

## Space Science Sequence

### Overview

- Unit 1- How Big and How Far?
  - Girls will discuss what the first exploration of the sky might have been like, and read about the first “sky explores,” a sheep, a duck, and a chicken that were sent up in a hot air balloon. They learn the definition of scientific evidence, and discuss how this expedition provided evidence that there was enough air at certain altitude for animals (and people) to breathe.
  - Girls learn that scientific knowledge is based on evidence and that they will be acting as scientists in the coming sessions, discussing ideas and explanations, and evaluating them based on evidence.
- Unit 2- Earth’s Shape and Gravity
  - A pre-unit questionnaire launches your girls into animated discussions about the implications of a ball-shaped Earth, giving them the opportunity to examine their preconceptions and to explore the Earth’s shape and gravity. First, each girl fills out the questionnaire individually. Then, girls work in small groups to discuss their ideas about each of the questions. They use a globe to explain their ideas about the Earth’s shape and gravity.
  - Finally, you facilitate a group discussion of the questions, keeping in mind that ideas and insights about the Earth’s shape and gravity develop gradually.
- Unit 3- How Does the Earth Move?
  - The primary purpose of the first session is for the girls to share their ideas about how the Earth moves, setting the stage for the rest of the unit. The session begins with a questionnaire about positions and movement of the Sun and Earth. Afterwards, the girls share observations about how the Sun and stars appear to move in the sky.
  - After a brief lesson of key concepts about models, students hear about five ancient models that explain the apparent movement of the Sun. They learn that the Greeks lived at the crossroads of trade routes. Realizing that all the stories they heard couldn’t be true, the Greeks attempted to come up with *scientific models* that could be tested, using evidence.
- Unit 4- Moon Phases and Eclipses
  - Girls engage in a short activity about light and shadow, to help them understand the reasons for Moon phases and eclipses presented in later sessions. In teams of two, they explore shadows cast by a polystyrene ball and record their observations. As they share their observations, they learn that shadows are the absence of light, and that shadows can be thought of as having three parts.
  - Girls learn a way to measure the Moon’s position in the sky relative to the Sun, using their fists. Girls will go outside to observe and measure the Moon’s apparent position and shape. Through their observations, girls notice a pattern, which prepares them to understand the model for Moon phases that will be presented in this unit.

### Age Level

- Brownies and Juniors