The Solar System (Grades 3-8)

DESCRIPTION

Launch into space in the Nathan & Fannye Shafran Planetarium and fly through the Solar System like never before! We'll view the Earth from space, float over Venus, and land on Mars to search for water. Pausing only briefly on the Sun's surface, our grand tour takes us up close and personal to the gas giants, Jupiter and Saturn. After inspecting some of the many exotic moons of the outer planets, we'll see what sunrise on Pluto looks like and then drift by an icy comet.

OBJECTIVES

- Identify any planets visible to the unaided eye in the current evening/morning sky, and name at least three constellations visible after sunset
- Name in order, from nearest to farthest from the Sun, the planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto
- Describe objects in the Solar System based upon their size and physical state
- Discuss the question: How do we know what we know about the Solar System?

OHIO'S LEARNING STANDARDS

GRADE 3

Science: Physical Science – Matter and Forms of Energy

- **3.PS.1**: All objects and substances in the natural world are composed of matter.
- **3.PS.2**: Matter exists in different states, each of which has different properties.

GRADE 4

Science: Earth and Space Science – Earth's Surface

- **4.ESS.1**: Earth's surface has specific characteristics and landforms that can be identified.

GRADE 5

Science: Earth and Space Science – Cycles and Patterns in the Solar System

- **5.ESS.1**: The solar system includes the sun and all celestial bodies that orbit the sun. Each planet in the solar system has unique characteristics.
- **5.ESS.2**: The sun is one of many stars that exist in the Universe.
- **5.ESS.3**: Most of the cycles and patterns of motion between the Earth and sun are predictable.

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GRADE 6

Science: Physical Science – Matter and Motion

- **6.PS.3**: There are two categories of energy: kinetic and potential.
- **6.PS.4**: An object's motion can be described by its speed and the direction in which it is moving.

GRADE 7

Science: Earth and Space Science – Cycles and Patterns of the Earth and the Moon

- **7.ESS.4**: The relative patterns of motion and positions of Earth, moon, and sun cause solar and lunar eclipses, tides and phases of the moon.

GRADE 8

Science: Physical Science – Forces and Motion

- **8.PS.1**: Objects can experience a force due to an external field such as magnetic, electrostatic or gravitational fields.
- **8.PS.2**: Forces can act to change the motion of objects.

Before your Program

At the museum (in house) programs:

If this will be your first trip to the Museum for some of your students, you may want to discuss the following questions:

- What is a Museum? Why are we going to the Cleveland Museum of Natural History?
- How should we handle objects at the Museum?
- Use the vocabulary and additional resources provided in this Teacher Guide to preview or review program content with your class.

VOCABULARY

comet – an icy snowball mixed with dirt that melts when it's close to the Sun

constellations – star patterns that people use to make pictures of animals, people, monsters, and other objects in the nighttime sky

crater – the mark or depression that forms when a comet, asteroid, or meteoroid hits a planet, moon, comet, or another asteroid

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galaxy – a collection of gas clouds and millions or billions of stars that can take on a spiral, elliptical, or irregular shape. The Sun is a star in the Milky Way Galaxy

meteor, shooting star – the momentary streak of light in the sky produced when a meteoroid passes through the Earth's atmosphere

meteorites – rocks from outer space that have fallen to the Earth. They are the oldest rocks in the Solar System (4.5 billion years). Some rare meteorites are from the Moon or Mars, but most come from the asteroid belt

moon – an object in an orbit around a planet or asteroid. It does not give off its own light and is usually solid

observatory – a building equipped with a telescope for viewing the real sky

orbit – the elliptical path taken by an object around a planet, star, or asteroid

planet – a large object that moves around the Sun in an orbit. It does not give off its own light and is not necessarily solid

planetarium – a machine which projects images of stars, moons, and planets on the inside of a large round room with a domed ceiling. The machine rotates to illustrate celestial movements. Also a room housing such a device

revolution – the length of time it takes an object to orbit once around a planet or star

rotation – the length of time it takes an object to spin once around its axis

stars – luminous hot balls of gas. Stars come in different sizes and colors and, just like our own Sun, they produce their own light

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ONLINE RESOURCES FOR TEACHERS AND STUDENTS

Click the link below to find additional online resources for teachers and students. These websites are recommended by our Museum Educators and provide additional content information and some fun, interactive activities to share with your class.

CMNH Educators regularly review these links for quality. Web addresses often change so please notify us if any links have issues.

Shafran Planetarium & Mueller Observatory

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