
Astrobiology at middle school level in Pakistan

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Abstract

1. Introduction:

Astrobiology is one of the most fascinating subjects of all time; it explores and helps us find answers to the most intriguing questions pertaining to life and the universe. People have always wondered how Earth works as a planet, and how it has changed over time, and what really makes it an active planet, utterly different and diverse from other rocky planets. If we talk about the evolution of life, it is amazing to see how life evolved over time since 3.5 billion years ago, when the first life formed on planet earth, how life evolved gradually from a single-celled organism to the complex life form that walks among us today. Naturally, the evolution of life is not the simplest subject to understand, as it takes a lot of courage, time and research to grasp all knowledge of the lengthy and gradual process of evolution of the most mysterious phenomena known as Life on planet Earth. From the earliest emergence of life to the present, we can easily observe how living organisms have evolved and adapted to their environment. We have come really far in terms of understanding our own Earth as a planet and as a species or as part of the Tree of Life on earth. We have uncovered numerous mysteries which our ancestors couldn't fathom the possibility of, no more than a century ago. Astrobiology asks the most important questions about our existence: what is life, how did life start on earth, what is the possibility of life on other planets, we try to answer these questions through the lens of astrobiology. And I have always been fascinated by these attempts.

2. Astrobiology on the primary and secondary level:

I'm teaching astrobiology to grade 2nd, 6th, and 7th at Lahore Grammar School EME since 2017. The last session (2018-2019) was more focused on the practical side of astrobiology rather than theoretical. For example, students were asked to build/design their own rover and a mission to Mars. A workshop was held in which students attempted to construct telescopes and learned how to use a telescope. Students also looked for tardigrades under a microscope in order to understand extreme environments and extremophiles. It was also more focused on the exploration of Mars. Students also participated in a contest of art and astrobiology held by Astrobiology Network of Pakistan. By the end of every session, students were told how to choose a career in astrobiology. In the last 2 sessions of astrobiology, more than 900 students were familiarized with the basic concepts of astrobiology. Future projects involve designing a short course of astrobiology for deaf students and introducing astrobiology in other schools and colleges.

3. Astrobiology in the Classroom:

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A wide range of topics was covered in every session along with the activities, from how life started on earth to how we look for life in the universe. The main objective of these lessons was to teach students a variety of science subjects that cut across the interdisciplinary nature of astrobiology, including physics, biology, chemistry, geosciences, and astronomy.

4. Conclusions:

Astrobiology is the most effective avenue for introducing young students to a wide range of science subjects. By focusing on topics such as how life started in such an extreme environment to what is the possibility of life in the universe, astrobiology has a natural tendency to inspire students to choose a career in these fields. They will get a chance to contribute in this field but act participate actively in future space exploration missions and research.

5. References:

<https://astrobiology.nasa.gov/ask-an-astrobiologist/>

<https://astrobiology.nasa.gov/research/astrobiology-at-nasa/>

<http://sci.esa.int/rosetta/26283-astrobiology/>

<http://saganet.ning.com/page/saganet-ed>

6. Short Summary:

The main goal is to use the fascinating field of astrobiology as a mean to inspire Pakistani youth towards STEM education. Second is to impart Astrobiology as a subject starting from the grassroots level so that kids opt to learn astrobiology with passion and grow up to be enthusiastic professionals. More than 400 students are enrolled in the 3rd session of astrobiology.