

# Discovery Lab Pre-Visit Activities Forces of Nature 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:**

Our planet, Earth, is full of wonder. It is a living sphere – continuously in motion and constantly changing as a result of the many forces of nature. This Discovery Lab will take you on a journey to discover some of these forces of nature. You will have the opportunity to delve into a vicious volcano, find out how our planet is changed during erosion, and explore the fast winds of a hurricane.

#### **Next Generation Sunshine State Standards:**

SC.3.N.1.1, SC.3.N.1.2, SC.3.N.1.3, SC.4.N.1.1, SC.4.N.1.2, SC.4.N.1.5, SC.4.N.1.6, SC.5.N.1.1, SC.4.N.1.8, SC.3.N.3.2, SC.4.N.3.1, SC.3.E.5.4, SC.4.E.6.4, SC.4.E.6.6, SC.5.E.7.3, SC.5.P.9.1, SC.5.P.13.1, SC.5.P.13.2, SC.5.P.13.3, SC.5.P.13.4

#### **Common Core State Standards:**

LACC.3.RI.1.I, LACC.3.RI.2.4, LACC.3.RI.3.7, LACC.3.W.1.2, LACC.3.W.3.7, LACC.3.SL.1.I, LACC.4.RI.2.4, LACC.4.RI.1.I, LACC.3.SL.1.3, LACC.4.RI.3.7, LACC.4.W.1.I, LACC.4.W.1.2, LACC.4.W.3.9, LACC.4.SL.1.I, LACC.4.W.3.7, LACC.5.RL.1.I, LACC.5.SL.1.I, LACC.5.RI.2.4, LACC.5.W.1.2, LACC.5.W.3.7, LACC.5.W.3.9, LACC.5.RI.1.3, MACC.3.MD.1.1, MACC.3.MD.1.2, MACC.4.MD.1.2

# **Key Vocabulary:**

- Weathering: the process in which rocks are broken down by the action of rain, frost, wind, and other elements of the weather.
- **Erosion:** the movement or transportation of broken-down material from one place to another.
- **Volcano:** mountain with a vent that connects to a reservoir (lake) of molten (melted and really hot) rock. When gas pressure under the surface of the earth and inside the volcano builds up enough, the volcano will erupt.
- Chemical reaction: a reaction in which a chemical change occurs. A chemical change creates a new substance.
- Hurricane: a big storm up to 600 miles across that has strong winds spiraling inward and upward at speeds of 75 to 200 mph.
- **Gravity:** force that pulls things together.
- Air resistance: the force of air pushing against an object.

### **Key Concepts:**

- Weathering, which can be mechanical or chemical, is the process in which rocks are broken down by the action of rain, frost, wind, and other elements of the weather.
- Erosion involves the movement or transportation of broken-down material from one place to another.

- Volcanoes have vents (like a tube) that connect to reservoirs (lakes) of molten (melted and really hot) rock. When gas pressure under the surface of the earth builds up, the volcano will erupt.
- A hurricane is a big storm up to 600 miles across that has strong winds spiraling inward and upward at speeds of 75 to 200 mph.
- Scientists design and build weather instruments that monitor wind speed, wind direction, and pressure to make forecasts for severe weather such as hurricanes.

## **Discussion Topics:**

- The Earth's surface is continuously shaped by the processes of weathering and erosion.

  How is erosion different from weathering? Where on Earth can we see evidence of erosion?
- Volcanoes erupt when pressure underneath the surface builds up and is released.
  What causes pressure underneath the surface to build up? When does an eruption stop?
- Hurricanes gather heat and energy through contact with warm ocean waters. Why do hurricanes increase in strength over warm waters?

## In Class Activities:

Download a hurricane tracking map from (http://www.nhc.noaa.gov/pdf/tracking\_chart\_atlantic.pdf) and have students use the information from the table below to plot the path of Hurricane Katrina in 2005. Hurricanes are classified according to their wind intensity on the Saffir-Simpson scale. This I-5 scale is a great tool for forecasters and governmental officials when alerting the public about possible impacts and damages associated with these storms. Have students identify what type of storm Katrina was on each date and write a possible forecast that might have been issued accordingly for each of those days.

Date	Longitude	Latitude	Wind Speed
8/23/2005	23° N	75° W	30 mph
8/24/2005	25° N	77° W	40 mph
8/25/2005	25° N	80° W	75 mph
8/26/2005	24° N	83° W	100 mph
8/27/2005	24° N	85° W	II5 mph
8/28/2005	27° N	89° W	175 mph
8/29/2005	31°N	89° W	I50 mph

The following activity will explore beach erosion. You will need the following supplies; a cake pan, water, sand, and a ruler. Fill the cake pan until the bottom is covered by about 3 cm of water and let it stand until the water is still. Add sand to one end of the cake pan until it rises above the water. Have a student measure the height of the sand. Students draw the profile of the 'beach' (what it looks like from the side). Have another student use the side of the ruler to generate small and steady waves in the tray for about 15 seconds. Have the students observe any changes to the 'beach'. Have a student measure the height of the sand. Students draw the profile of the new beach.

#### Additional Resources:

http://www.weather.gov/

http://www.weatherwizkids.com/

http://www.education.noaa.gov/

http://www.nhc.noaa.gov/