

**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 find 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.**