Connecting to State Science Education Standards such as *Next Generation Science Standards*

* Discuss an example of ways in which you might engage children of the age you want to teach in learning about earth and space science by developing a disciplinary core idea, using at least one of the science and engineering practices and one of the crosscutting concepts articulated in the *Next Generation Science Standards* Appendices E, F, and G (see: <https://www.nextgenscience.org/get-to-know>.) An example set of a disciplinary core idea, science and engineering practice, and crosscutting concept is shown in Table V. 17. A list of those addressed in this course is attached below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table V.17  Dimensions of *Next Generation Science Standards* (NGSS Lead States, 2013) Relevant to Exploration of the Phases of the Moon | | | | |
| Dimensions | Element | Grades K-2 | Grades 3-5 | Grades 6-8 |
| Disciplinary Core Idea | Earth Space Science ESSI-A | Patterns of movement of the sun, moon, and stars as seen from Earth can be observed, described, and predicted. | The Earth’s orbit and rotation, and the orbit of the moon around the Earth cause observable patterns | The solar system contains many varied objects held together by gravity. Solar system models explain and predict eclipses, lunar phases, and seasons |
| Science and Engineering Practice | Engaging in Argument from Evidence | Construct an argument with evidence to support a claim | Construct and/or support an argument with evidence, data, and/or a model. | Construct, use, and/or present an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem |
| Crosscutting Concepts | Patterns | Children recognize that patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence | Students…identify patterns related to time, including simple rates of change and cycles, and to use these patterns to make predictions. | Students… use patterns to identify cause and effect relationships, and use graphs and charts to identify patterns in data. |

Next Generation Science Standards Explored in This Course

<http://www.nextgenscience.org>

**Science and engineering practices:**

Asking questions and defining problems.

Developing and using models.

Planning and carrying out investigations.

Analyzing and interpreting data.

Using mathematics and computational thinking.

Constructing explanations and designing solutions.

Engaging in argument from evidence.

Obtaining, evaluating and communicating information.

**Cross Cutting Concepts**

Patterns

Cause and effect

Scale proportion and quantity

Systems and systems models

Energy and matter, flows, cycles and conservation

Structure and function

Stability and change

**Disciplinary Core Ideas Partially Explored in This Course**

Physical Sciences

PS1A: Structure and Properties of Matter

PS2A: Forces and Motion

PS3A: Definitions of Energy

PS3B: Conservation of Energy and Energy Transfer

PS4A: Wave Properties

PS4B: Electromagnetic Radiation

Earth and Space Sciences

ESS1B: Earth and the Solar System

ESS2D: Weather and Climate

ESS3D: Global Climate Change