

Utah
Middle School

Starry Night Lesson Plans
In order of relevance

Grade 6

Standard 1 Students will understand that the appearance of the moon changes in a predictable cycle as it orbits Earth and as Earth rotates on its axis.

Objective 1 Explain patterns of changes in the appearance of the moon as it orbits Earth.	A4	A3				
Describe changes in the appearance of the moon during a month.	A4	A3				
Identify the pattern of change in the moon's appearance.	A4					
Use observable evidence to explain the movement of the moon around Earth in relationship to Earth turning on its axis and the position of the moon changing in the sky.	A4	A3				
Design an investigation, construct a chart, and collect data depicting the phases of the moon.	A4	A3				
Objective 2 Demonstrate how the relative positions of Earth, the moon, and the sun create the appearance of the moon's phases.	A1-A5	B1-B2	C2	E1-E4		
Identify the difference between the motion of an object rotating on its axis and an object revolving in orbit.	A4	A3				
Compare how objects in the sky (the moon, planets, stars) change in relative position over the course of the day or night.	A1-A4	B1	C2	E1		
Model the movement and relative positions of Earth, the moon, and the sun.	A1-A4	B1	C2	E1	E3	E4

Standard 2 Students will understand how Earth's tilt on its axis changes the length of daylight and creates the seasons.

Objective 1 Describe the relationship between the tilt of Earth's axis and its yearly orbit around the sun.	A2					
Describe the yearly revolution (orbit) of Earth around the sun.	A2					
Explain that Earth's axis is tilted relative to its yearly orbit around the sun.	A2					
Investigate the relationship between the amount of heat absorbed and the angle to the light source.	A2					
Objective 2 Explain how the relationship between the tilt of Earth's axis and its yearly orbit around the sun produces the seasons.	A2	E3				
Compare Earth's position in relationship to the sun during each season.	A2					
Compare the hours of daylight and illustrate the angle that the sun's rays strikes the surface of Earth during summer, fall, winter, and spring in the Northern Hemisphere.	A2					
Use collected data to compare patterns relating to seasonal daylight changes.	A2	E3				
Use a drawing and/or model to explain that changes in the angle at which light from the sun strikes Earth, and the length of daylight, determine seasonal differences in the amount of energy received.	A2					
Use a model to explain why the seasons are reversed in the Northern and Southern Hemispheres.	A2					

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Standard 3 Students will understand the relationship and attributes of objects in the solar system.

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Objective 1 Describe and compare the components of the solar system.	B1-B2	C1-C4	D1-D3	I1-I2	
Identify the planets in the solar system by name and relative location from the sun.	B1-B2				
Using references, compare the physical properties of the planets (e.g., size, solid or gaseous).	C1	C4			
Use models and graphs that accurately depict scale to compare the size and distance between objects in the solar system.	B2				
Describe the characteristics of comets, asteroids, and meteors.	D1	D3			
Research and report on the use of manmade satellites orbiting Earth and various planets.	I1-I2				
Objective 2 Describe the use of technology to observe objects in the solar system and relate this to science's understanding of the solar system.	I1-I2	F2			
Describe the use of instruments to observe and explore the moon and planets.	I1-I2				
Describe the role of computers in understanding the solar system (e.g., collecting and interpreting data from observations, predicting motion of objects, operating space probes).	B1-B2	C1-C4	D1-D3	I1-I2	F2
Relate science's understanding of the solar system to the technology used to investigate it.	I1-I2	F2			
Find and report on ways technology has been and is being used to investigate the solar system.	I1-I2	F2			
Objective 3 Describe the forces that keep objects in orbit in the solar system.	C2	F3	G3		
Describe the forces holding Earth in orbit around the sun, and the moon in orbit around Earth.	C2				
Relate a celestial object's mass to its gravitational force on other objects.	C2	G3			
Identify the role gravity plays in the structure of the solar system.	C2	F3			

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Grade 6

Standard 4 Students will understand the scale of size, distance between objects, movement, and apparent motion (due to Earth's rotation) of objects in the universe and how cultures have understood, related to and used these objects in the night sky.

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Objective 1 Compare the size and distance of objects within systems in the universe.

G1-G3 H1-H2 B2

Use the speed of light as a measuring standard to describe the relative distances to objects in the universe (e.g., 4.4 light years to star Alpha Centauri; 0.00002 light years to the sun).

G1 H1-H2

Compare distances between objects in the solar system.

B2

Compare the size of the Solar System to the size of the Milky Way galaxy.

B2 H1

Compare the size of the Milky Way galaxy to the size of the known universe.

H1-H2

Objective 2 Describe the appearance and apparent motion of groups of stars in the night sky relative to Earth and how various cultures have understood and used them.

E1-E4 G1

Locate and identify stars that are grouped in patterns in the night sky.

E1 E2

Identify ways people have historically grouped stars in the night sky.

E2 E4

Recognize that stars in a constellation are not all the same distance from Earth.

G1

Relate the seasonal change in the appearance of the night sky to Earth's position.

E3 E4

Describe ways that familiar groups of stars may be used for navigation and calendars.

E1-E4