

The title of this Student Text is
“Contact and Compression Phase of Cratering”

Tactile Cards 9b through 9d should be observed in sequence. These represent the first phase of cratering, called the contact and compression phase.

Card 9b shows the contact stage of cratering, where a hypervelocity projectile contacts the surface.

Locate the large untextured oval in the dotted region near the bottom of the card. This oval represents the projectile.

As the projectile travels at a high velocity it leaves a vacuum path or a void in the atmosphere behind it. Find a solid line that is located up and to the right of the projectile.

Track the outline formed by this solid line. It appears to come to a point and then goes back down. This line outlines the vacuum path or void formed by the projectile.

Inside the void you will feel an arrow pointing in the direction that the projectile is moving.

This arrow represents the energy that the projectile contains as it approaches the surface.

Now observe Image 9c that shows what happens when the projectile collides with the surface. Find the oval in 9c.

You will feel three arrows inside the oval pointing in different directions. These arrows represent the energy transferred from the projectile to the surface.

This energy transfer causes a shock wave, an energy front that moves through the rock at supersonic speeds, structurally altering the rock. The impactor can be vaporized by the energy carried by a shock wave.

The compression of the surface pushes solid material around the side of the impact at high velocity.

Image 9d illustrates the completion of the compression stage. This stage is considered over once the projectile has stopped moving.

Observe the oval in 9d. As indicated by the arrows, the shock wave travels into the surface and rebounds.

Describe how energy is transferred in this stage of compression by describing the number and direction of the arrows. Record your responses on your student sheet.