Fully Portable Gravity Powered Stream Table

This stream table can be assembled for under $100. It consists of:

- plywood box base
- galvanized sheet metal liner
- ground walnut shells
- short sections of 2X4
- a short step stool
- plastic tubing
- plastic buckets
- plastic drain valve
- metal coffee cans
- various washers and nuts
- epoxy glue
- a dust pan/flat scoop
- toys
- and water

The operation is simple. Water is siphoned out of the top bucket and flows through the ground walnut shells and down into the lower bucket. When the material (ground walnut shells) is first being wet, sheet erosion and overland flow can be discussed. Stream channel features (point bars, headcuts, mid channel bars, etc) begin to form once the material is wet. Continuous flow can be obtained by ladling water from the lower bucket (that also collects the sediment) back to the top bucket using a coffee can.

As in all things it is the details that make the difference. Starting at the top of the system, the siphon tube intake is weighted down using washers and nuts that have been epoxied together. The weight is designed to hold the intake of the tube parallel and near to the bottom of the bucket.

The intake end of the tube has been heated and fared to secure it into the weight

The lower end of the siphon tube is mounted in metal salvaged from a coffee can that has been secured to the base box by wedging it into a slot made by another strip of coffee can material.

The plastic valve allows for the siphon to be maintained and the water to be quickly shut off. The camper and trailer repair section of most hardware stores should have something that will do. The size of the plastic tubing will be determined by the size of the valve

Material other than ground walnut shells can be used to simulate soil but like walnut shells should be easily cleaned and stored for future use. Walnut shells are available on the internet or from many sand blasting companies. They are also used to polish metal and may be available through ammunition reloading suppliers.

Various items can be added to the stream table to draw attention to specific features or processes. The objects can differ depending on the audience. This, for example, is Fred. Fred is from the planet Hydro and has come to earth to watch streams. He is often placed by an eroding outside bank creating anticipation as to when he might fall in.

Vegetation can be simulated using Christmas garland. The effects of vegetation removal can be simulated by removing the garland once a channel has been established next to it.

Small toys may also be used to create different scales and to draw people into playing. If you can get someone playing with the stream table then you have their attention.

The lower end of the stream table consists of a single drain. Often a headcut will form just up stream of the drain and provide many opportunities for discussion of stream channel functions.
The metal pan liner is the most expensive part of this system. It was added after it was discovered that even a good paint job will decompose under a stream of water and walnut shells.

This type of stream table has several advantages. It is portable and does not require anything other than a table to set it up on. The need to periodically refill the upper bucket from the lower bucket can be used to involve your audience and also to create a pause in the presentation to allow people to move about and ask questions.

Clean up consists of

- adding a thicker wedge to the upper end of the box, to allow the water to drain out,
- scooping the walnut shells into a pile, to allow them to drain more freely,
- draining the water off the accumulated sediment in the buckets,
- scooping the walnut shells into one of the buckets (A dust pan works well for this.), and
- hauling everything back to storage (Walnut shells will decompose if left wet. It is best to spread them out and let them dry prior to long term storage).

This is just one idea. Adapt it to your needs