



Gelatin Volcano

Source: University of Hawaii

http://www.spacegrant.hawaii.edu/class_acts/GelVol.html

With the use of gelatin and coloured water to emulate dike-forming magma, students can learn about magma movement and volcanic landforms in a fun, hands-on—and edible—way!

Materials

Unflavoured gelatin, 4 packages (28 gm)

Water

Bowls or bread pans, one 2-litre or set of smaller sizes

Red food colouring

Plastic syringe (available at pet stores)

Spoon

Large knife

Pegboard, 40 x 60 cm, with 5-mm holes 2.5 cm apart

Two bricks, 30 cm high

Tray for catching drips

Rubber gloves (optional)



Procedure

1. Prepare the volcano model by mixing the gelatin with two cups of cool water in a large bowl. Stir for 30 seconds. Add 6 cups of boiling water and stir until gelatin is dissolved. Transfer mixture to a 2-litre bowl, smaller bowls, or bread pans. Refrigerate at least 3 hours or until set.
2. Prepare "magma" by mixing water with enough red food coloring to make a very dark liquid.
3. Once the gelatin is set, loosen it by dipping the bowl briefly into a larger bowl of hot water.
4. Transfer the gelatin upside-down to the centre of the pegboard and lift off the bowl. The gelatin cast will settle somewhat after being removed from the bowl. It should resemble a colourless to milky, shimmering volcano. There should be no cracks in the gelatin, but it's OK to proceed if one develops during unmolding.
5. Place the pegboard on top of the two bricks.
6. Fill a syringe with red water. Remove air bubbles from the syringe by holding it upright and squirting out a small amount of water. Air tends to fracture the gelatin.

7. Predict what will happen when red water is injected into the gelatin cast. What direction will it go? What shape will it take? Will it erupt through the surface of the gelatin? If so, where?
8. Insert the syringe through a hole in the pegboard into the centre of the gelatin cast. Inject the red water slowly, at a rate of about 20 cc/minute, and watch carefully.
9. Describe how the experimental results compare with your predictions.
10. Refill and insert the syringe as many times as possible. Compare magma migration each time. Are there differences in the direction the magma takes when the syringe is inserted?
11. Looking directly down on the gelatin cast, sketch the positions and shapes of the magma bodies. Label your drawing "Map View."
12. Use a sharp knife to cut through the gelatin cast. Separate the pieces and examine the cut surfaces. Note the traces made by the magma bodies; these are similar to what we see in highway road cuts or cliff faces.
13. Sketch the positions and shapes of the magma bodies on a cut face. Label your drawing "Cross-sectional View."
14. Compare what you see in two dimensions on the cut face with what you see in three dimensions looking into the gelatin cast. Which view gives you more information? Why?
15. How and why does magma move through volcanoes?