STREAM TABLES -- TEACHER NOTES

As you look through the five activities on stream tables, you may wish to consider alternatives for the equipment required, as well as for the grade level appropriateness.

You can find stream tables in science catalogs – either hard copy or on the internet.

The pros are that these stream tables

- are of a nice size
- have built-in drainage ports
- come with ancillary materials, such as hoses and troughs

The cons are that these stream tables

- require virtually all the space on the top of a standard laboratory table
- often require that they be located next to a sink with a faucet to which a water tube/hose can be attached
- are relatively expensive for schools with today's budgets

One solution is to downsize the stream tables. The plastic trays used for wallpaper that you can procure at home improvement stores work well. You can drill a hole in one end and use water-proof glue to attach a drain if you wish. The limitation with using wallpaper trays is that one loses the width that can accommodate broad meanders in the streams created. You can also use large square dish pans, although the limitation with them is the length of the streams one can produce. In the version of stream tables provided in this five-activity set, the water supply is provided by siphoning water through small-diameter tubes, and one needs to "bail water" at the lower end of the stream table. These issues can be dealt with by locating the wallpaper trays/dish pans near water faucets and using the kind of tubing that comes with the larger commercial water tables, and by attaching drain ports to the "downstream" ends of the trays.

Younger children will probably do best with the smaller stream tables. They also are more likely to be able to make good observations about the shapes of streams as the water flows through them, such as what is necessary in Activity #1.

You can demonstrate with your fingers how to alter the path of the stream, and let children observe the results. Activity #3 and #4 are more appropriate for older students – middle grades and higher.

Activity #5 as shared in the version in this set is also best suited for older students, but a less sophisticated version is possible using a large plastic cup. In that version, you can have students place gravel in the bottom of a large, clear plastic cup, with sand layered on top of it. Angle the sand so it isn't flat, but is sloped. Gently pour water into the cup to saturate the gravel and sand. Then, soak the tip of a cotton swab with food coloring and insert it into the sand at one edge of the cup. Students can then easily observe how the coloring migrates away from the source and into the rest of the cup. See Figure 1below as an example of the cup version. Another version can be found on the EPA website listed at the end of these teacher notes.

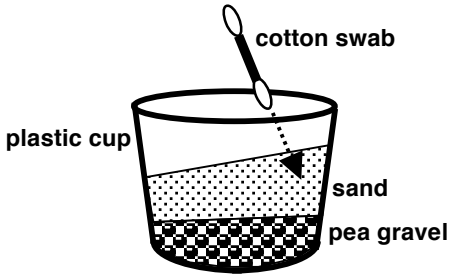

Figure 1: Cup Version

The materials you can use in the stream table can also vary. In the original version from ESCP (Earth Sciences Curriculum Project) in the 1960s, the earth material used was diatomaceous earth. This is a light-colored, extremely fine-grained material. The dust potential from it can be a problem if one isn't careful with it. A reasonable substitute is fine sand. Although you can purchase sifted sand at home improvement stores, it is better to obtain fine white silica sand (even available in five-gallon buckets). The sand can be washed when needed, and dries faster than diatomaceous earth. Gravels can be obtained from various sources as well, and pea gravel can be a good size gravel to use if needed in stream tables.

- In Activity 3, the directions have you cut a piece of flexible plastic that will serve as the dam. Plastic report covers or heavier acetate sheets work well, and colored ones show better than clear ones. Whatever your choice, the plastic needs to be flexible so that you can curve it with the outward bend downstream.

- In Activity 4, the directions have you insert a flat paraffin block horizontally into the sand. The paraffin serves as a resistant rock layer over which a waterfall will form. You can substitute a thick piece of plastic for the paraffin, but be sure the piece is thick enough to not bend. A piece of "plexi-glass®" can work, but white plastic usually shows best.

A good corollary activity to use along with stream tables is to have students look at maps that show streams on them. These can be political (road) maps, relief maps, topographic maps (for middle grades and older), etc. These are particularly useful if some of the maps show locations where the students live. The characteristics of the streams in the stream table can be found on the maps. Also very purposeful is to help students observe actual streams and compare what they see with what they've observed with the stream tables. Stream tables are, after all, only models of what actually exists on the earth's surface, so they have limitations.

Finally, if you prefer to have a version of the stream tables activities in which all the activities are sequenced together into a single (but longer) exercise, we have included for you the "compiled" version.

Some Useful Web Sources:

U.S. Geologic Survey
National Map Database: *ngmdb.**usgs**.gov/*
Maps, Imagery and Publications*: www.usgs.gov*

Illinois Geologic Survey
http://www.isgs.illinois.edu/maps-data-pub/maps.shtml

Exploratorium (University of California – Berkeley)
www.exploratorium.edu/IFI/docs/**Stream_Table**.pdf

PBS
www.pbs.org/americanfieldguide/teachers/floods/**stream_table**.pdf

U.S. Environmental Protection Agency
Office of Water (4606M): *www.epa.gov/safewater*