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The following lessons were created by **Richard Neves**, a teacher participating in the National Endowment for the Humanities Summer Institute for Teachers entitled Touch the Past: Archaeology of the Upper Mississippi River Region.

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### **Using GIS to Introduce Archaeology, Social Structures, and Climate Change**

GRADE LEVELS: Grade 8, Grade 9 and Grade 11

SUBJECTS: Earth Science, Physical Science and Environmental Science

#### OBJECTIVES:

*Earth Science:* To introduce climate change, glaciation, and migration – both megafauna and human.

*Physical Science:* To help students understand that the atlatl, flint knapping, and arrow-making were important components of prehistoric human technology.

*Environmental Science:* To introduce students to Archaeology, and to demonstrate how they may make use of GIS technology to conduct and exhibit research, and to map some of the Archaeological sites in Eastern Idaho.

STANDARDS: 1. Students will become competent in the use of GIS technology  
2. Students will understand the mechanisms of organic evolution  
3. Students will understand the impact of climate change on organisms, ecosystems, and human cultures.

DURATION: In my earth science and physical science classes I will allow one class period. In my environmental science class I will allow two weeks (8 class periods)

MATERIALS: Thanks to the Institute I have obtained examples of arrowheads and spear points to use with my Earth Science and Physical Science classes. I plan to also obtain an atlatl if possible. For my Environmental Science class I already have the computers, soft ware, internet connection, and data sources that will be required.

VOCABULARY: I routinely use a crossword puzzle program to teach vocabulary, and I plan to make use of the attached crossword puzzle for that purpose.

BACKGROUND: Prior to initiating this project I will have introduced students to GIS and they

will have completed a basic ArcView exercise. They will also have a working knowledge of using Inside Idaho and other web resources to obtain GIS data. During previous science classes students have used to use a GPS receiver to obtain tracks and waypoints. Since I am the only science teacher in the school it is highly unlikely that any other teachers will make use of this project. There is also a very low probability that future teachers will have the GIS training to make use of this project.

**SETTING THE STAGE:** Since I have previously taught all of the students who will be involved in this project, to some extent the stage has already been set. They are all aware that I planned to be involved in the Institute this summer, so they are already somewhat prepared. If possible, I plan to obtain a copy of The History of La Crosse DVD to show students and to bring any new students up to speed.

**PROCEDURE:**

*Earth Science:* I will use the information I have obtained from the Institute to introduce my discussion of climate change, the various glacial episodes that have impacted the North American continent, and how the glaciers influenced megafauna and human migration.

*Physical Science:* Use of the atlatl, flint knapping, and arrow-making will be a valuable addition to my unit on simple tools.

*Environmental Science:* I will introduce the unit by first reviewing GIS with students, and having them complete a basic “Introduction to GIS” exercise. I will then use the GIS project I have prepared for the Institute to introduce Archaeology, and how it has contributed to our understanding of the prehistoric environment that humans inherited.

I will then ask students to plan and complete a project that will involve collecting data (both tracks and waypoints) with GPS receivers, to download the data to the ArcView program, and search for appropriate basemap data. Students will then obtain appropriate photos and hyperlink them to the waypoints they previously collected.

The final stage of the project will be for students to use ArcMap to produce a poster illustrating the important components of their project. The poster must include a title, explanatory text, a north arrow, a legend, and a scale bar as well as other enhancements to make the poster interesting and attractive.

**CLOSURE:** Student projects and posters will be presented to the class.

**EVALUATION:** Students will have met my objectives when they complete the interactive portion of their project, and when they successfully produce their poster. All posters will be judged, and the three winning posters will be printed in large format and entered into the World GIS-Day competition at Idaho State University in Pocatello, Idaho.

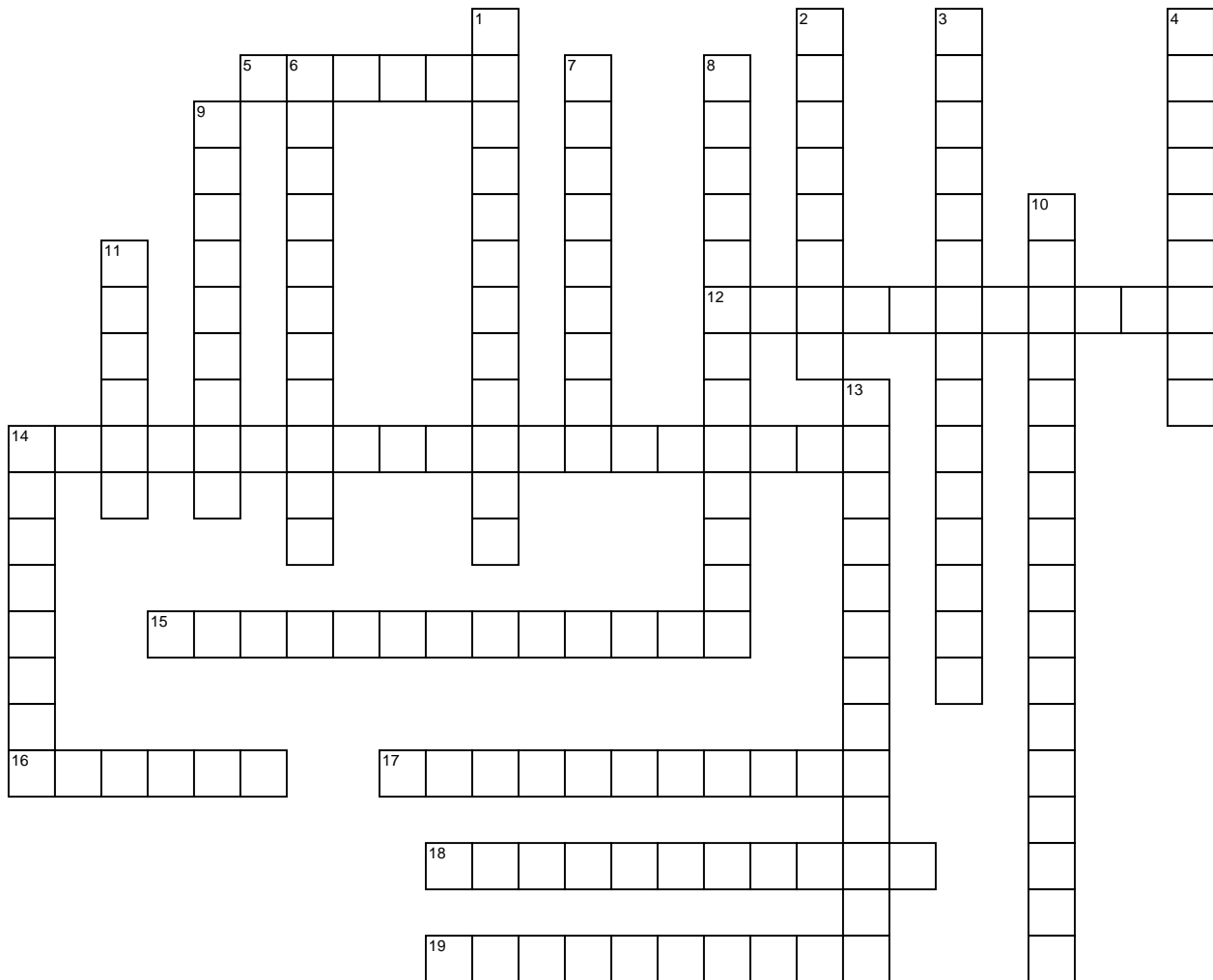
**LINKS/EXTENSION:** Students will use the skills and techniques they learned from this project to expand the local GeoCache sites that were established by the previous Environmental Science class. Students will also set up a “Treasure Hunt” for elementary students which will involve collecting waypoints of locations where small items are hidden. Environmental Science students will then sponsor an Elementary GIS field day to introduce the younger students to the use of GPS receivers.

REFERENCES: Students will be referred to various tutorial materials in my possession to learn how the ArcView program can be used for spatial analysis, and also to produce three-dimensional computer models through the use of digital elevation data.

ATTACHMENT: Crossword puzzle of Archaeological terms.

# Early Peopling of the New World

NEH SUMMER INSTITUTE - 2012



www.CrosswordWeaver.com

## ACROSS

- 5 where did humans originate?
- 12 a well described site in Chile that MAY be pre-Clovis in age
- 14 People arrive in the new World from NE Asia by foot over Beringia
- 15 paleoindian stone spear points having a groove or "flute" on each face.
- 16 a spear thrower
- 17 when did people first arrive in North America
- 18 the last Ice Age
- 19 the location of large

mammal kills with bone and artifacts

## DOWN

- 1 the first people in North America
- 2 the recent period since the end of the Pleistocene
- 3 African American cowboy of he Crowfoot ranch who found the folsom site
- 4 An Upper Paleolithic culture in France that some feel is the point of origin for Clovis points

- 6 Kill site of Bison antiques with folsom points found by G. McJunkin
- 7 The site in Washington state along the Columbia River where a 9,200 year old skeleton with "Caucasiod" characteristics was found
- 8 Fluted paleoindian points sometimes found with bison kills
- 9 Large Pleistocene (Ice Age) animals now extinct, including mammoths and

- mastodons
- 10 the passage way between the Laurentide and Cordilleran glaciers at the end of the pleistocene .
- 11 Native American Graves Protection and Repatriation Act of 1990
- 13 fluted paleoindian points sometimes found with mammoth and mastodon kills
- 14 exposed Pleistocene era land bridge between NE Asia and America

**WORD BANK:** 13500yrsago, africa, atlatl, beringia, beringia-walk-model, clovis-points, fluted-points, folsom-points, folsom-site, george-mcjunkin, holocene, ice-free-corridor, kennewick, kill-sites, megafauna, monte-verde, nagpra, paleoindians, pleistocene, solutrean.

# Early Peopling of the New World

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Solution:

