



National Park Service Rock Creek Park Planetarium Education

OUR UNIVERSE

Observe the movements of the moon, other planets, and stars in relation to Earth and the sun. Inside, watch the sun set and reveal a star covered sky. Learn about some of the most famous constellations and the myths behind them. See the night sky as though you stayed up all night long. All of these experiences, and more, are included in “Wonders of the Night Sky.”

TOPIC: Basic Astronomy

BACKGROUND INFORMATION:

Unfortunately, many inter-city children do not have the opportunity to see the full night sky. Marred by light pollution, coming from building and street lights, only a few stars can be seen.

The Rock Creek Park Planetarium enables us to display the night sky on a dome-shaped ceiling either with light pollution or free of it. The projector also controls time, so it can display stars throughout the night, slowing time down or speeding it up.

Where: Rock Creek Park Nature Center Planetarium

Length: 1 hour

Who: 4th–6th grade classes

Students per group: maximum of 70

Chaperones per group: 5 recommended

CURRICULUM MATCH:

Based on the District of Columbia Science Standard 6; Space Sciences;

- **Grade 4:** Observe the day and night sky regularly over a period of time to identify objects and describe patterns in the changes.
- **Grades 4 & 5:** Create models, drawings, or demonstrations to describe how the arrangement and objects in the solar system explain daily, monthly, and seasonal changes.
- **Grades 4 & 5:** Describe the shape and surface shading of the phases of the moon over a period of time
- **Grades 4 & 5:** Research and discuss the nature and conditions of outer space
- **Grade 6:** Design and construct models which show the relative size and position of planetary objects in the solar system
- **Grade 6:** Relate a simple model of the solar system to day/ night, time zones and year length, seasonal changes, and changes in the inclination of the sun.
- **Grade 6:** Investigate and compare the relative size, position, and motion of the moon, stars and planets.

Based on the National Science Standard D; Earth and Space Science

- **Grades 5- 8:** “As a result of their activities in grades 5- 8, all students should develop an understanding of earth in the solar system”
- **Based on the Benchmarks for Science Standard 3; Understands Essential ideas about the composition and structure of the universe and the Earth’s place in it**
- **Grades 3- 5:** Knows that the Earth is one of several planets that orbit the Sun, and the Moon orbits around the Earth

- **Grades 3- 5:** Knows the patterns of stars in the sky stay the same, although they appear to slowly move from east to west across the sky nightly, and different stars can be seen in different seasons
- **Grades 3- 5:** Knows that astronomical objects in space are massive in size and are separated from one another by vast distances
- **Grades 6- 8:** Knows characteristics of our Sun and its position in the universe
- **Grades 6- 8:** Knows characteristics and movements of the nine planets in our Solar System
- **Grades 6- 8:** Knows that the planet Earth and our Solar System appear to be somewhat unique, although similar systems might yet be discovered in the universe
- **Grades 6- 8:** Knows that gravitational force keeps planets in orbit around the Sun and moons in orbit around the planets
- **Grades 6- 8:** Knows characteristics and movements of asteroids, comets, and meteors
- **Grades 6- 8:** Knows how the regular and predictable motions of the Sun and Moon explain phenomena on Earth (day, year, Moon phases, eclipses, tides, shadow)
- **Grades 6- 8:** Knows that billions of galaxies exist in the universe, and that enormous distances separate these galaxies and stars from one another and from the Earth

OBJECTIVES: By the end of the program, students will be able to;

1. Describe two ways Earth moves.
2. Identify three celestial objects in the night sky
3. Sketch the layout of the solar system



OUR UNIVERSE PRE AND POST- TRIP ACTIVITIES

Pre- trip activities: Prior to your visit to Rock Creek Park, please take a moment to read this pre- site. The pre- trip activities may be used to introduce important astronomy related concepts. The post- trip activities are designed to reinforce the program by reviewing some of what the students learned while adding components of mathematics, language skills, art or critical issues.

Pre- site:

1. Using a copy of the star chart, ask each student to connect the stars to create pictures.
2. With the students' help, keep a record of what the moon looks like each night for at least a week, but preferably more than a month.
3. Ask each student to draw the night sky from his or her bedroom window.
4. Divide the class into groups of three or four. Assign each group the task of researching one of the planets and presenting their findings in the class.

Post- site:

1. Pass out copies of star charts and allow the children to connect the dots and recall some of the constellations presented in the program, or to create their own. Some children also enjoy creating make believe stories to go along with their constellations.
2. Astro Match from Ranger Rick (see attached)
3. Solar Scramble from Ranger Rick (see attached)
4. Math Gravity from Ranger Rick (see attached)
5. Allow each student to individually think about why a clear night sky is important to him or her. Compile their answers and write to congress or the president to voice your opinion.
6. Ask each student to look around their neighborhood and try to think of ways to lessen light pollution.
7. Have the students, either individually, in small groups, or as a class, create a model of the solar system using less than \$10 worth of supplies.