

A Word About Making Chipped-Stone Tools

Some of the most familiar types of Native American tools – like arrowheads and spear points – belong to a class of tools archaeologists call **chipped stone**. Native peoples made chipped-stone tools by chipping or striking rocks like flint and chert. These brittle rocks break with sharp edges, making chipped-stone tools ideal for slicing, cutting, drilling, engraving, scraping, and other tasks.

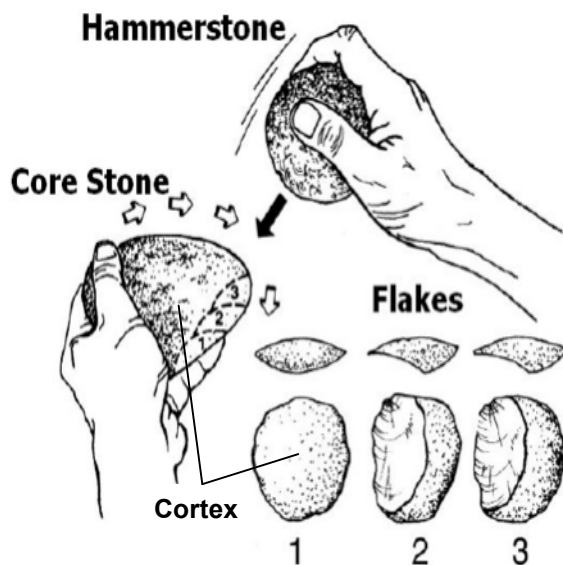
Process

Making a chipped-stone tool is called **flintknapping** or **knapping**. Like other native technologies, knapping is a lengthy, complex process. To be successful, knappers must have extensive knowledge in

- geology (rock types and where to find them);
- geometry (angles to hit the rocks); and
- physics (how forces pass through rocks).

Knapping also requires great skill. Like an artist, knappers can “see” the tool “inside” the rock. They must use the right tools in the right sequence to create a new tool.

The first step is to find the proper raw material. Native peoples mined chert and flint from limestone, collected it from streambeds, and dug it out of the soil. This unworked raw material is called the **core**.



The first flake removed from the core has one surface covered with cortex. The next flakes have less cortex.

The second step involves removing the outer, weathered layer of the core. This **cortex** is poor quality and does not break with sharp edges. It must be removed. The knapper uses a rounded, durable rock called a **hammerstone** to strike the core and remove the cortex.

Then the knapper has two choices for creating a tool. The knapper can shape the core into a **core tool** by chipping its edges. Examples of core tools are scrapers, choppers, and hoes.

The knapper can remove a large piece from the core and make this **flake** into a **flake tool** to be used “as is.” Or, the knapper can remove small flakes to shape the large flake into an arrowhead, knife, or drill. Most of the chipped-stone tools that archaeologists find in Kentucky are flake tools.

Refurbishing is the last step in the knapping process. Through use, chipped-stone tools become dulled or may break. A knapper will resharpen the edges of dulled tools and rework broken tools into new ones. For example, it was common for native knappers to rework broken spear points into hide scrapers, like the one pictured. Note how the knapper modified the pointed end of the spear point into the blunt working edge of the scraper. The base of the new tool remains the same.



This spear point was made 6,000 to 9,000 years ago.



Information From Tools

Chipped-stone tools help archaeologists answer many questions about past peoples.

Because the shapes of spear points and arrowheads change through time, these tools can show when people lived at a site. The amount of tool refurbishing shows whether or not knappers had to conserve raw materials. Tool shapes reveal the types of activities – like hunting, butchering, hide tanning, and whittling – people did. Patterns of microscopic scratches and pits on tool edges also indicate tool functions. Plus, the **microwear** patterns reveal the types of materials – wood, bone, antler, shell, and meat – that people processed with the tools.

Information From Knapping “Waste”

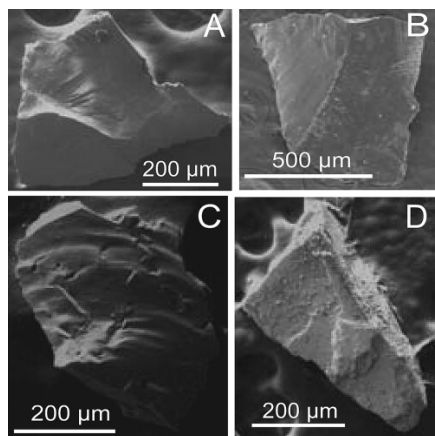
During chipped-stone tool making, the knapper produces flakes and chips, called **debitage**. Although stone tools might appear more interesting, debitage is what archaeologists find most often. At some prehistoric sites, debitage is the *only* type of artifact they find.

Knappers may consider debitage simply a knapping “waste” product. But to archaeologists, a wealth of information is hidden in debitage. The types of flakes show what steps in chipped-stone tool production took place at a site and what techniques and tools the knappers used. The raw materials tell about peoples’ movements across the land. Archaeologists can even tell if a knapper was right-handed or left-handed by studying debitage!

Flakes and other debris that are smaller than one millimeter (1/25 inch) in size are **microdebitage**. Archaeologists use screens with very small openings to collect microdebitage. In the lab, they use microscopes to study these tiny pieces of chert and flint.



For each stone tool made, hundreds of flakes are chipped off the core.



Microdebitage research is an important part of archaeology. Water, plowing, and other processes are less likely to move these tiny artifacts from their original locations than large artifacts. Therefore, archaeologists use microdebitage to identify the places knappers worked or where they threw away their waste. Archaeologists use microdebitage to identify the kinds of activities that occurred inside structures. There is a great deal to learn under the microscope!

*(A-C) Magnified views of microdebitage from archaeological sites show sharp edges, flake scars, and smooth surfaces with ripples called **conchoidal fractures**. (D) In contrast, natural rock under the microscope looks dull with pitted surfaces (Sonnenburg et al. 2013).*

To see flintknappers in action, check out two YouTube videos. “Basic Flint Knapping” shows basic raw materials and terms related to knapping. www.youtube.com/watch?v=nyuzh1uaSf4&feature=related “Flintknapping: Clovis Ch. 1” shows the initial steps in making a Clovis point, a spear point used in the Americas about 11,500-10,000 years ago. www.youtube.com/watch?v=TkoIEIi2Lrg&feature=related