Science

Craters and Climates

Purpose:

- Create a crater on a planet surface model
- Observe the difference in impact on a crater model by varying the height from which an object is dropped
- Predict and observe the effects of rain on craters
- Discuss how other weather conditions may alter craters on planets
- Demonstrate that science is fun

Activity 1: Creating a Crater

Supplies (for each group of 2 - 4):

- Newspaper or plastic to cover work surface
- Small disposable bowl
- Powdered sugar (to fill bowl 4 cm deep)
- Shaker filled with cocoa powder
- Small rock to serve as an asteroid (you may want to have a different size rock for each group so the participants can observe how asteroid size can affect craters)
- Metric tape measure

Work in groups of 2 to 4. Cover work surface with newspaper or plastic. Each group can make a planet surface model by filling a bowl with powdered sugar to 4 cm deep. Sprinkle a layer of cocoa powder on the sugar to create a dark stratum (geological layer of sedimentary rock). Hold a small rock (simulating an asteroid) 1 meter above the planet surface model and drop for impact. Carefully remove the asteroid and observe the impact crater. Have youth describe what would happen if the asteroid is dropped from a greater height. Repair planet surfaces by jiggling and smoothing, and recreate a stratum of darker rocks with sprinkled cocoa. Then test these new predictions. This time, drop the rock asteroid from a 2 meter height.

Discussion:

1. What planet surface clues would help a space geologist, find an asteroid crater?
   Answer: Material splashed around a crater from the impact of an asteroid (called ejecta), rim of crater, etc.
2. What happened when the impact height of the asteroid was greater?

Activity 2: Can Climate Affect Craters?

Supplies (for each group):

- Crater model from Activity 1, above
- Spray bottle containing water

Ask participants to predict how rain will change their craters. Ensure that each group's spray bottle is adjusted to create a fine spray. Holding the bottle at least 30 cm away above the crater model, spray the crater 6-10 times or until there are a few puddles around the crater. Have each group member list two observations of what is happening to the crater's surface as it rains.

Discussion:

1. How do the participant observations compare to their predictions?
2. Consider how other weather events such as wind would affect craters.

Adapted from: Wonderwise Space Geologist http://wonderwise.unl.edu/

2 activities for grades 3-6. Allow 50 minutes. Science Standard – Earth and Space (Geology)