

# Modeling and Moving Around the Sphere with K-2

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Consulting



- **Be yourself, think about being a 6 year old**
- **Kinesthetic Astronomy**  
<http://www.space-science.org/eduresources/kinesthetic.php>
- **Adapting to older age groups**
- **Teacher guide**  
<https://tinyurl.com/sample-teacher-guide>



# Grade 1-2 SUN/MOON/SEASONS/WEATHER

## SMSeasons\_G1-2\_playlist

1. Blue Marble
2. Sun: X-Ray - 2003
3. **Activity: Earth's day**
4. Blue Marble and Nighttime Lights
5. **Activity: Earth's seasons (option)**
6. Blue Marble: with Topography - Seasonal optional
7. Bird Migration Patterns

1-ESS1-1. Use observations of the Sun, Moon, and stars to describe that each appears to rise in one part of the sky, appears to move across the sky, and appears to set.

1-ESS1-2. Analyze provided data to identify relationships among seasonal patterns of change, including relative sunrise and sunset time changes, seasonal temperature and rainfall or snowfall patterns, and seasonal changes to the environment.



## G3-5 SUN/MOON

### G3-5\_SunMoon\_playlist

1. Earth (Blue Marble)
  2. Sun: X-Ray - 2003
  3. **SOS Activity: Earth's day (KA)**
  4. Milky Way Panorama- Alpha Centauri label
  5. **SOS Activity: Earth's year (KA)**
  6. Blue Marble and Nighttime Lights
  7. **SOS Activity: Moon's revolution**
  8. Moon Transit
  9. Moon Phases
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10. Moon: Surface Temperature (optional)

5-ESS1-2. Use a model to communicate Earth's relationship to the Sun, Moon, and other stars that explain (a) why people on Earth experience day and night, (b) patterns in daily changes in length and direction of shadows over a day, and (c) changes in the apparent position of the Sun, Moon, and stars at different times during a day, over a month, and over a year.

Clarification Statement:

- Models should illustrate that the Earth, Sun, and Moon are spheres; include orbits of the Earth around the Sun and of the Moon around Earth; and demonstrate Earth's rotation about its axis.

State Assessment Boundary:

- Causes of lunar phases or seasons, or use of Earth's tilt are not expected in state assessment.



## G6-8 SUN / MOON / GALAXY

### G6-8 Playlist

1. Earth (Blue Marble)
2. Sun: X-Ray - 2003
3. Milky Way Panorama- Alpha Centauri label
4. All Sky Wide-field Infrared Survey Explorer Mosaic Image
5. Moon Phases (KA)
6. Solar Eclipse Simulation (NOAA) - August 21, 2017
7. Lunar Eclipse Aug 28, 2007 (NASA)
8. Moon Transit

6.MS-ESS1-1a. Develop and use a model of the Earth-Sun-Moon system to explain the causes of lunar phases and eclipses of the Sun and Moon.

Clarification Statement:

- Examples of models can be physical, graphical, or conceptual and should emphasize relative positions and distances.



# HS SUN/BIG BANG THEORY

## HS\_SunBigBang\_playlist

1. Blue Marble
2. Sun: X-Ray – 2003
3. Sun: Helium Wavelength
4. Sun: Iron Wavelength
5. Milky Way Panorama- Alpha Centauri
6. All Sky Wide-field Infrared Survey Explorer Mosaic Image
7. Cosmic Microwave Background: (5<sup>th</sup> year)
8. Cosmic Microwave Background: (3<sup>rd</sup> year)
9. Cosmic Microwave Background: (1<sup>st</sup> year)
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10. Satellites: Paths and Positions (optional-Kepler's)

HS-ESS1-1. Use informational text to explain that the life span of the Sun over approximately 10 billion years is a function of nuclear fusion in its core. Communicate that stars, through nuclear fusion over their life cycle, produce elements from helium to iron and release energy that eventually reaches Earth in the form of radiation.

HS-ESS1-2. Describe the astronomical evidence for the Big Bang theory, including the red shift of light from the motion of distant galaxies as an indication that the universe is currently expanding, the cosmic microwave background as the remnant radiation from the Big Bang, and the observed composition of ordinary matter of the universe, primarily found in stars and interstellar gases, which matches that predicted by the Big Bang theory (3/4 hydrogen and 1/4 helium).

HS-ESS1-4. Use Kepler's laws to predict the motion of orbiting objects in the solar system. Describe how orbits may change due to the gravitational effects from, or collisions with, other objects in the solar system.



## Teacher Guide

1. Additional related standards.
2. Common misconceptions for age group.
3. Pre and post visit activities that tie into field trip activities.
4. Zoo activity that relates content to the animals.