Praxis "Making Science Fun"

Making Craters?

How does the size, angle, and speed of a meteoroid's impact affect the properties of craters?

Materials:

- Basin
- Cocoa
- Flour
- Pebbles or marbles

Procedure: (Remember to be sure to have your parent's permission and they have the time to watch and help you.)

- Put about 4-5 cm of flour in a basin and sprinkle a little cocoa on the surface. This will make the changes more noticeable. Gather three different sizes of pebbles or marbles; these are the "meteoroids."
- Record your observations on a data chart for each crater you create.
- Pick out one of the smallest meteoroid and drop (not throw) it from about eye level into the basin.
- Predict the appearance of a crater formed by a larger meteoroid.
- Then drop a medium size and then the largest meteoroid from the same height.
- What is the relationship between meteoroid size (mass) and crater size?
- Pick out three meteoroids of the same size. Smooth over the flour and sprinkle on cocoa.
- Predict the appearance of a crater formed by a meteoroid of the same size dropped at successively higher levels (higher speeds). Test your hypothesis.
- Smooth the flour and sprinkle on more cocoa. Throw a medium-sized meteoroid with moderate force vertically into the basin.
- Predict the appearance of a crater if the meteoroid strikes the flour at an angle and how the shape changes as the angle increases. Try it.

What's happening?

You would normally expect the crater to have an oblong shape on extremely wide-angle impacts. But all craters on the Moon and Earth are mostly circular. The meteors crash with tremendous force causing an explosion and the associated forces are always spherically symmetrical.

The Eagle Butte road travels through an impact crater near Elkwater. Once you know where to look the circle pattern is obvious however the impact occurred so long ago that the ridges of the crater lip have eroded to look like the surrounding hills:
http://www.lpi.usra.edu/science/kring/epo_web/impact_cratering/World_Craters_web/northamericacraters/EagleButte.html

Extension:

For experiments like this see: http://cse.ssl.berkeley.edu/AtHomeAstronomy/index.html

This experiment is based on our "Astronomy and Sky Science" Learning Kit. Our teaching kits are loaned out FREE to provide classroom teachers and parents of home schooled children an opportunity to explore Science in interesting ways. Please consider volunteering to speak to a class about any one of our Science learning kits described on our website.

On January 30th, Praxis will be hosting Operation Minerva, a conference for grade 9 girls, that promotes Science, Technology, Engineering and Mathematical (STEM) based careers where students job shadow and attend workshops. Please see our website for more details. If you are a business or organization who wishes to support this conference, please contact us.

Lorne Cooper, Regional Executive Director

PRAXIS, "Making Science Fun". Contact Praxis at praxis@praxismh.ca, www.praxismh.ca, Tweet or follow us @ PraxisMedHat, or friend us on Facebook. Address: c/o 200 7th Street S.W., Medicine Hat, AB, T1A 4K1 Phone: 403-527-5365, Fax: 403-527-6570.