

# Soil Columns

## Teacher Instructions for Clay Column Demonstration

*It takes much longer for water to move through the clay column than it will for the sand and silt columns. To provide an opportunity for students to observe the clay column, you will need to prepare it in advance as a class demonstration. Prepare at least one column with clay as a demonstration to use in each class. You may want to prepare multiple clay columns that you can start at different times of day so that students can see them at different stages and to obtain multiple data points.*

### Preparing the Clay:

- You should start preparation of the clay 1-2 weeks before beginning this lesson. This procedure assumes that you will start with moist clay, which needs to dry, and then be pulverized to a powder. To prepare the clay, break the moist clay into small chunks and cover with water. Allow to sit for a few days until the clay forms a homogeneous “slurry.” Then pour onto a flat surface (such as a parchment-lined cookie sheet) so that it forms a thin layer and allow the clay to dry. When dry, place the pieces into heavy-duty zip-closure plastic bags with excess air squeezed out (you may want to double bag). Then use a heavy bottle or rolling pin (or other heavy item) to grind the clay into a powder. This process does not require a lot of “hands-on” time, but it will take some time for the clay to break down into a smooth slurry and then to dry. The benefit of this process is that you can easily get thin sheets of dry clay that are easier to grind into a fine, more uniform powder for use in the columns.

### Tips:

- Practice preparing a column according to the diagram and instructions on the student handout, *Water and Soil Properties*.
- Practice adding water and timing the columns so you will be prepared to answer students’ questions. For practice, you may want to start with sand and then move to baby powder and then clay. Using the pipet to add water can help minimize disruption of the column (especially for baby powder and clay).

**Teacher note:** The layer of sand at the bottom of each straw improved the experimental results. Without that layer, the coffee filter seemed to clog with either clay or baby powder and blocked all water drainage. Students should be as consistent with that bottom layer as possible.



PHOTOGRAPH OF A COLUMN SETUP USING BABY POWDER AS A SUBSTITUTE FOR SILT. THIS COLUMN IS READY FOR WATER TO BE ADDED.