Overview of ESS Unit 2 Astronomy

Content Focus	Duration	Instructional Outcomes
Introduction to Project: Another World? *Students will be presented with RFP and Project Scoring Tool.*	1 Day	• Students will learn to specify criteria and constraints for the design of the project. • Students will identify the problem and begin discussing what they will need to successfully complete the RFP. **Another World Project Connection:** *Students will be introduced to the five extrasolar planets discovered by the Kepler Mission as of October 2009. Students will begin to identify the conditions unique to Earth that are necessary for life.*
Earth-Moon-Sun Interactions *Physical laws govern the nature of objects in the universe.*	7 Days	Students will explain the role of forces in the formation and operation of the universe by investigating Keplers 3 Laws of Planetary Motion, Newton's Universal Law of Gravitation and the Sun-Earth connection. **Another World Project Connection:** *In order for students to choose their "other Earth" they must be able to explain the important relationship between the Earth, Moon and Sun and describe how Kepler's laws explain the orbital motion of planets. This information will allow them to start to critically analyze their options from the Kepler mission.*
Solar System *Relationships exist between the Earth and all other celestial objects in our solar system.*	9 Days	• Students will describe the formation and evolution of the solar system and explain the different components and their relationship to each other. **Another World Project Connection:** *The solar system is a vast region containing the sun, planets, and many other objects. Students will compare our own solar system to the "other Earth" locations and evaluate if each solar system option has the necessary components. Students will consider the implications that the size of a planet can have on a solar system and the distance from its star.*
Stars *Physical laws and forces determine stellar evolution and processes.*	6 Days	• Students will explain the stellar structure and evolution of our universe including the life cycle of stars, stellar systems, and constructing and interpreting H-R diagrams. **Another World Project Connection:** *Students will investigate the characteristics of stars and their life cycles and use this information to evaluate the "other Earth" stars in considering their solar system selection. Additionally students will consider the types of light the star puts out.*
Universe *The "Big Bang" theory is the current theory for the formation and evolution of the universe.*	4 Days	• Students will describe the structure and evolution of galaxies and the universe, including the Big Bang Theory. **Another World Project Connection:** *Students will investigate the formation and evolution of the universe and apply this process to their "other world's" development.*
Another World Project *Continuation of development and evaluation of project.*	4 Days	• Students will learn that design is a creative planning process that leads to useful systems and that design usually requires taking constraints into account. *Students will apply the knowledge they have gained throughout the entire unit sequence to select their "other Earth" and support their selection with data and information collected throughout the unit.*