

Sun, Earth, and Moon

Students will observe the Sun, Earth and Moon in natural representations using Science On a Sphere to gain an accurate view of features that characterize these systems.

Utah Core Standards

- K-2nd Science Standard 2: Earth and Space Science. Students will gain an understanding of Earth and Space Science through the study of earth materials, celestial movement, and weather.
- 3rd Science Standard 1: Students will understand that the shape of Earth and the moon are spherical and that Earth rotates on its axis to produce the appearance of the sun and moon moving through the sky.
- 4th Science Standard 2: Students will understand that the elements of weather can be observed, measured, and recorded to make predictions and determine simple weather patterns.
- 6th SEEd Strand 6.1: Structure and Motion within the Solar System
- 6th SEEd Strand 6.3: Earth's Weather Patterns and Climate

Background

Science On a Sphere is a nearly six-foot sphere suspended in the air that provides accurate, 3-Dimensional projection views of Earth and other spherical objects without the distortions that occur in flat maps. In addition to natural views, many objects and processes are also able to be seen in a variety of wavelengths throughout the electro-magnetic spectrum. Trained presenters guide students through a variety of topics. The program indicated below shows the points of focus that will be displayed as well as a caption of information that can be used to prepare students prior to their visit. Additional information will be presented during the visit and can be adapted to accommodate requests, depending on time and circumstance.

Sun, Earth, and Moon Program (individual shows may vary)

1. Sun, Helium View: Using a helium filter, the Sun takes on a slightly orange color and allows several features to be seen.
2. Sun, X-ray View: Viewing the Sun in the X-ray portion of the electromagnetic spectrum shows solar activity and spectacular views of solar flares.
3. Solar System: A scale-size comparison of the planets in the solar system and the Sun.
4. Moon: A chance to compare and characterize the many features found on Earth's nearest neighbor.
5. Moon Landings: The locations of all lunar landings are shown.
6. Moon Phases: The Moon takes 29.5 days to complete a full cycle of phases. The full transition of these phases is shown.
7. Earth, Blue Marble: Four months of observation by satellites were compiled to provide this detailed, true-color view of Earth which has become known as the Blue Marble.
8. Clouds, Real-Time: The atmosphere on Earth supports an ever-changing system of clouds that cover nearly two-thirds of the planet at any given time.
9. Earth, Nightlights: As civilizations increasingly rely on artificially generated light, the use of these at night can be clearly seen from space.

Pre-Visit Activity

Students will make model for the Sun, Earth and Moon. Using their model students will observe the motions of these objects in relation to each other and be able to describe the appearance of movement of the heavens from Earth.

Background

The Earth, Sun and Moon have a variety of characteristics that define the kind of object they are. They have specific motions that they have in relationship to each other. Modeling helps us to better study properties of something we want to understand. Modeling the Sun, Earth and Moon we can understand the motions that give us night and day as well as the appearance of motion of the Moon and Sun.

Materials (per student)

- Sun, Earth and Moon model sheet
- Paper fasteners (3)
- Colored pencils or crayons
- Writing Utensil

Timing

- Pre-Visit Activity: 20 minutes
- Planetarium Show: 20 minutes
- Post-Visit Activity: 15 minutes

Activity

1. Color the Sun, Earth and Moon on the activity sheet
2. Cut out the patterns
3. Connect the Sun to the long rectangular strip by matching up the small circles and using a paper fastener
4. Connect the Moon to the short rectangular strip by matching up the small squares and using a paper fastener
5. Connect the Earth to both rectangular strips by matching up the small “x or +” shape and using a paper fastener

Post-Visit Activity

Students will use vocabulary to describe the motions of and answer questions about the movement and relationships regarding the Sun, Earth, and Moon.

Materials (per student)

- Sun, Earth, and Moon crossword puzzle
- Writing Utensil

Activity

Fill in the answer to the clues on the crossword puzzle, using one letter of the word per box. Make sure that answers to clues match the number and follow the direction on the crossword puzzle.

Science on a Sphere
Sun, Earth, and Moon
Pre-Visit Activity Sheet



With the Sun, Earth and Moon model

Show the movement of Earth and the Moon by moving Earth around the Sun and the Moon around Earth

Describe what the movement of the Sun and Moon would appear like to a person on Earth

Questions

1. In your model, which objects are able to spin or rotate?
2. Draw a dot or stick figure on the edge of the Earth circle to show a person standing on Earth. Rotate the Earth counter-clockwise once. If you imagine yourself as the person standing on Earth, describe what you would see the Sun appear to do?
3. Draw an arrow on the Moon circle pointing from the center to the edge. Rotate the Moon counter-clockwise around the Earth once, keeping the arrow always pointing at the Earth. Does the Moon have to spin around the fastener?
4. If you imagine yourself as the person standing on Earth, describe what you would see the Moon appear to do?

Science on a Sphere
Sun, Earth, and Moon
Pre-Visit Activity Sheet



With the Sun, Earth and Moon model

Show the movement of Earth and the Moon by moving Earth around the Sun and the Moon around Earth

Describe what the movement of the Sun and Moon would appear like to a person on Earth

Questions

1. In your model, which objects are able to spin or rotate?

The Sun, The Earth, The Moon

2. Draw a dot or stick figure on the edge of the Earth circle to show a person standing on Earth. Rotate the Earth counter-clockwise once. If you imagine yourself as the person standing on Earth, describe what you would see the Sun appear to do?

The Sun rises and sets; The Sun moves across the sky

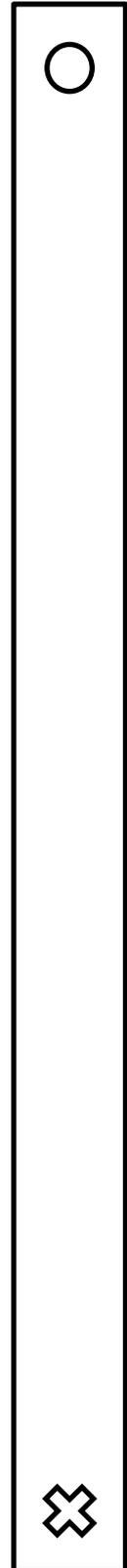
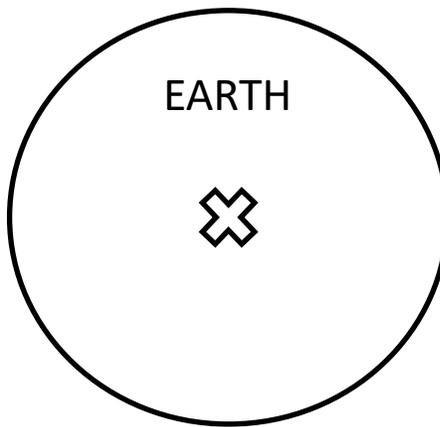
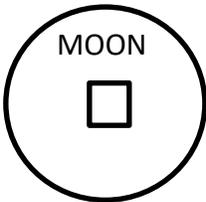
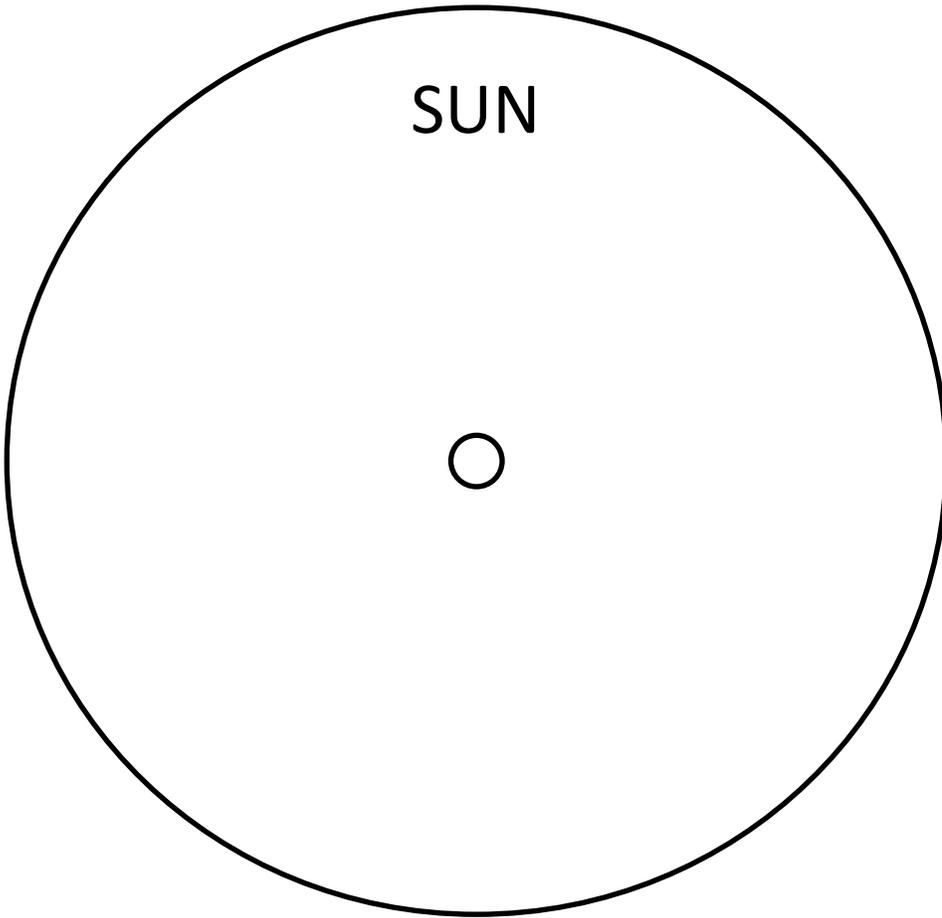
3. Draw an arrow on the Moon circle pointing from the center to the edge. Rotate the Moon counter-clockwise around the Earth once, keeping the arrow always pointing at the Earth. Does the Moon have to spin around the fastener?

Yes

4. If you imagine yourself as the person standing on Earth, describe what you would see the Moon appear to do?

The Moon rises and sets; The Moon moves across the sky; Always see the arrow on the Moon

Science on a Sphere
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Pre-Visit Activity Sheet



Sizes and distances are NOT to scale

Science on a Sphere
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Post-Visit Activity Sheet



- Across:
 1. When an object moves around another object
 2. What an object spins about
 3. The shape of the Earth
 4. How long the Earth takes to revolve once around the Sun
- Down:
 1. About how long the Moon takes to revolve once around the Earth
 2. What the Moon orbits
 3. What the Earth orbits
 4. When an object spins around its axis
 5. The shape of the Moon
 6. How long the Earth takes to rotate once around its axis

