<table>
<thead>
<tr>
<th>Anchoring Phenomenon</th>
<th>Standard</th>
<th>Instructional Segment</th>
<th>Disciplinary Core Ideas</th>
<th>Science and Engineering Practices</th>
<th>Instructional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomprehensible: The Scale of The Universe</td>
<td>SEV1. a, b, c, d SEV2. c, d</td>
<td>Planet Earth: Ecology</td>
<td>Frameworks of K-12 Science Education: By the end of grade 12: <strong>HS-LS1-2</strong> Develop and use a model to illustrate the hierarchical organization of interacting systems. <strong>HS-LS2-1</strong> Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems. <strong>HS-LS2-2</strong> Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems. <strong>HS-LS2-4</strong> Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. <strong>HS-LS2-5</strong> Develop and use a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon. <strong>HS-LS2-6</strong> Develop and using models Using mathematical and computational thinking Engaging in argument from evidence Planning and carrying out investigations</td>
<td>Background This unit covers the first half of the environmental science course that includes population ecology, natural resources, biomes, and biodiversity. For courses that are on the block, this unit should be condensed into 9 weeks. Particular care should be given to emphasize the necessity of energy as it flows through ecosystems (the first and second law of thermodynamics). By the end of this unit, students are using the following language in their speaking and writing: Organism Population Community Ecosystem Biosphere Energy</td>
<td></td>
</tr>
</tbody>
</table>
| Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. **HS-LS2-8**  
Evaluate evidence for the role of group behavior on individual and species. **HS-LS4-5**  
Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of some species, (2) the emergence of new species, and (3) the extinction of other species. **HS-ESS2-5**  
Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. **HS-ESS2-6**  
Develop a quantitative model to describe the cycling of carbon. **HS-ESS3-3**  
Illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity. |

| Energy transfer  
Food chain  
Food web  
Trophic level  
Entropy  
Biogeochemical cycle  
Hydrologic cycle  
Nitrogen cycle  
Phosphorus cycle  
Oxygen cycle  
Carbon cycle  
Biomes  
Topography  
Aquatic  
Estuary  
Biomass  
Biodiversity  
Complexity  
Ecological succession  
Ecosystem resilience  
Keystone species  
Invasive species  
Native species  
Endemic species  
Indicator species  
Endangered species  
Renewable energy  
Nonrenewable energy  
Fossil fuels  
Sustainable |

This instructional segment will connect to the Rhythms of Planet Earth instructional segment.