

CASE STUDY 09 · EDUCATION

RemScan as a Tool for STEM Education

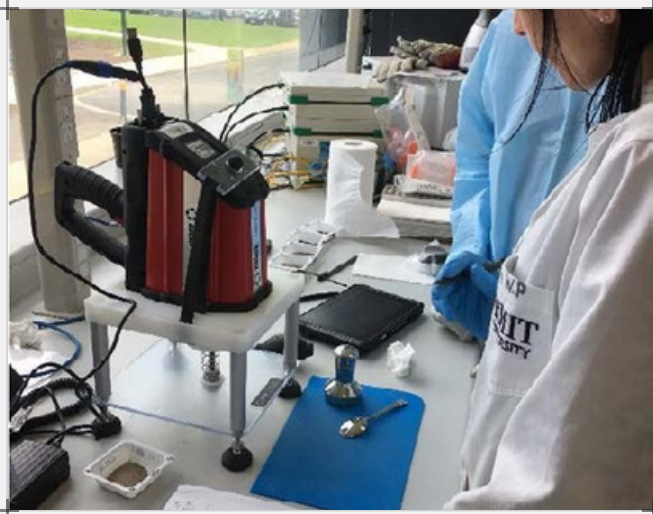
At RMIT University, 30 student groups measure their own bioremediation experiments inside a single practical class – studies that would otherwise be impossible in the classroom.

Bioremediation is a simple, low-cost and environmentally safe method for cleaning up total petroleum hydrocarbons (TPH) in soil. It uses natural microorganisms in the soil to break down the TPH chemicals into harmless by-products such as CO₂ and water. The effectiveness of the process is measured by the decrease in TPH achieved over time.

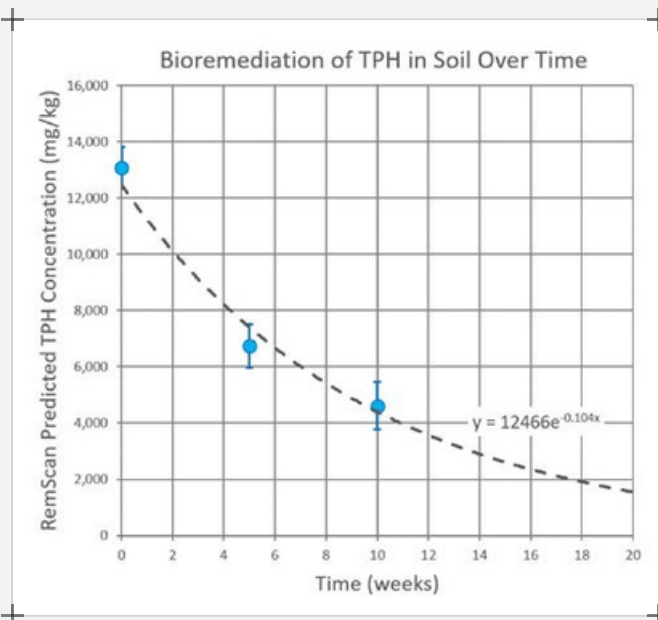
The standard approach for measuring TPH in soil involves sending soil samples to an external laboratory for analysis using gas chromatography, which is costly and time-consuming. RemScan provides a rapid, accurate and inexpensive alternative: the hand-held unit measures soil directly, without solvent extraction, and provides a TPH measurement (mg/kg) in less than 20 seconds.

RemScan is being used as a teaching tool in Science, Technology, Engineering and Mathematics (STEM) education at RMIT University in Australia. Students enrolled in the Environmental Biotechnology (BIOL2324/BIOL2370) course have been using RemScan to measure the effectiveness of bioremediation as part of their practical laboratory training.

Given the short time frames and limited resources available for the teaching course, such studies would normally be impossible to carry out in the classroom.



Students measuring diesel-contaminated soil with RemScan during a practical class.



Bioremediation of TPH in soil over time, measured by scanning with RemScan.

IN THE CLASSROOM

RMIT students take advantage of RemScan's rapid measurement time and ease of use to monitor the progress of the bioremediation of diesel-contaminated soil in the laboratory. Since 2017, around 400 students have completed the course and used RemScan as a teaching aid.

THE COURSE

The Environmental Biotechnology course caters for students from a range of backgrounds including biological, chemical, physical, social and health sciences. It covers key aspects of environmental microbiology including the diversity, function and ecological adaptations of microorganisms within the environment, then explores how environmental microorganisms, products and processes can be applied within the environmental biotechnology sector to benefit society and the environment.

The course also outlines how microbiology can be applied to address key environmental and biological challenges facing society, integrating scientific understanding with legal, regulatory and societal considerations. Key themes include biogeochemistry and biodegradation, waste management and processing, and bioenergy.



Each group analyses its own experiment within the practical class.



Practical laboratory training, Environmental Biotechnology (BIOL2324/BIOL2370).

400 students

Have used RemScan in the course since 2017

IN THE CUSTOMER'S WORDS

"The RemScan made it possible for all 30 groups of students to analyse their own experiment during the practical laboratory class. This resulted in an enhanced appreciation and understanding of the process of bioremediation."

Professor Andy Ball · RMIT University