



**HERITAGE  
INTERNATIONAL  
XPERIENTIAL SCHOOL**

# Science Competition winners in South Asia

27 August, 2024



Six students from Heritage International Xperiential School in India won the Best in Region award for their investigation into the best way to maximise energy production of microbial fuel cells (MFCs).

MFCs harness electrical output generated by the respiration of microbes via electrodes sunk into environments where those microbes thrive. These environments do not need to be made artificially, as they exist in everyday life in the form of mud, dirty water and even snow.

Students Idhant Kumar, Arjun Sharma, Akshit Khera, Ronak Prakash, Mrityunjay Rai Nagpal and Vivaan Chadha researched how different variables – electrode materials, alkalinity increasers and substrates – affect the rate of microbial fuel cell energy production.

The team found that graphite electrodes produced the highest voltage, baking soda raised the pH of the wastewater (making it optimum for the generation of voltage and current) and Ethyl Acetate made the best substrate (though the team did note that the alternatives they tested were cheaper and performed similarly).

Team member Arjun Sharma said: 'I enjoyed working in depth on a real-world issue and using the scientific method and format to present my findings [...] We chose microbial fuel cells because it's a place where we thought we could make an impact. MFCs are an underdeveloped yet promising area when it comes to green energy. As we try to approach a sustainable future it is instrumental that we understand every part of the world to its full abilities.'

The judges said: 'Their experiments were thorough and quantitative and their innovative bioengineering approach excited the judges.'

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**Shalini Kulshrestha, Mentor Teacher at Heritage International Xperiential School**

The Cambridge science competition has paved the way for our students to become well-equipped scientists and researchers. The skills and mindsets they have developed will enable them to tackle future scientific challenges effectively and contribute significantly to a sustainable environment. This experience has provided a strong basis for their continued growth and success in problem-solving, particularly in addressing environmental degradation and the energy crisis, both in the world of science and beyond.

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