Astrobiology Learning Progressions: a Tool for Scientists and Educators to Plan and Conduct Education and Outreach

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Abstract

Learning progressions provide a sequence, or progression, of concepts from naive to sophisticated. Astrobiology educators and scientists have identified the need to develop learning progressions for core, interdisciplinary concepts in astrobiology to support both educators of K-12 students to bring astrobiology concepts into their classrooms, and scientists to communicate with a range of audiences. The Astrobiology Learning Progressions resource organizes core concepts around the essential questions of astrobiology, and includes connections to the Next Generation Science Standards, progressed storylines, and concept boundaries for four levels: primary or adult naïve learners, elementary or emerging adult learners, middle school or building learner, and high school or sophisticated learner. The resource also links lesson plans and other learning materials to each core concept.

NASA Astrobiology Learning Progressions

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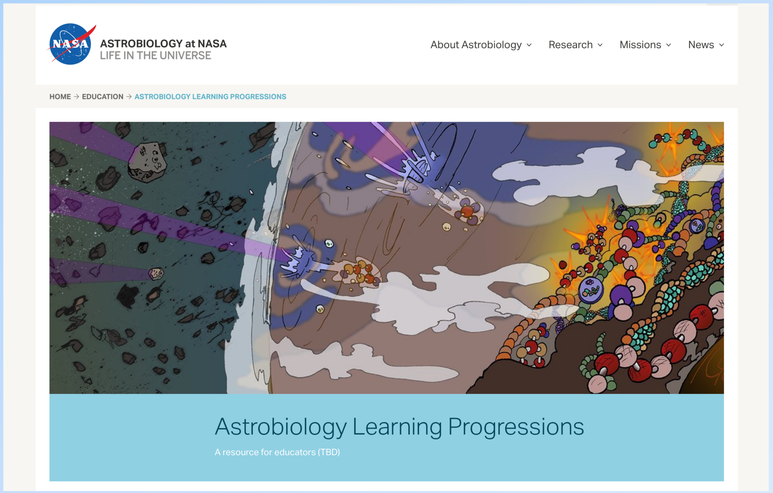
https://astrobiology.nasa.gov/education/alp/



Astrobiology educators and scientists identified the need to develop learning progressions for core concepts in astrobiology to support both educators of K-12 students to bring astrobiology concepts into their classrooms, and scientists to communicate with a range of audiences.

Informed by the Astrobiology Primer v.2.0, the planetary decadal survey, and existing curriculum, seven core learning questions were identified.

1. ***How does understanding the origin and evolution of the Universe inform our understanding of the origins of life?***
2. ***How did Earth become a planet on which life could develop?***
3. ***What is life?***
4. ***How did life on Earth originate?***
5. ***How have life and Earth co-evolved?***
6. ***How has life evolved to survive on diverse environments on Earth?***
7. ***How do we explore beyond Earth for signs of life?***

Four Levels

- *Primary or adult naïve learners*
- *Elementary or emerging adult learners*
- *Middle school or building learner*
- *High school or sophisticated learner*

Learning progressions provide a sequence, or progression, of concepts from easy to more difficult.

The Astrobiology Learning Progressions Website has storylines, Disciplinary Core Ideas, concept boundaries and resources for each level..