ORLANDO SCIENCE CENTER

Discovery Lab Pre-Visit Activities

Spaced Out

Grades K-2

Thank you for booking your field trip to the Orlando Science Center! As a means of preparing your students for their Discovery Lab and enhancing their experience, we are providing you with these pre-visit materials to share with your class.

Discovery Lab Objective:
Rocket your knowledge of space to infinity and beyond! Mold a scale model of the planets in our solar system, and be amazed by the distances between them. Enlighten yourself about day and night, explore the guts of a telescope, and learn about the Sun's extreme energy.

Next Generation Sunshine State Standards:
SC.K.N.1.3, SC.K.E.5.2, SC.K.E.5.3, SC.K.E.5.5, SC.K.E.5.6, SC.1.N.1.1, SC.1.N.1.3, SC.1.E.5.3, SC.1.E.5.4, SC.2.N.1.1, SC.2.N.1.2

Key Vocabulary:

- **Axis:** the imaginary line around which an object rotates (e.g., Earth's axis runs through Earth between the North Pole and the South Pole)
- **Energy:** the ability to do work or make change
- **Moon:** a natural satellite that revolves around a planet
- **Moon Phase:** the shape of the lighted part of the moon
- **Planet:** a large body in space that orbits a star and does not produce light of its own
- **Rotation:** the spinning of an object around a center point, or axis; the Earth rotates on its axis in a 24-hour day
- **Solar System:** a star and all the planets and other bodies that orbit it; the region in space where these bodies move
- **Star:** a large, gaseous, self-luminous body held together by gravity and powered by thermonuclear reactions
- **Sun:** the closest star to Earth and the center of our solar system

Key Concepts:

- The sun warms the Earth and gives off light.
- The rotation of the Earth is responsible for the repeating pattern of day and night.
- The shape of the moon appears to change throughout the month.
- Things can be big and things can be small as seen from Earth.
- Magnifiers make things appear bigger and help people see things they could not see without them.

Discussion Topics:

- The Sun is a star, and it supplies the Earth with light and heat energy. The stars look like twinkling points of light—except for the Sun.
  Why don't all stars look alike?
- Earth, our home planet, is one of eight planets in our solar system and the only planet we know to be capable of sustaining life.
  What characteristics of our planet contribute to its ability to sustain life?
- The moon is the brightest object in the night sky, but it does not make its own light. The light we see comes from the sun and bounces off the moon.
  When viewed from the Earth, does the moon always look the same?

In Class Activities:

- You can easily and safely observe the Sun using a pinhole camera—a simple device which projects an image of the Sun through a tiny hole onto a screen. To build a pinhole camera, you will need two sheets of stiff, white paper, a pin, and a sunny day! With a pin, punch a small hole in the center of one of the sheets of paper. With the Sun behind you, hold the two sheets of paper in your hands. The rays of the Sun will pass through the pinhole and project on to the second sheet of paper (the screen). Move the screen until the image is centered and in focus. What you are seeing is an actual image of the Sun!
- Discover why the moon appears to glow brightly in the sky using only a flashlight and a small mirror (roughly 4 in. x 4in. in size). Darken the room as much as possible and turn the flashlight on. Is the flashlight producing anything? *[Yes. The flashlight is a producer of light.]* With the room still darkened, turn off the flashlight and observe the mirror. Is the mirror producing light? *[No. The mirror is not a producer of light.]* Turn the flashlight back on and shine the flashlight beam onto the mirror from a distance of 6 in.-12 in. Position the mirror so that it shines onto the face of another person. Did the face of this person "light up"? *[Yes.]* Where did it look like the light was coming from? *[The mirror.]* Our earlier test, however, showed us that the mirror is *not* a producer of light. The only light producer in this experiment is our flashlight. How did the light get from the flashlight to the person's face? *[The light left the flashlight and bounced off the mirror onto the person's face. When light bounces off something, we call this reflected light. The mirror is a light reflector.]* Stars, like our Sun, are light producers. Other objects in space, such as the planets and moons, are light reflectors.
- Simulate the motion of the planets by performing a solar system ballet. Assign one student to be the Sun and another eight students to be the planets. Place the Sun in the center of a large outdoor area or gymnasium. Space the planets in orbits around the Sun. When given a signal, all of the planets should start orbiting the sun at the same time and at the same speed. Students will notice that some of the planets travel around the Sun before others. Why do some planets take longer to orbit the Sun?

Additional Resources:

http://www.space.com/
http://www.kidsastronomy.com/
http://www.windows2universe.org/
http://spaceplace.nasa.gov/en/kids/