HAWAIIAN LAVA FLOWS

Lava flows: ‘ā’ā and pāhoehoe

From *Hawaiian Dictionary* by M.K. Pukui & S.H. Elbert

‘ā’ā: 1. To burn, blaze, glow; fire; staring, as eyes, angry, fury.
   e.g. Ua ‘a’ā ia au i ke aloha (I burn with love)
2. Stony, abounding with ‘ā’ā lava.

pāhoehoe: 1. Smooth, unbroken type of lava.
2. Satin.
3. To drive fish into a net by beating the paddles rhythmically against the canoe.

These two types of flow are identical *chemically* (what they’re made of).
Their differences are due to different emplacement processes (how the lava flows out of the volcano) - flow rates, cooling rates, etc.

Pāhūhū: to gush, ooze forth.
Ho’opōhaku: to harden, as lava

(Courtesy of Ululani Makue)

Lava flows: ‘ā’ā and pāhoehoe

‘ā’ā flows on the north flank of Mauna Loa

Wave-cut cliff section, Makapu’u, O’ahu

‘ā’ā flows
When moving, the incandescent interior deforms fluidly (the glowing lava inside breaks apart and cools as it flows). The top surface is relatively small, spiny clinkers.

Distal-type 'aʻā flows

Standard geologists for scale.

Air photo of the distal end of the 1942 Mauna Loa flow

Three relatively thin 'aʻā flows in cross section

Pāhoehoe flows
Flow field of pāhoehoe "toes" (individual flow units)

Pāhoehoe issuing from a crack in a previous toe

Old pāhoehoe flows in cliff section, Kaua‘i

'Olelo no‘eau involving lava
(from M. K. Pukui; compiled by Ululani Makue)

O ka lā ko luna, o ka pāhoehoe ko lalo. The sun above, the smooth lava below. Said of a journey in which the traveler suffers the heat of the sun above and the reflected heat from the lava below (a difficult trip).

Kikē kaʻala, uwē ka māmane. When the boulders clash, the māmane tree weeps. Meaning that when two people fight, those that are dear to them often weep.

Volcano activity:
Upward Bound students at LCC, summer 2008

- Paper cup with it’s top cut off = "volcano"
- "volcano" is taped around the bottom to cardboard
- Baking soda & Alka Seltzer is put in cup
- Vinegar w/gelatin is poured into volcano
  - "Eruption" occurs
- Extent of eruption is marked with a pen
  - Then filled in with Play-doh
- Multiple eruptions are generated
Students preparing for volcano demo:

- Cutting paper cup
- Crushing AlkaSeltzer

Student adds Alka Seltzer to baking soda for added "explosivity"

"volcano" with tape around the bottom to prevent/minimize leaking

Vinegar added to the baking soda/Alka Seltzer mix
Plah-doh marks the extent of the "lava flow"

A second eruption is generated, and overlays the 1st

A third lava flow - note yellow play-doh, representing the 2nd lava flow.

You can take a "core" of the lava flows using a straw.