COMPACTION

Purpose

To determine the amount of compaction shown by sediment of different sizes. Compaction is important when building roads and houses on loose materials and when explaining sediment changes on deltas.

Instructions

Activity I The effect of vibrations

1. ***Choose one of the sediments and an empty beaker.***

2. ***Pour the sediment slowly into the beaker until you have about 500ml. Make the top as level as possible using the spatula. Do not shake the beaker.***

3. ***Record the height of the sediment.***

4. ***Now thump the top of the table with your fist five times.***

5. ***Record the new height of the sediment.***

6. ***Pour the sediment back into the original container.***

7. ***Repeat with other grain sizes making sure you thump the table with the same number and strength of blows as before.***

Activity III The effect of pressure

1. ***Pour the sediment into the beaker and level it and record its height.***

2. ***Put the wooden disc into the beaker and place a 1 kg weight on the disc.***

3. ***Record the height of the sediment.***

4. ***Repeat with a 2 kg weight.***

5. ***Now tap the bench as before and record the height.***

6. ***Remove the weights and disc and pour the sand back.***

Teacher's Section

Requirements

500ml beakers with a scale stuck to each to record height.
Well sorted sand and gravel of a range of sizes 0.25mm, 0.5mm, 1.0mm, 2mm, 4mm are suitable. About 500ml of each should be put in a jar.
Disc or jam jar top to fit into beaker
1 and 2 kg weights

Notes

Each pair of students should take one sediment and work through the activities. All students should then compare results at the end.
Students should work on separate benches.

Checks

Beware of students shaking the beaker to level the sediment.
Make sure the students tap the table in the same way each time.

Results

Grain sizes $\frac{1}{4}$ to 2mm compact by about 5%, larger grains compact less. Adding the weight does not compact the sediments and largely prevents tapping having any effect.

Time

30 minutes