ORLANDO SCIENCE CENTER

Discovery Lab Pre-Visit Activities

Space Tech: The Next Generation

Grades 3-5

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.3.N.1.1, SC.3.N.1.3, SC.3.N.3.2, SC.3.N.3.3, SC.3.E.5.1, SC.3.E.5.2, SC.3.E.5.3, SC.3.E.5.5, SC.3.P.10.2, SC.3.P.11.1, SC.4.N.1.1, SC.4.E.5.3, SC.4.E.6.5, SC.4.P.10.2, SC.5.N.1.1, SC.5.E.5.1, SC.5.E.5.2, SC.5.E.5.3, SC.5.P.10.2

Key Vocabulary:

- **Axis:** the imaginary line on which an object rotates (e.g., Earth's axis runs through Earth between the North Pole and the South Pole)
- **Equator:** an imaginary circle around Earth's surface located between the poles and a plane perpendicular to its axis of rotation that divides it into the Northern and Southern Hemispheres
- **Revolution:** the orbital motion of one object around another; the Earth revolves around the Sun in one year while the moon revolves around the Earth in approximately 28 days
- **Rotation:** the turning motion 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

Key Concepts:

- The Earth revolves around the Sun in a year and rotates on its axis in a day.
- The Sun is a star that emits energy in the forms of heat and light.
- Energy has the ability to cause motion or create change.
- The inner planets of our solar system are smaller in volume than the outer planets.
- The distances between the inner planets of our solar system are shorter than the distances between the outer planets.
- Technology and tools help to extend the ability of humans to observe very small things and very large things.

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?
- Kennedy Space Center, located on the east coast of Central Florida, has served as the launch site for every American manned mission to space and for hundreds of scientific spacecraft.
  How has space research and exploration at Kennedy Space Center effected the economy and culture of Florida?

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 white sheet of paper. To build your pinhole camera, all you will need is 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 not just a dot of light coming through the hole, but an actual image of the Sun! Experiment by making your hole larger or smaller. What happens to the image?
- Simulate the effects of the atmosphere on our ability to view objects in space using a paper towel tube and bubble wrap. Wrap a piece of bubble wrap around the end of a paper towel tube (with the bubbles facing out) and secure it with a rubber band. Observe a mystery object or picture through the bubble wrap "atmosphere" on your paper towel tube "telescope". What do you notice? What kind of detail can you see? The bubble wrap distorts our view, making objects appear blurry. The atmosphere has a similar effect upon our ability to view space objects from Earth. By placing telescopes in space, astronomers have been able to overcome the distorting effects of the Earth's atmosphere and record details and images that could never be observed from Earth.

Additional Resources:

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