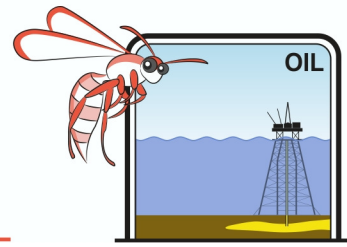


De-watering Of Sediments – Teacher Notes

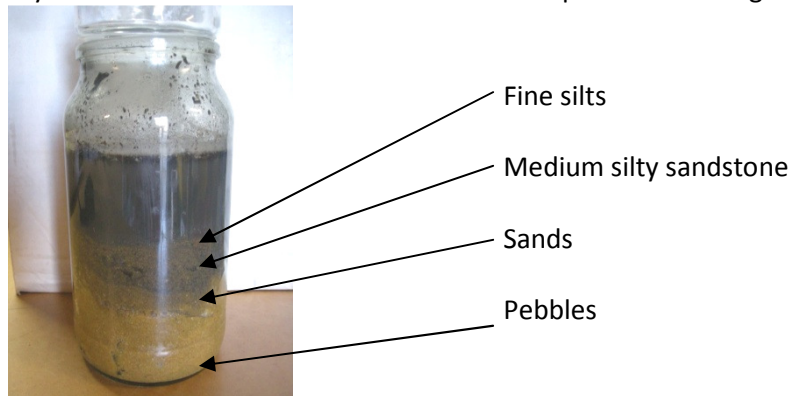


A host rock must contain hydrocarbons (organic material). The organics are rarely in high concentration. Source rocks form as sedimentary layers within basins. When marine sediments are compacted they de-water, become cemented and form sedimentary rocks such as sandstone, limestone, and shale. The organic material is changed chemically at the same time.

Layered deposition of sediments - Teacher demonstration

When mixed sized sediments and water are shaken, it will differentiate into layers. This is how bedding (sedimentary layers) is formed during deposition.

Place a mixture of pebbles, sand, clay or potting mix and water in a large screw topped jar. Close the lid and ask your most energetic student to give it a vigorous shake for two minutes. Leave the jar for five minutes and you will be able to see that the sediments separate according to size and density.



What is the difference between sediment and sedimentary rock? **Sediments are materials which have been laid down by wind or water. Sedimentary rock is sediment that has been buried, compacted and cemented. During this process the rock becomes dewatered.**

Student activity De-watering sediment



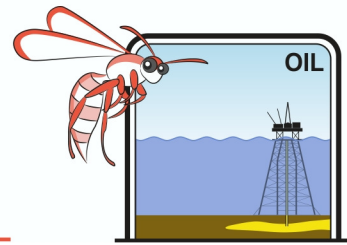
Height of sand 2.5cm



Height of sand + water 2.5cm or less

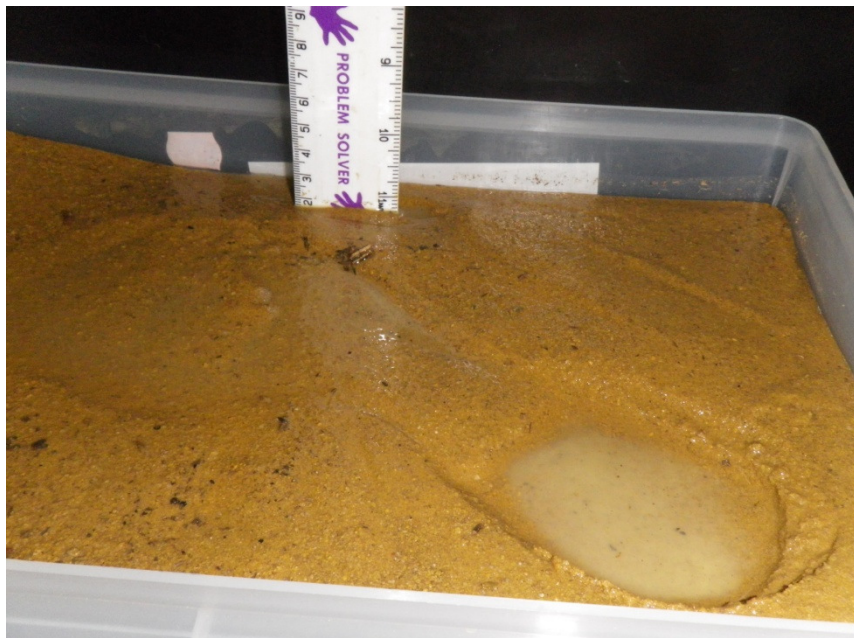
Materials required per person or group:

- 1 plastic container or tray larger than a student's foot. Laboratory or student desk trays are excellent
- Sufficient dry sand to fill tray to a depth of between 2 and 3cm.
- 1 jug of water
- 1 plastic ruler
- 1 well shod student



De-watering Of Sediments – Teacher Notes

1. Place a layer of dry sand in the bottom of a plastic container.
2. Place the ruler into the sand and measure the height of the sand. **2.5cm**
3. Add water to the sand until it is very damp (about 1 litre).
4. Measure the height of the damp sand. **2.5cm**
5. Explain any changes or lack of changes in the height of sand after water has been added.
Water has seeped into the empty pore spaces between the grains so the level of sand has not risen. NOTE If the tray is moved, the level of the top of the sand may even drop as liquid may allow sand grains to slip about and fit together better.
6. Firmly step onto the sand with one foot. Keep your weight on the wet sand for 1 minute before stepping off.
7. Wait for 1 minute and record what has happened to the level of the wet sand.
The area under the foot has become compacted under pressure forcing water out from between the sand particles. When the foot was removed, water flowed into the depression.



Water above compacted sand in footprint

When sediments are overlain by younger deposits water is squeezed upwards towards an area of lower pressure. Students may have noticed this when walking at the edge of the sea or across clay pans. Students can also stand on wet kitchen sponges and see how pressure dewateres the sponge. In both cases water was held in the holes or pores.

8. What happens to any fragments of dead living things in the sediment during this compression? **They become compressed and converted into kerogen. Kerogen is the precursor to oil and gas**
9. Draw what will happen to this sediment when it is overlain by more sediment.

| | |
|-------------------|------------------|
| | |
| Before compaction | After compaction |