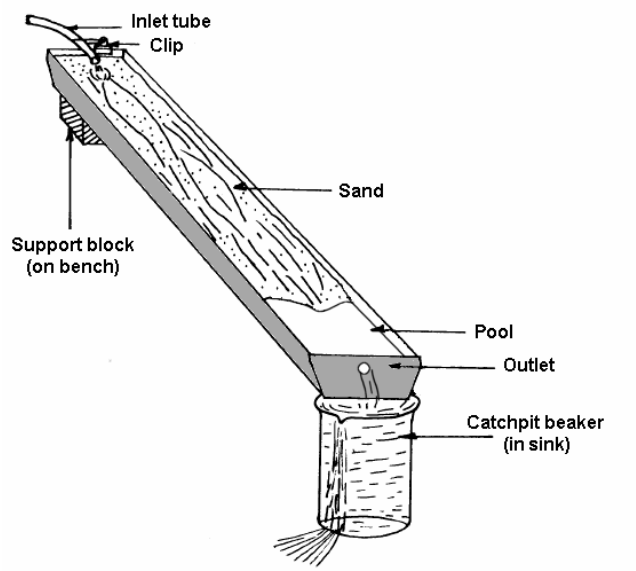
Transport and deposition by a stream

Context & Aim:
Transport and deposition of sediment is best understood by seeing the processes in action. They can be demonstrated easily to small groups in a laboratory using a simple "stream table" made with plastic guttering (see below). A good way to approach this experiment is to set up and run the demonstration during a lesson in which students have another (related) task, so that pairs or groups of four can observe and discuss the demonstration in turn.
For further background, see web pages on Transport and deposition.

Requirements:



You need a 1m (approx) length of gutter with two stop ends. This should be filled about $^{2}/_{3}$ full of damp sand (e.g. washed builders' sand) along about $^{3}/_{4}$ of its length. Mount one end on a wood block (or similar), with the other end over the sink. It is a good idea to drill an outlet hole in the lower end-stop; a beaker in the sink can also provide a catch-pit for any escaping sand.

Set up a rubber tube (possibly with a Hoffman clip) to supply a trickle of water from the tap to the sand at the top of the gutter.

Procedure:
The apparatus should be set up and working in advance. Some practice will be needed to adjust the flow to a suitable trickle that just moves the sand grains along but does not flood the sand surface. It may be useful to start by impressing a straight channel in the sand with a half-metre rule – you may be surprised at how quickly the "stream" channel begins to change course.
Students' attention can be drawn to the way in which grains are rolled along; larger grains may be pushed by the impacts of smaller ones, or may form obstructions that cause the channel to change course.
Where the channel flows into the pool the grains are deposited rapidly as the flow slows down and, over time, deposition begins to build up a Micro-delta. Again, students' attention can be drawn to this through suitable questioning. Over time, the region of delta deposition changes as the channels become choked.

Follow-up: Students may be asked to provide a written description or asked to find out more about large scale river deltas (such as the Mississippi, Nile, or Ganges-Brahmaputra) and the hazards/benefits of living in such places.