Wax Volcano Demonstration

Supplies:

- Hot plate, double boiler, or Bunsen burner
- Large pyrex measuring bowl (with handle) or coffee maker carafe
- Paraffin wax (from the supermarket canning aisle)
- Several crayons for wax color
- Shallow cardboard Box at least 60 cm square and several cm deep
- Waxed paper or freezer paper
- Window screening mesh

Procedure:

- Melt the wax in the pyrex bowl on low heat. (caution, it is flammable, and should be melted slowly. A double boiler is the safest approach but a microwave (with a splatter cover on the bowl) or carefully supervised hot plate will work also). It may take 30 minutes or more. Add several crayons.
- Line the box with waxed paper or freezer paper (wax side up)
- Trim a piece of screening to fit the bottom of the box and place it on top of the wax paper. This will provide a "non-slip" base for the flows, and help remove wax for recycling into another volcano
- When the wax is melted, stir to distribute the coloring.
- Pour the wax VERY SLOWLY into the box in small amounts. A few tablespoons to a quarter cup at a time at a thin trickle works best (at a rate just above a "drip") For a classic central vent volcano, pour at the box center and allow the flows to cool between "eruptions"
- You will probably need to keep the wax heated between eruptions to prevent solidification in the bowl.

NOTES:

It will take several eruptions or flows (perhaps half an hour) to start and establish a central vent and radial flow structure. 60-90 minutes and at least a quart of wax are needed to construct a developed shield volcano, and several hours and 2-3 quarts of wax will make a complex shield with an obvious shield shape and a wide variety of volcanic features. (Split the big volcano projects into several wax batches, or the pyrex bowl will be too heavy to pour with control easily)

If you use several crayons in the same color family (e.g. purple, red, and blue) and do not stir the wax very much the flows will be color stratified from the density differences in the crayon dyes, and the settling in your "magma chamber" (pyrex bowl). This shows magma evolution in a chamber as well as establishing a color gradient between older and younger flows.

A lava lake is usually established early on at the pour point, and can be maintained by consistently adding wax after the lower flow portions solidify, but before the lake cools. To get a collapse caldera, gently blow on the lake to establish a crust, and then pour very slowly to inflate the crust and cause a breakout and deflation (this may take practice)

Show the effects of a moving tectonic plate over a stationary magma source by moving the pour point and creating a line of smaller shields or seamounts. A rough approximation of the Big island of Hawaii (with five vents, and wax colors) can be illustrated this way.

Setting up the experiment in a big metal box or aquarium allows illustrating the effects of water on cooling and how it will create somewhat different volcanoes on the seafloor or under a lake than on dry land.

If you are willing to buy new paraffin for the next demo, sprinkle flour or sand as an absolute age marker for a stratigraphy exercise and cut through the volcano with a hot knife when you are done to show the layering, relative, and absolute ages.

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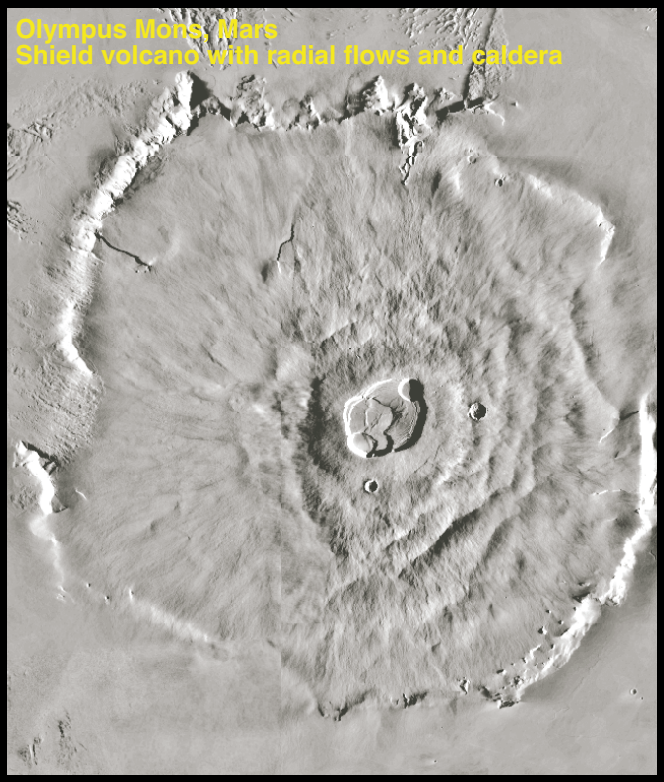
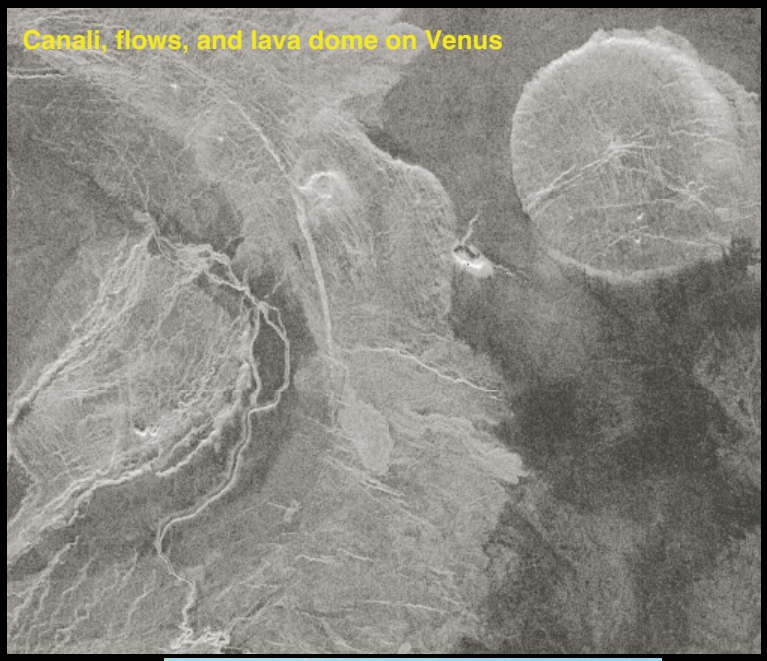
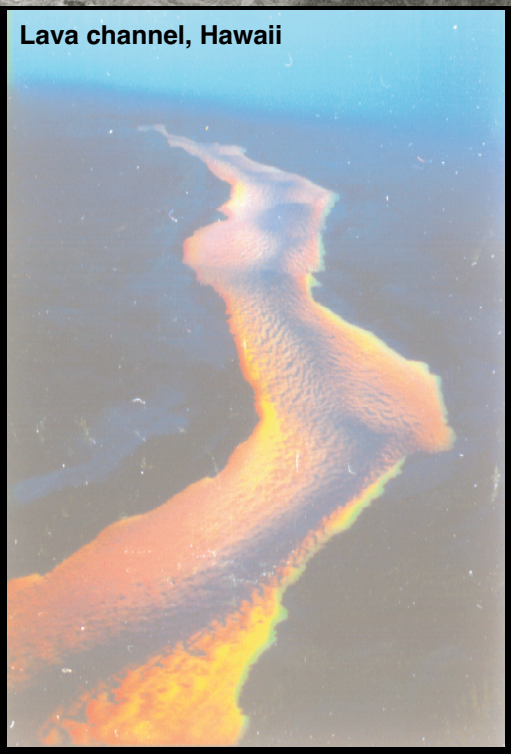
Commonly Created Volcanic Features

- LAVA LAKE/ BREACHED LAVA LAKE
- COLLAPSE CALDERA
- LAVA FLOWS, WITH STEEPER MARGINS, LOBATE (CURVED) FLOW FRONTS
- KIPUKA (older terrain surrounded by younger flows)
- LAVA CHANNELS
- SHIELD VOLCANO SHAPE WITH RADIAL FLOW STRUCTURE







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