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Curriculum Units by Fellows of the National Initiative
2021 Volume IV: The Sun and Us

The Sun and Photosynthesis: From Photons to Astrobiology

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by Chris Sikich

Sunlight is so ubiquitous that we take it for granted. When thinking of photosynthesis, it is a necessary ingredient emanating from the Sun. But to consider the origin of photons of light and the journey they take to get here is the crux of this unit for high school biology students. The first part of the unit explores the travels of photons from the core of the Sun to chloroplasts to aid in the process of photosynthesis. The second part of the unit considers how disasters could limit the exposure of photons to plants. Thinking about asteroid impacts, volcanic eruptions, wildfires and nuclear explosions, the limitations or enhancements to photosynthesis that occur because of these events will be revealed and discussed. In the final part of the unit, astrobiology will be explored. By considering what could make another planet habitable or not, students will research known exoplanets to hypothesize whether or not life could exist on them, taking into account the planet's distance from its parent star(s), planet composition including water occurrence, signatures of chemicals that are a byproduct of life, and potential for photosynthesis.

(Developed for Biology, grade 9, and AP Biology, grades 10-12; recommended for Biology and AP Biology, grades 9-12)

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