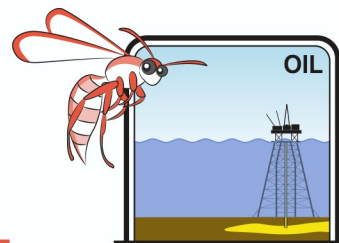


Migration Rate - Teacher's notes



Migration of hydrocarbons through rocks and sediments often takes extremely long times, often many millions of years. An impression of different rates through different soil mediums can be gained by this simple experiment below that measures their relative permeability. Easy to compare specimens are: pea gravel, road metal, river sands, beach sands, potting mix, garden soil etc.

Materials required per student or per group:

- 1 large measuring cylinder
 - 1 beaker
 - Water
 - Specimens of different sediments (sand, silt, potting mix, clay, gravel)
 - Access to a sink or bucket to wash equipment between tests
1. Use the measuring cylinder to measure 200mL of the first soil sample
 2. Place soil in the beaker and gently shake until it is level
 3. Wash any soil remaining in the measuring cylinder and fill with 300mL of water
 4. Gently add water to the sediment in the beaker until the water is level with the top of the soil
 5. Estimate how much water was used
 6. Enter this into the table
 7. Clean equipment and repeat with other specimens

Permeability of the specimen is:
$$\frac{\text{volume of water required} \times 100}{\text{volume of specimen}}$$

E.g. The permeability of 200mL of sand from my back garden, which absorbed 178mL of water is:

$$\frac{178 \times 100}{200} = 89\%$$

Specimen	Volume of water absorbed	Permeability

The unit used by petroleum geologists and engineers to measure permeability is the darcy, named after Henri Philibert Gaspard Darcy a 19th century French hydraulic scientist. During his work on building bridges he studied the flow of water through various porous materials. The work has been critical to estimating hydrocarbon migration rates. The units are comparable only and not SI units.