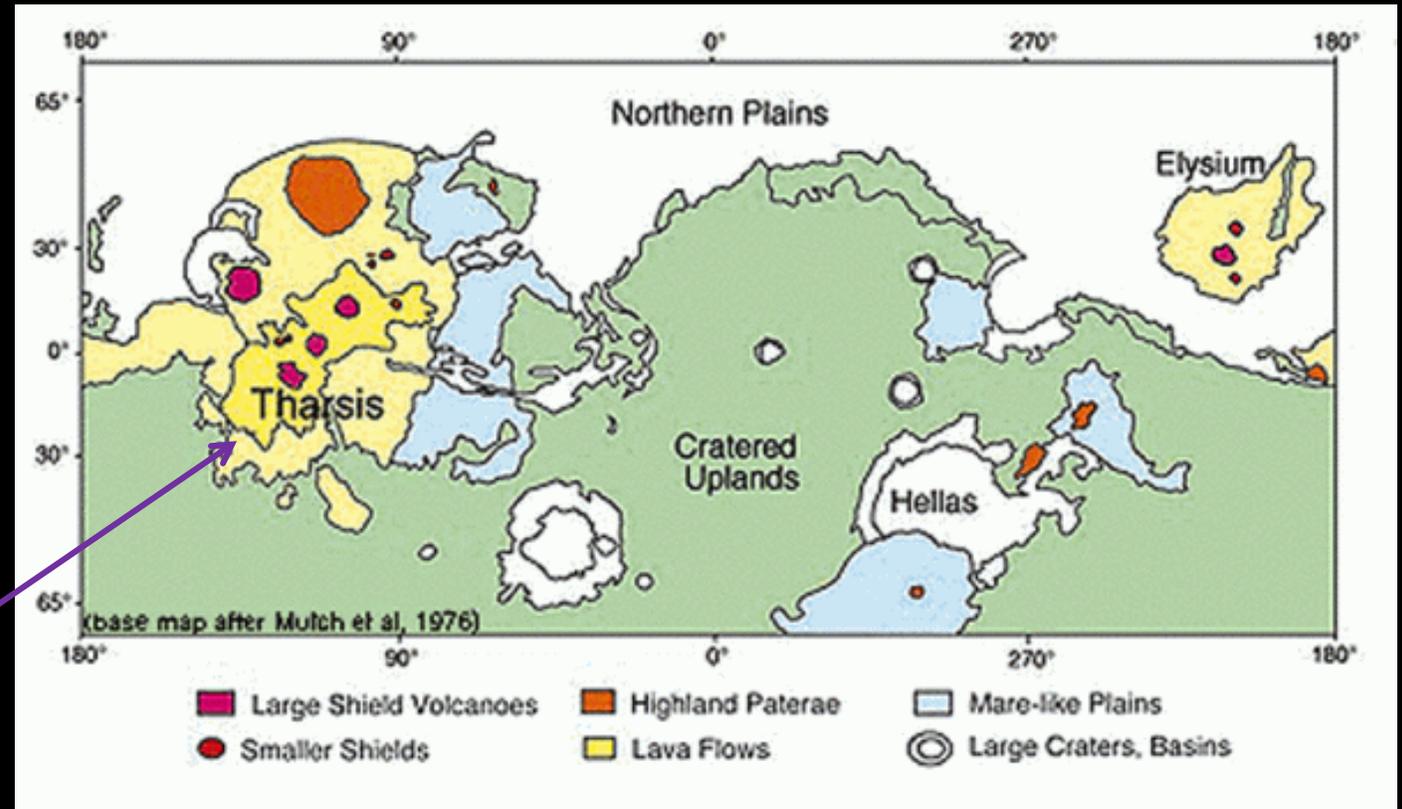


VOLCANOES ON MARS

Volcanism is one of the major geologic processes in the solar system

Mars has a long history of volcanic activity from the ancient volcanic areas of the **southern highlands** ...

...to the more recent (geologically speaking) major volcanoes of the **Tharsis bulge**



LARGEST VOLCANO ON MARS

Olympus Mons is a volcanic mound that towers more than 20 km above the surrounding plains

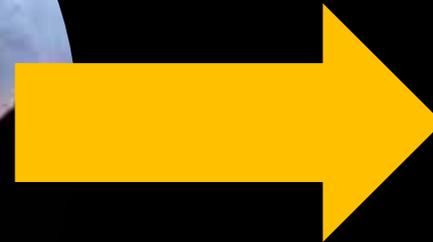
It would cover the entire state of Arizona or the country of Poland!

The formation of Olympus Mons is shown in this animation:

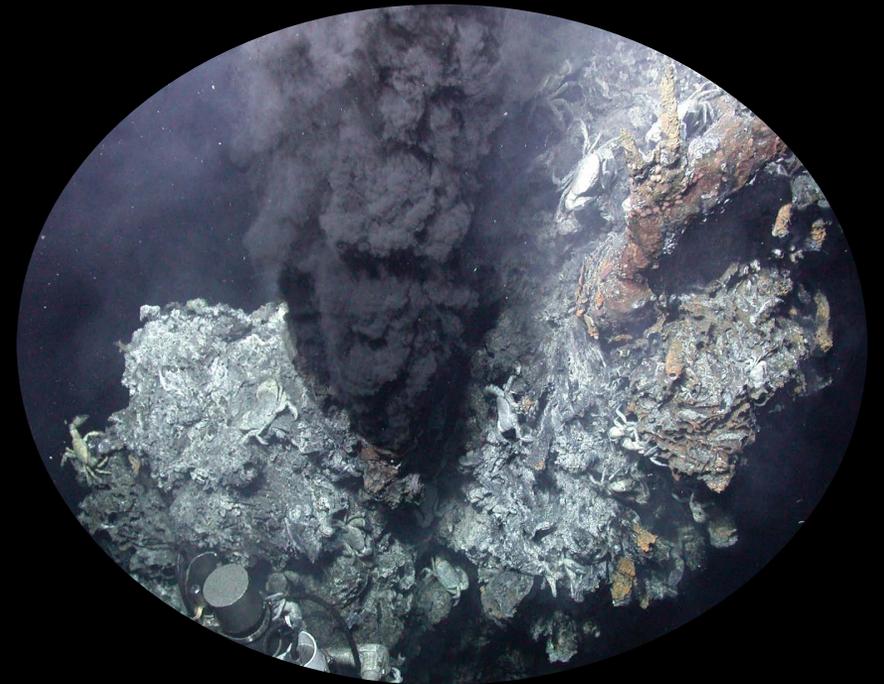


LIFE AROUND VOLCANOES - EARTH

Where volcanic heat & water interact on Earth, scientists are finding life...



BLACK SMOKERS

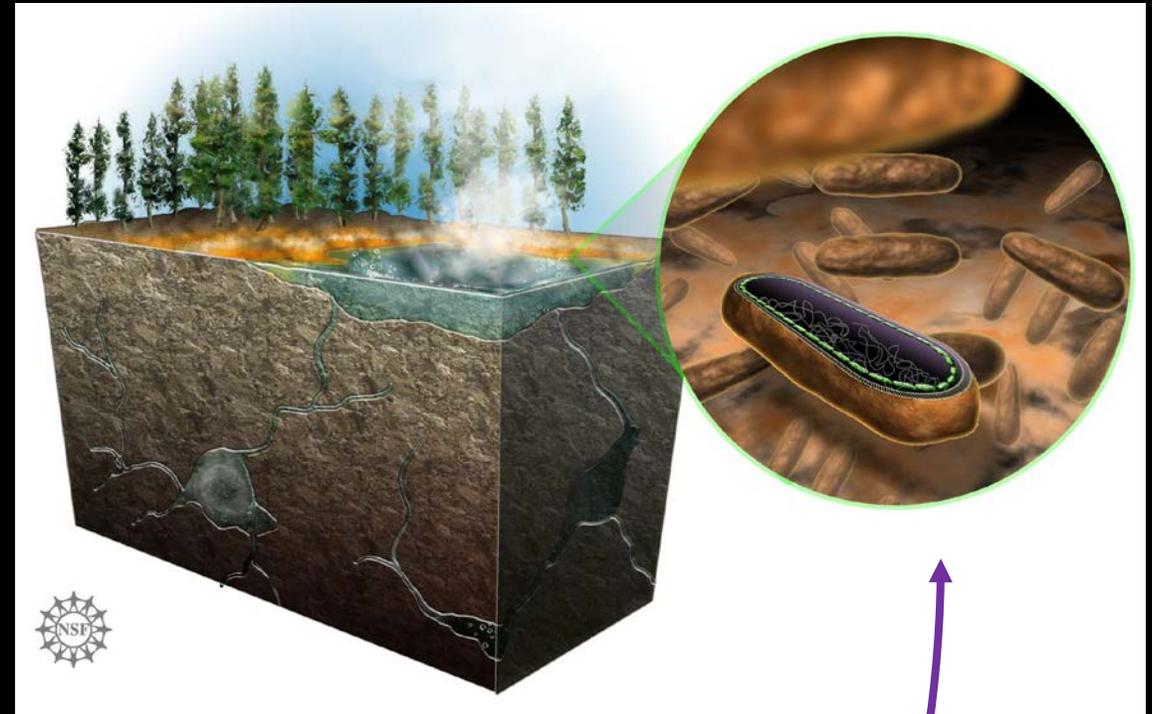


Can you spot the life surrounding these extremely hot volcanic vents?

SMALL LIFE

In the hot springs of Yellowstone Park (a known supervolcano), scientists have found abundant life forms - including some very **small bacteria**

Cryosmallon squamferum
- Also found in hydrothermal vents



Yellowstone Park
- **small bacteria**

MANKIND

Even humans have chosen to locate near volcanoes for many years...

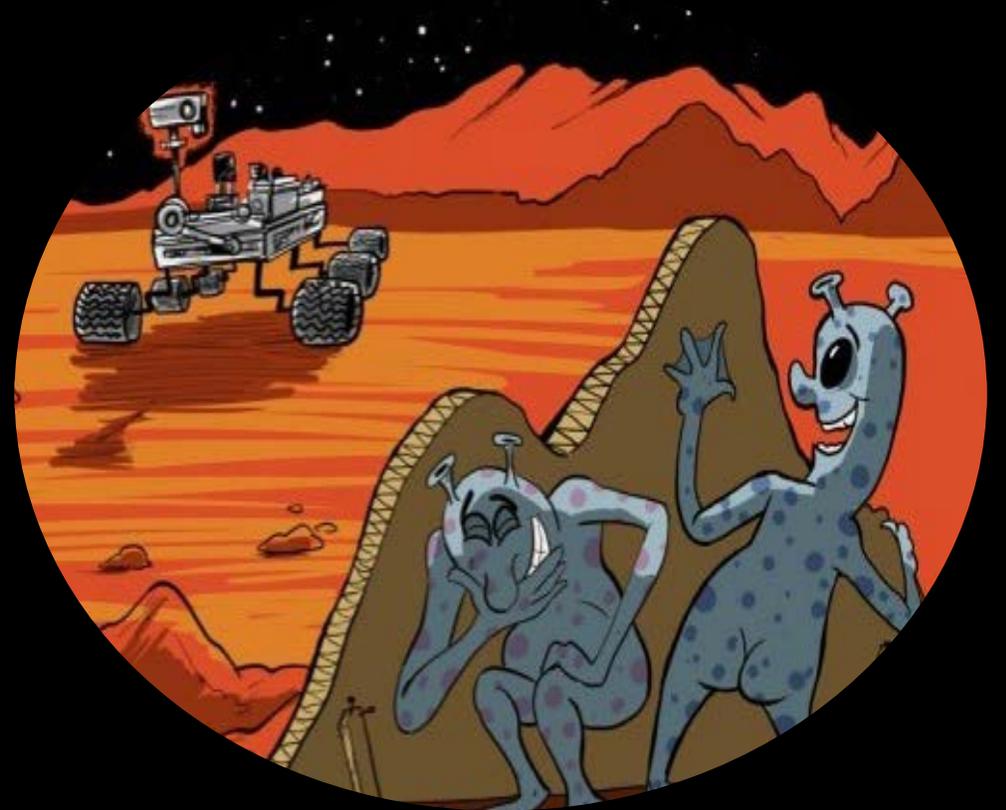
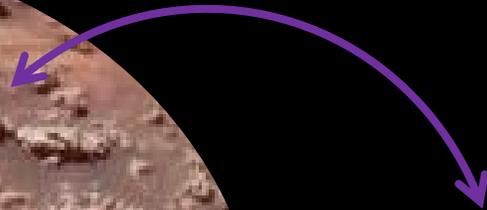


Volcanic soils are naturally fertile and good for growing crops



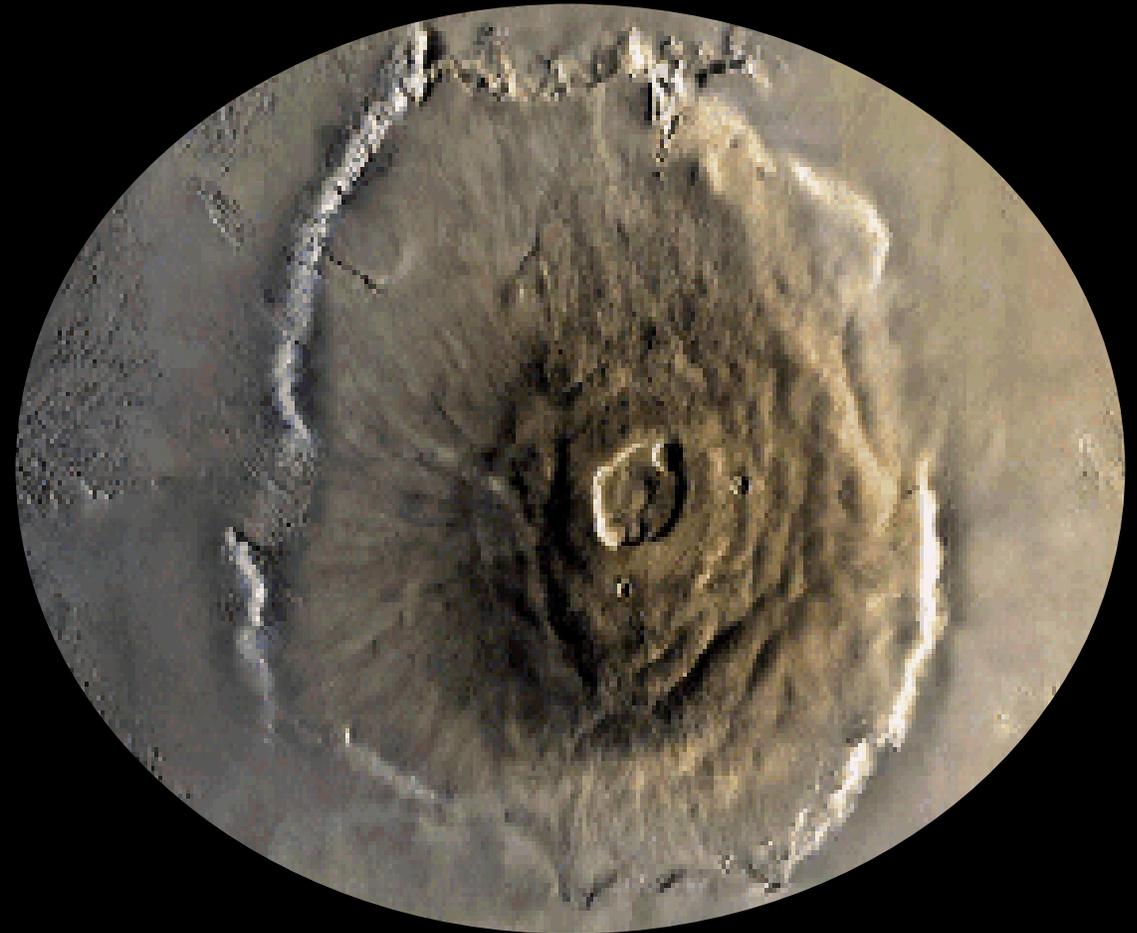
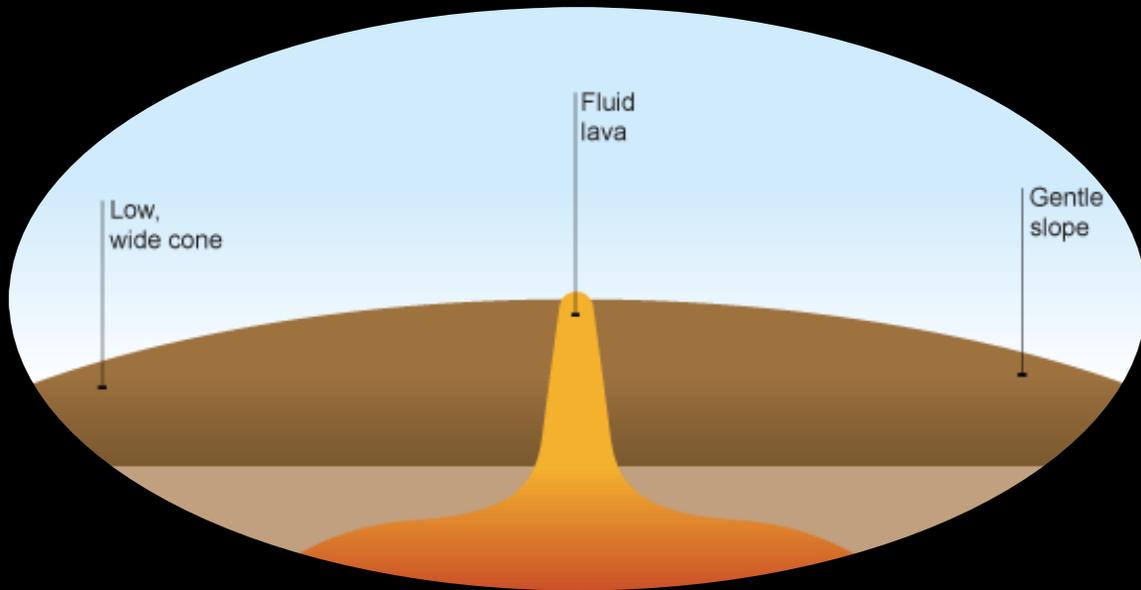
POSSIBLE ON MARS?

It is possible that life may have existed in the ancient volcanic terrains



SHEILD VOLCANOES

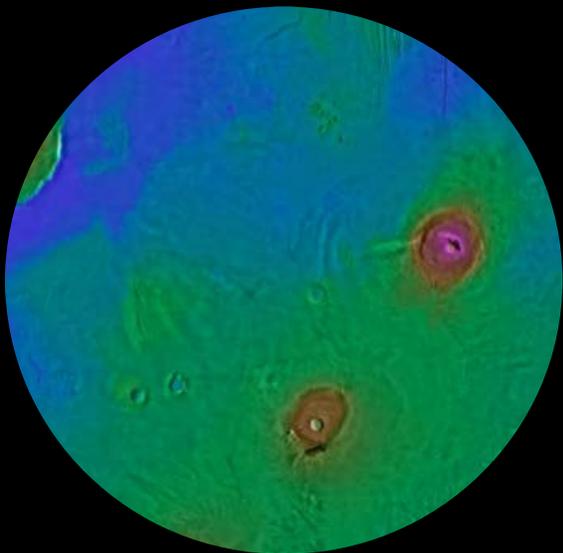
Some of the volcanoes on Mars are **basaltic shield volcanoes** – the same type as found in Hawaii



GEOLOGY

Interpretations of photographs and soil analyses from the Viking and Pathfinder missions indicate that many of the lava flows on Mars are probably the volcanic rock basalt

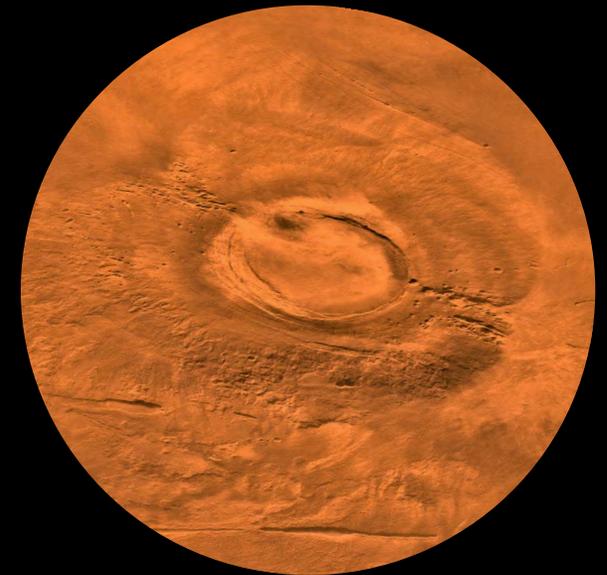
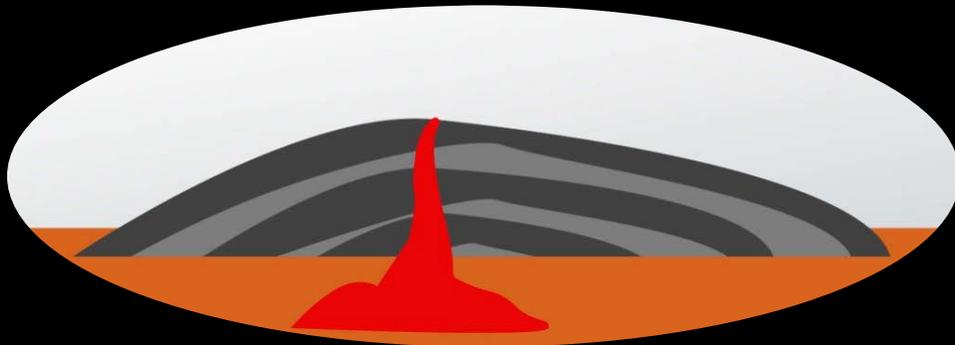
Basalt is very common on Earth, and scientists believe that it is also a common rock type on all the large bodies of the inner solar system



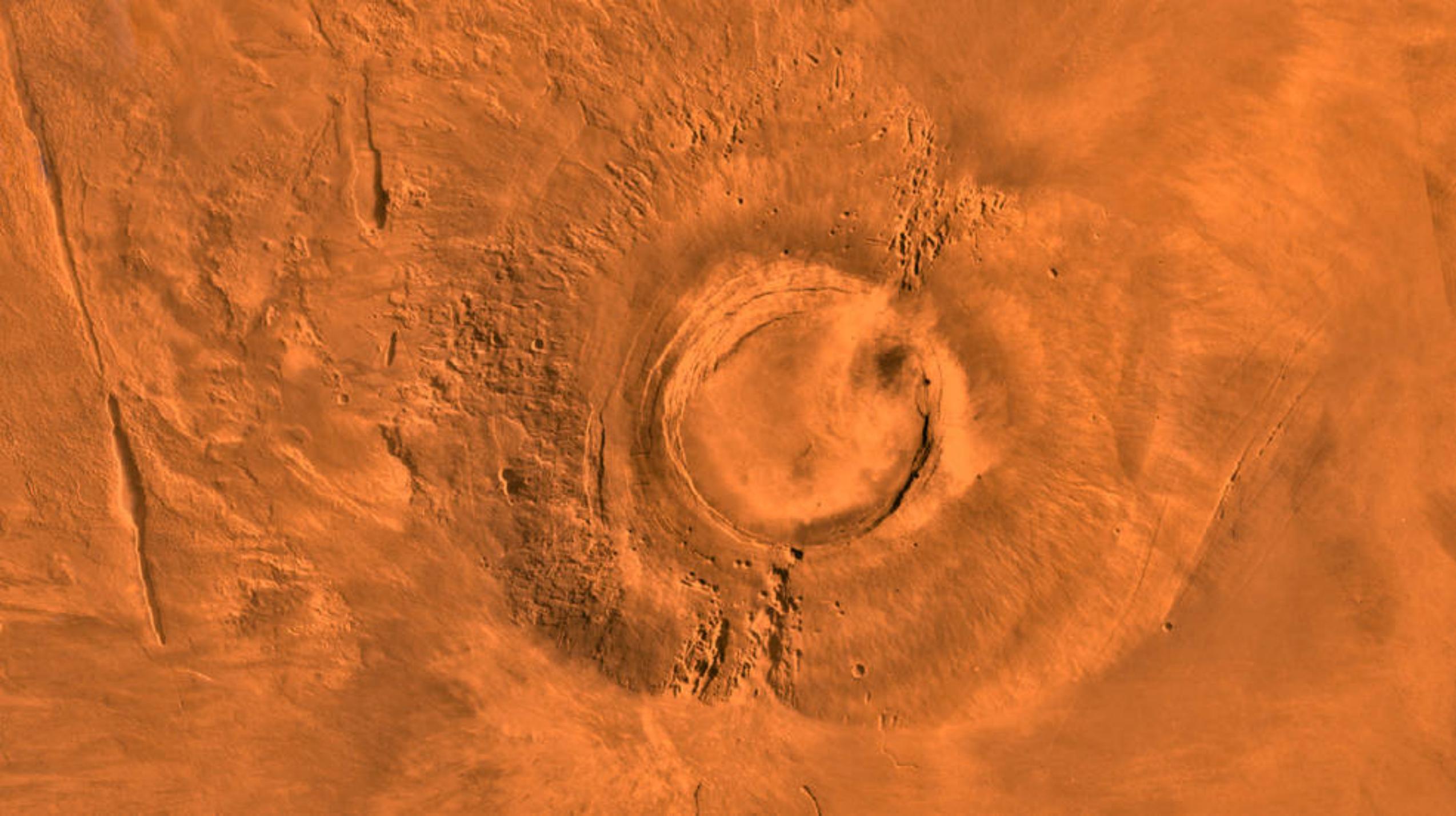
RECENTLY DISCOVERED MARS VOLCANOES

New research reveals that the giant Martian shield volcano **Arsia Mons** produced one new lava flow every **1 to 3 million years**

The last volcanic activity there **ceased** about **50 million years ago** which is after the dinosaurs on Earth became extinct

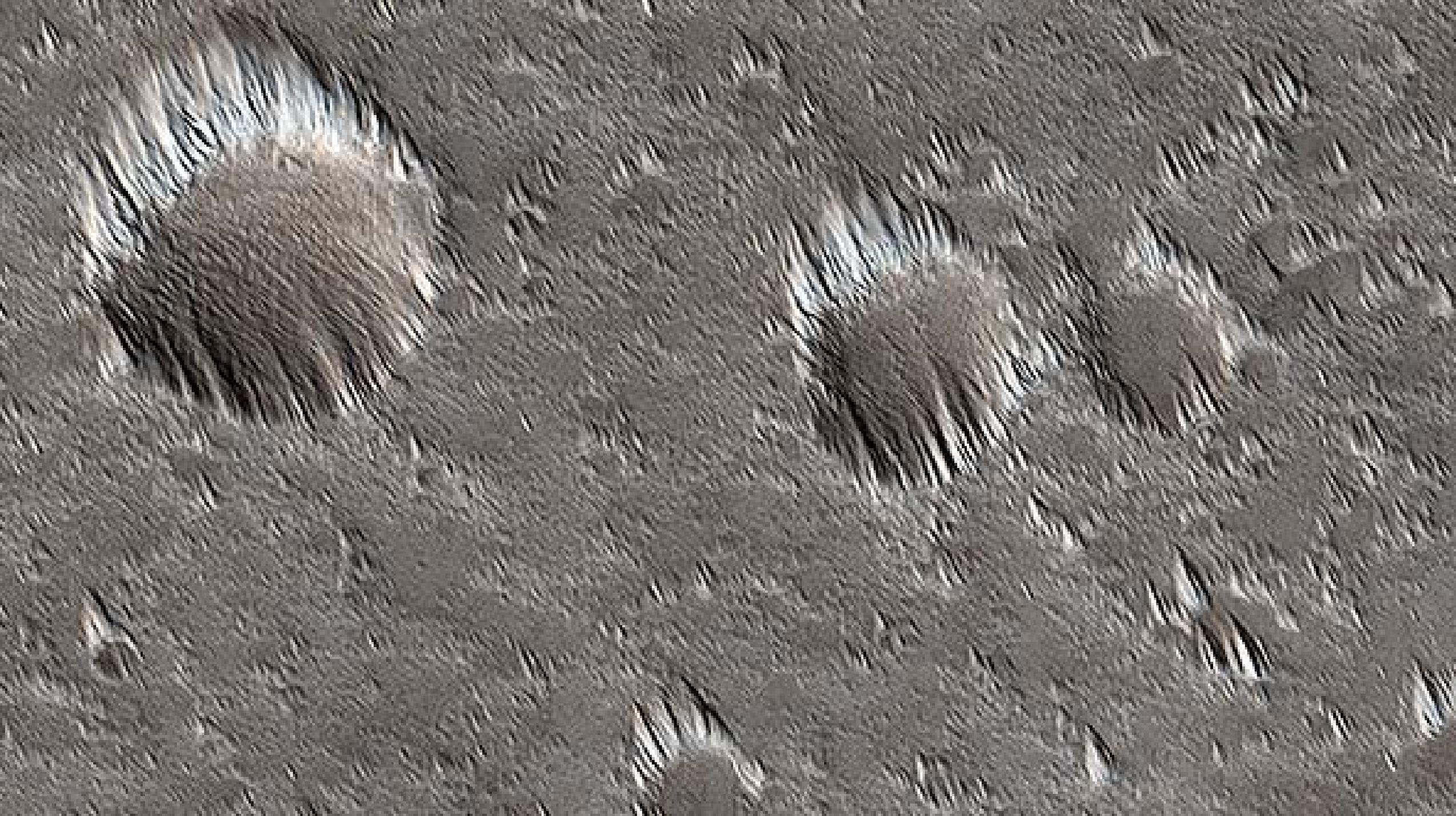


SOME OF THE
INCREDIBLE VOLCANO
HIRISE PHOTOS FROM
PREVIOUS MARS
MISSIONS ...











CREATE YOUR EXPERIMENT

You are going to model the sequence of **lava flows** produced by **multiple volcanic eruptions**

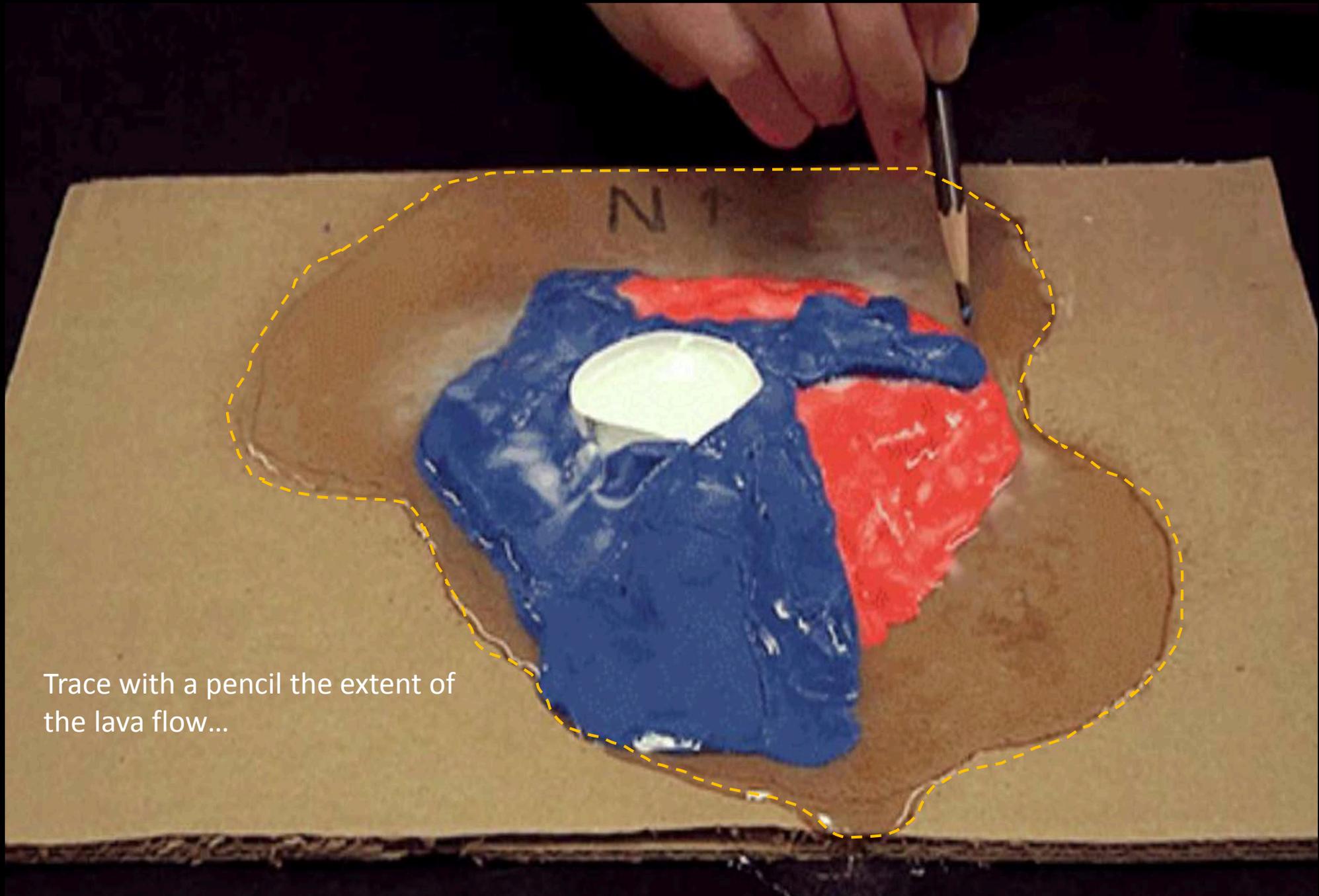
You will need:

- Baking soda
- Vinegar
- Playdough

Different colours identify **different eruption events**

Plastic cup in the centre as the source. Insert the baking soda and vinegar to make the eruption.





Trace with a pencil the extent of the lava flow...

Dry up the surrounding area as best you can...



A hands-on model of a volcano is shown on a piece of brown cardboard. The volcano's cone is made of a textured, reddish-brown material. A white, circular opening at the top represents the crater. Two hands are visible at the top of the frame, one holding the edge of a purple play-dough sheet that is being draped over the volcano's rim. The purple sheet is partially covering the red and blue lava flows. The red flow is on the right side of the volcano, and the blue flow is on the left side. The purple sheet is being held in place by the hands, showing how it would cover the volcano's rim.

Then apply a thin colour of a different play dough. To show the visual extent of the lava flow...

You can see the previous examples. **Red** being the oldest flow and **blue** the second youngest lava flow.

You can have a play taking cores samples of the lava successions using straws ...



Compare your volcanoes with the rest of the class...

You can also map out the different lava flows on a separate piece of paper as you go along....

