



Alien Worlds Exhibit Workshop: Habitable Planets

A Pre-Visit Information Guide for Teachers

Meets Rhode Island Grade Span Expectations: ESS2(5-6)-6, ESS2(7-8)-7, ESS2(7-8)-8

Are we alone in the Universe? Are there other planets out there that might be able to support life? Since the discovery of the first exoplanet (planet orbiting another star) in 1995, scientists have come closer to answering these questions. But what makes a planet habitable, and how can we come to understand more about these distant worlds? This workshop will expose students to the science of exoplanet research and the search for Earth-like planets.

OBJECTIVES

- **Finding exoplanets**

The immense distance between the Earth and exoplanets poses a problem for astronomers. Students will learn about the various ways that exoplanets can be detected, and what can be determined about a planet by these methods.

- **Habitability**

What makes a planet able to support life? Students will learn about the various factors – including atmosphere, magnetic field, liquid water, good temperatures – that allow planets to support life. They will examine descriptions of different planets to determine their habitability.

- **Alien Worlds Exhibit Quest and Investigation Stations**

Students will continue their exploration in an exhibit question throughout the “Alien Worlds” exhibit, discovering the past, present, and future of exoplanet research as well as the most up-to-date discoveries of new planets. Interactive investigation stations challenge students to explore the factors crucial to a planet’s habitability.

ACTIVITIES

Teachers are encouraged to conduct pre-visit and post-visit classroom discussions and activities with their classes to make the most of their experience. An excellent activity that will get students thinking about their location within the galaxy and the immensity of space can be found at:

<http://www.lawrencehallofscience.org/pass/passv09/PASSv09-GalacticAddress.pdf>

HELPFUL VOCABULARY

Atmosphere – The layer of gases surrounding a planetary body and is held in place by gravity.

Exoplanet – A planet that orbits a star other than our Sun, also called an extra-solar planet.

Habitability – The measure of a planet's capacity to support life. Important factors for habitability include liquid water, an energy source (such as a star), atmosphere, magnetic field, etc.

Light Year – A measure of distance that is equal to the distance light travels in one year, or about 6 trillion miles.

Magnetosphere – The protective layer that surrounds some planets due to the magnetic field created by the planet's core.

Transit – An astronomical event that occurs when one celestial body appears to move across the face of another celestial body, as seen by an observer at some particular vantage point. Many exoplanets have been discovered by their transits across the face of their parent star.

WEBSITES

NASA's website about the Kepler mission:

<http://kepler.nasa.gov/>

NASA's PlanetQuest, a compendium of sites about exoplanet research:

http://planetquest.jpl.nasa.gov/resources/resources_index.cfm