Deposition demonstrations – graded beds and ripple marks

Context & Aim:
The following demonstrations can be used to accompany work on the Transport & Deposition web-pages They can be used either as stand-alone demos or linked together with the demonstrations of Transport & Deposition by a stream and/or the turbidity flow demonstration.

Requirements:
Demo 1: Large measuring cylinder or gas jar (*at least* 30 cm tall), nearly filled with water, a supply of mixed sediment comprising fine gravel, coarse and fine sand and, if possible, coarse silt (but not clay or soil), a ladle or similar for transferring sediment into the jar. Rock sample (or photo) showing graded bedding.
Demo 2: Plastic aquarium, clean-washed sand, water. Rock sample (or photo) showing ripple-marks.

Procedure:
Demo 1: Ladle the sediment mix into the tall jar filled with water. Coarse sediments sink faster than finer grains (a good discussion point – *why?*). Graded beds typically form when there is a sudden influx of sediment into a lake or the sea – a flash-flood, turbidity flow, or sudden ash-fall from a volcanic eruption.

Note: Like most experiments, this requires a bit of practice, both with the sediment mixture and the technique for adding it to the water.

Demo 2: Pour about an inch depth of clean-washed sand into a plastic aquarium and fill $^1/_4$ to $^1/_3$ -full of water. Flatten out the sand.
Lift one end of the aquarium slightly, lower it, and repeat to get a wave sloshing from end to end of the tank. Again, a bit of practice helps avoid messy splashes! Ripple marks can be observed as they form by to-and-fro movement of the water moving the sand.

Follow-up:
Showing how sedimentary structures such as these are formed should enable students to understand how we can begin to interpret the environments in which rocks were formed long ago. Ideally, other examples could be discussed. The role of fossils in helping such interpretations could also be introduced.