Impact 3
Unit 6
Main Video Script
Scene 6.1: *Europa: Ocean World*

Kevin Hand: The search for life beyond Earth, begins with understanding life on our home planet. And that story, the story of life on Earth, may have begun in our oceans. And that's because, of course, if we've learned anything about life on Earth, it's that where you find the liquid water, you generally find life. So, what if I told you that there is an ocean out there beyond Earth? An ocean in our solar system that has been in existence for billions of years? It's an ocean that is perhaps ten times as deep as Earth's ocean. It's an ocean that is global and may contain two to three times the volume of all the liquid water on Earth. It's an ocean that exists beneath the icy shell of Jupiter's moon, Europa. So, how do we think we know that Europa's ocean exists? Well, it's a combination of using telescopes on the ground, and having spacecraft that have flown by Europa and collected data about the surface, about the interior structure, and about the magnetic field around Europa. And the combination of those data sets leads us to a high degree of confidence that this global liquid water, or H2O ocean, is there today and it's been there for much of the history of the solar system. We used to think that, in order for a world to be habitable, you had to be at just the right distance from the sun or whatever your star was, so that you could have a liquid water ocean on the surface. Now, along with liquid water, life as we know it needs two other keystones: The first is the building blocks for life, the stuff you find in rocks. And the second is some form of energy to help power life. The question of whether or not life exists beyond Earth—the question of whether or not biology works beyond our planet—is one of humanity's oldest, and yet unanswered questions. And for the first time in the history of humanity, we have the tools and technology and capability to potentially answer this question. And we know where to go to find it: Jupiter's ocean-world, Europa.

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