

LESSON PLAN: CLASSIFICATION, DISTRIBUTION, AND HYPOTHESIS FORMATION USING WYOMING PROJECTILE POINT DATA

Objective

In this study of projectile point type distribution across Wyoming, the students will:

- 1) Use the University of Wyoming Archaeological Repository GIS website to research projectile point distribution
- 2) Make distribution maps of various point projectile point types across Wyoming
- 3) Communicate the results of their website queries with the group
- 4) Discuss and ask questions as to why they think certain types of points occur in different areas or appear across the state
- 5) Develop a hypothesis and testing method for researching a particular point type distribution

Age Level: Grades 8-12

Materials:

For each student or group of students, you will need a computer terminal and access to a printer, colored pencils or markers, and a notepad.

Vocabulary:

Projectile point: *An object that was hafted to a projectile like a spear or arrow shaft*

Hafting: *Process by which an artifact is attached to a haft like a handle or shaft*

Classify: *To systematically arrange artifacts into groups based on an established criteria of attributes*

Attribute: *any particular characteristic of an artifact such as shape, color, size, etc.*

Distribution: *The geographic range or place where any item or category of item occurs*

Background:

A basic element of thinking archaeologically is through classification. Classification helps us to cope with complexity and only look at certain attributes that are pertinent to the scientific questions at hand. It would be impractical to study house cats by evaluating every attribute we can think of to describe each individual house cat. Instead, we know that all house cats share certain attributes within a range of variation. By sorting house cats into groups based on a specific attribute, like color, and ignoring attributes that may not be important to our study, we can start to understand that range of variation which is particular to one inquiry or research question.

This is the basis of archaeological classification, too. We place objects, including projectile points, into categories based on attributes so we can better conceptualize and understand the prehistoric world. Since points are made out of stone, they can survive a long time in the ground and tend to be fairly plentiful because people were always making new ones as the old ones broke and were discarded. There are a myriad of varieties of points in North America and in Wyoming which vary by size

and shape and even intended use. Archaeologists don't call projectile points "arrowheads" since some points were meant to be hafted to spears or darts or knives.

A group of attributes that occur together on many different points define a particular "type" of point. These can be attributes like side-notched, lanceolate shaped, or parallel flaking pattern. Archaeologists give these point types names like Clovis, Folsom, or Agate Basin. Furthermore, particular point types tend to be found within a certain geographic range and in a particular time period. When we map the distribution of point types across an area, we are able to visualize the point type distributions. Point type distributions are often used to study the ranges of groups of prehistoric people since we assume people belonging to a particular group would have used the same types of artifacts including point types. Therefore, point types are one type of classification scheme which help archaeologists study the cultural history and spread of prehistoric peoples.

In other studies, archaeologists will come up with different classification schemes to help examine other questions, like trade or exchange or group movement. The types of rocks used to make points are often able to be sourced to particular areas where they were quarried. For instance, a golden-yellow colored chert comes from eastern Wyoming, while a deep red chert is often found in the Big Horns. Locations where these rocks are found are called "chert sources". An archaeologist would classify his or her points based on a chert source when they were examining questions pertaining to trade or interregional interaction.

An archaeologist's classification scheme is directly related to their hypothesis as it will change with each new question and area of research. Questions investigating use of prehistoric tools would classify based on a completely different set of attributes. There is no one "correct" classification in archaeology.

Procedure:

- 1) Use the UWAR database to find examples of these point styles by searching the Diagnostic Name Column: Clovis, Alberta, Elko, McKean, Oxbow, Mallory, Yonkee, Rose Springs, Besant, and Tri-notched. [Note: Other point types can also be found on the UWAR database. Teachers can choose as many or as few examples as necessary for the class. Teachers can assign students to do every type, or assign individual students their own type.]
- 2) Print off a picture of each type.
- 3) Divide students into groups. Ask them to determine what attributes they think were used to characterize that point type. Have them write it down and share it with the class.
- 4) Next, have the students plot the distributions of each point type on the University of Wyoming Archaeological Repository GIS webpage. The dots each represent the location of where one point of the particular type was found across Wyoming.
- 5) Print off a state-wide map of every point distribution.
- 6) When students have finished, ask them to determine the distribution of each point type by drawing a circle around the point type distribution. What point types are found with limited areas in the state, and what points are found all over the state?

- 7) Have the students share their results and tell the class where the different point types are found.
- 8) Ask the students to discuss and come up with explanations for why different point types would be found with different distributions. What would cause the patterns- groups who reside in different areas, groups moving between different areas, multiple different groups of people who used the same point style over a wide area, or perhaps even trade and exchange? It is important to stress there isn't a perfectly right answer. Archaeologists need to test their theories before they can be sure something can be explained how they think it should be- see Procedure #8.
- 9) Using their explanations from Procedure # 7, ask the students to come up with a hypothesis question and a means of testing their theory on a particular point distribution. For example, "My hypothesis is that the distribution of Mallory points is caused by one group of people who lived in one area. I plan on testing this hypothesis by evaluating other types of artifacts also found with Mallory points to see if they have the same distribution." Or, "My hypothesis is the Clovis point distribution is caused by group movement across wide areas. I plan on testing this hypothesis by classifying the chert sources used in Clovis point manufacture and comparing the source locations to where the points were found by archaeologists."

Wyoming Educational Standards Met

Social Studies

SS8.2.3/SS12.2.3: Compare, contrast, and evaluate how the unique characteristics of various groups within Wyoming and the nation.

SS8.4.2: Describe how tools and technology in different historical period impacted the way people lived, made decisions, and saw the world.

SS8.4.5: Identify relevant primary and secondary sources for research. Compare and contrast treatment of the same topic in several primary and secondary sources.

SS12.5.1: Use geographic tools and reference materials to interpret, analyze, evaluate, and synthesize historical and geographic data to demonstrate and understanding of global patterns and interconnectedness.

SS8.6.3/SS12.6.3: Use digital tools to research, design, and present social studies concepts

Science

SC8.2.1/SC11.2.1: Students research scientific information and present findings through appropriate means.

SC8.2.2/SC11.2.2: Student use inquiry to conduct scientific investigations

SC8.2.3/SC11.2.3: Students clearly and accurately communicate the result of their own work as well as information from other sources

SC8.2.4/SC11.2.4: Students investigate the relationships between science and technology in meeting human needs.