Name _____

CHAPTER 2 / Analyzing Archaeological Artifacts

How do archaeologists date artifacts? One way is through *obsidian hydration dating.*

Obsidian is the volcanic glass that was sometimes used as raw material for the manufacture of stone tools. Obsidian is found in the western United States, Alaska, Central America, and elsewhere. When an archaeologist has identified the source of the obsidian from which an artifact is made, he or she may be able to date the artifact using the obsidian hydration technique. This technique of dating obsidian artifacts measures the microscopic amount of water absorbed on freshly broken surfaces. The principle behind obsidian hydration dating is simple—the longer the artifact surface has been exposed, the thicker the hydration band will be. (from nps.gov)

Try it

You are an archaeologist who is working at two sites in the same general area. The following hydration formula for the area of your dig has been established.

OBSIDIAN HYDRATION FORMULA

Where Y is the computed date of an obsidian artifact, and x is the hydration rind measurement in microns: $Y=43.58 + 158.16 (x^2—x)$. For example, if an artifact has a hydration rind of 1.8 microns, then:

$Y=43.58 + 158.16 (1.8^2—1.8)$
$Y=43.58 + 158.16 (3.24—1.8)$
$Y=43.58 + 158.16 (1.44)$
$Y=43.58 + 158.16 \times 1.44$
$Y=43.58 + 227.75$
$Y=271$

The artifact is 271 years old.

Using the formula and a calculator, compute the age of the following artifacts:

Site 1

Obsidian arrow point with a hydration rind of 1.6 Age of artifact _____

Obsidian knife with a hydration rind of 1.9 Age of artifact _____

Obsidian scraper with a hydration rind of 1.95 Age of artifact _____

Site 2

Obsidian arrow point with a hydration rind of 1.5 Age of artifact _____

Obsidian flake with a hydration rind of 1.6 Age of artifact _____

Obsidian knife with a hydration rind of 4.6 Age of artifact _____

Obsidian spear point with a hydration rind of 8.3 Age of artifact _____

What are the differences between these two sites based on the age of the artifacts found there?

Exercise adapted from *Montana Ancient Teachings: A Curriculum for Montana Archaeology and Prehistory* (Helena: Montana Historical Society, 1997)