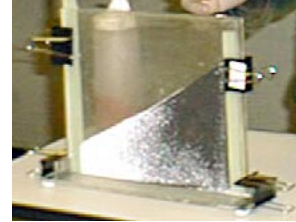


## Building The Hele-Shaw Cell

In Stratification And Segregation: Why Does Some Sandstone Have Stripes? Hernán Makse shows how sand grains of different sizes and shapes may naturally separate after being thoroughly mixed together. He uses a device he built called a "quasi-two dimensional vertical Hele-Shaw cell." You can build one yourself and try some the experiments that Hernán demonstrated.



The cell can be built of acrylic sheet, commonly referred to a Plexiglas®. The dimensions do not have to be exact. The cell pictured here is made of Plexiglas sheets that are about 3 millimeters thick. They should not be much thinner because they will bend too easily, but they may be thicker.

### Tools & Materials

- 3 millimeter sheet of acrylic
- 4 binder clamps
- Grains of a variety of sizes and colors

### The Experiment

Here's what to do:

1. Cut the sides out of the Plexiglas with two tabs on one end so that they may be clamped to the bottom with large paper clips (see pattern at right).
2. Cut the bottom out of Plexiglas.
3. Cut spacers for the sides from Plexiglas or cardboard.
4. Separate the sides with strips of cardboard or Plexiglas placed between them at the left and right edges and clamp together. The spacers should create a space between the sides of about 4 or 5 cm.
5. Position the bottom piece below the sidepieces.
6. Clamp the bottom to the side assembly.



The two sides of the cell each look like this. They should be about 20 to 30 centimeters wide and about the same height



The bottom looks like this.

There are many other ways to build the apparatus. The basic idea is to have two parallel sheets of rigid, clear material separated to be a few millimeters apart. The granular mixture is poured between the two sheets.



To use the Hele-Shaw cell, just pour a mixture of grains into the space between the sides as Hernán is doing in this picture. He is using a plastic bottle with a narrow spout to make it easier to get the mixture into the cell.

The red grains are cubical pieces of sugar that were obtained in the baking section of a local supermarket. They are usually used to decorate cakes. The white grains are sand that may be obtained at a pet store that sells aquarium supplies.

The shapes and sizes of the two kinds of grains make a difference. How fast you pour the mixture into the cell may also affect the results. Try different granular mixtures and see what happens. Take pictures and send us your results.

Note: You can purchase A Grain of Truth: Formation of Sandstone, a kit with the Hele-Shaw cell already built from:

Science Kit & Boreal Laboratories  
777 East Park Drive  
PO Box 5003  
Tonowanda NY 14151-5003  
USA  
Telephone: 800 828 7777  
FAX: 800 828 3299  
email: [sk@sciencekit.com](mailto:sk@sciencekit.com)  
Web: <http://www.sciencekit.com/>

The kit includes sandstone samples, the Hele-Shaw cell and other materials and equipment needed to perform the experiment described above. The ordering number for the kit is 47079-00. The price is US\$32.50