

BOREHOLES

Purpose

To locate and describe the oil trap and to suggest the best position for a production well.

This activity will give you practice in predicting where to drill exploration bore holes, in contouring the depths to the reservoir bed, in drawing sections and in locating production wells.

Background

The model represents an area underlain by this sequence

shale

sandstone 150m thick

shale 500m thick

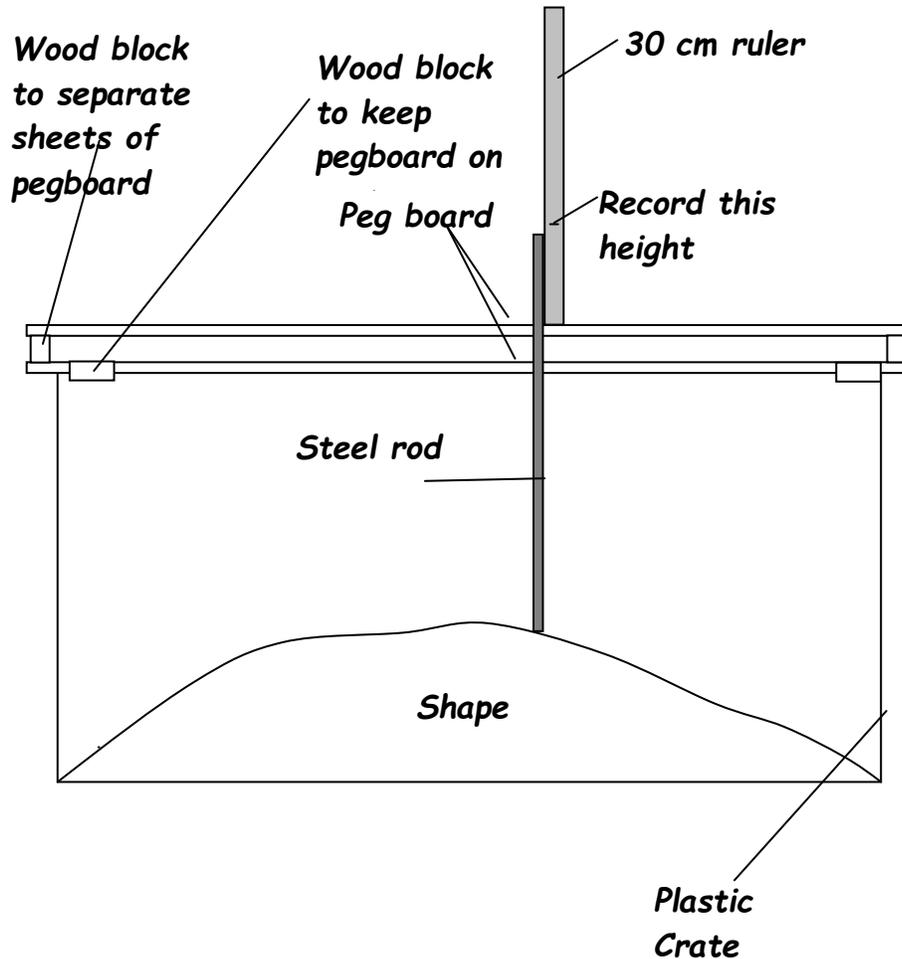
Each centimetre on the ruler and on the board represents 100m

It is your task to detect if there is an oil trap beneath the area . You are only allowed 30 exploration holes. The depth measured in each hole gives you the depth to the top of the sandstone.

Activity

- 1. Place the rod vertically in the hole and measure the depth using the ruler. The depth of the hole is the reading on the ruler at the top of the rod when the ruler has the 30cm mark next to the pegboard. The ruler should have the "0" at the top.*
- 2. Use the co-ordinates to locate the borehole on the map and then plot the depth.*
- 3. Choose the site for the next borehole and repeat the process*
- 4. Repeat the process until you have drilled 30 boreholes.*
- 5. Contour the data.*
- 6. Draw a section across the map at right angles to the fold or fault. Put on both the top and bottom of the sandstone. Describe the shape of the trap.*
- 7. Assume the gas occupies the top 100m and the oil the next 300m. Mark on the section the parts occupied by the gas, oil and water.*
- 8. Locate the best position for a production well.*

Teacher's Section



Requirements

A box 50cm by 40 cm by 20cm. A plastic crate is good.

Pegboard

Hardboard shapes to fit, one at a time, inside the crate; symmetrical and asymmetrical folds, fault, or a basin up side down

A 30cm steel rod to fit the holes in the peg board. File end to a blunt point.

A 30cm ruler marked "top" at 0 end

An A4 map of the top of the box with the co-ordinates marked on

Making the equipment (1 hour)

Fix two pieces of pegboard 2cm apart to cover the top of the crate.

Make sure the holes are fixed exactly above each other. This must fit

firmly on the crate but must be removable. Mark A to Z on one edge and 1 to 20 on the other to give co-ordinates.

Checks

Make sure the students have the ruler the correct way up and make sure they do not cheat by lifting the top and peeking at the structure.

Time

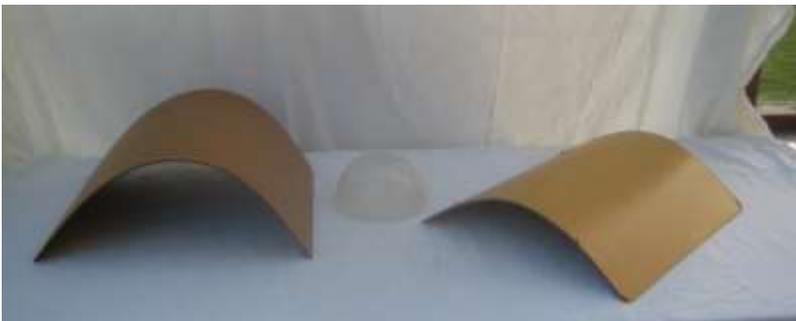
30 minutes

Cost

Crate £6.



Outside view of the box



Some shapes used