

# THE BARRINGER METEORITE CRATER

[www.barringercrater.com](http://www.barringercrater.com)

## Student Handout 3: Observing Impacts

Student Name:

Date:

### Instructions

This activity will allow you to study 3 different simulations related to impacts. The first one is a slow-motion video of a red drop of water hitting a surface. The second and third simulations, developed by Dr. Elisabetta Pierazzo, Planetary Science Institute, AZ, depict land and ocean impact . Follow the directions carefully to complete the assignment.

### A. A Red Drop of Water in Slow Motion

Go to this link: <https://www.youtube.com/watch?v=CJ-AX1GoSmY>

Watch the video several times without stopping and observe what happens.

Now, **stop** the video at the designated times below and record your observations. Describe in your own words what you see.

**0:02**

**0:03**

**0:04**

**0:05**

**0:06**

**0:08**

**0:12**

**0:16**

**0:19**

**0:22**

**0:25**

## **B. Asteroid Hitting Land**

- Download the video: <http://www.psi.edu/explorecraters/A1.avi> (AVI, 6.5 Mb)
- Click on “Simulation A1” to download the video
- Watch the video several times without stopping and observe what happens.
- Now, stop the video at the designated times below and record your observations. Describe in your own words what you see.

**0:40**

**1:00**

**3:00**

**5:00**

**7:00**

**9:00**

**12:00**

### **C. Asteroid Hitting the Ocean**

Download the video: <http://www.psi.edu/explorecraters/A2.avi> (AVI, 5.9 Mb)

Watch the video several times without stopping and observe what happens.

Now, stop the video at the designated times below and record your observations. Describe in your own words what you see.

**0:40**

**1:00**

**3:00**

**5:00**

**7:00**

**9:00**

**12:00**

## Reflections

Use your observations to answer these questions. You may want to go back and run the simulations all the way through **very slowly**.

1. Explain what happens to the impactor in each of the simulations – were the results the same? Why or why not?
2. Describe any differences you observed in the size of the craters in each of the simulations.
3. Was the action of the ejected material the same or different in the water drop simulation compared to the asteroid hitting the land and ocean? Explain your answer.
4. Was the movement of waves the same in all simulations? Explain your answer.
5. Were the angles of impact the same in all simulations?
6. Scientists use models to help us understand what happens to materials as the result of an impact. How did these simulations help you to understand impacts?
7. All models have limitations. Name one thing these simulations could not do.

## **Slideshow: Stages of Crater Formation by Dr. Carolyn Ernst**

**Listen to how the scientist Dr. Carolyn Ernst describes the stages of an impact event. Take notes on the 3 impact stages and scientific vocabulary.**

1. Compact/Compression Stage

rarefaction

ejecta

2. Excavation Stage

ejecta curtain

transient cavity

3. Modification Stage

ejecta blanket

breccia