

The use of “sieve models” in introductory geological mapping

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The “sieve model” is an innovative device which demonstrates the interrelationships of surface topography and the outcrop patterns of subsurface geological contacts, and

greatly facilitates a student’s understanding of “dip and strike” in rock layers.

Sieve models are constructed from simple eight inch

diameter kitchen sieves or strainers. The wire mesh surface represents the surface of an almost hemispherical hill. Contour lines can be represented on this surface by means of coloured threads sewn into the mesh.

The "strike lines" depicting contours on the surface of the rock layers are represented in the models by straight pieces of stout wire (cut from coat hangers) which are pushed through the sieve and protrude from each side of it. The wires are pushed through at the levels of the contours (and are thus essentially structure contours on the bed being represented). These strike lines can thus be seen running right through the model and appearing (in space) on the other side. The strike lines can be labelled with their elevation (as can the topographic contours). The addition of heavy card of Bristol Board can make the labelling of strike lines easier and aid in the visualizing of the bed surfaces or contacts, etc. The cards can be inside or outside the sieve.

The use of different coloured wires for the strike lines on the upper and lower surfaces of a bed will also help one visualize the bed of rock and can be easily correlated with

the map problems done in the laboratory. (Coloured vinyl-coated coat hangers provide suitable material for the strike lines.)

The orientation of the rock surface or contact in space is thus not only readily observed, but is measurable both with regard to the "dip" (amount of inclination from the horizontal) and with respect to the compass direction. (n.b. The sieve handle acts as a convenient, ready-made North Arrow, while the wire mesh itself can rotate through 360° within its frame demonstrating numerous problem options for any particular set of strike lines used.)

Used along with an overhead projector, the sieve model's contours and strike lines can be projected on a screen to represent the "map view" of the interrelationship of the strike lines and contours which the students can readily see in the three dimensions in the model itself. The sieve model is not restricted to the representation of a simple hill but can, if inverted, represent a hollow or depression and can be used to demonstrate the behaviour of geological surfaces intersecting a depression.