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This lesson was created by a teacher participating in the Eisenhower Professional Development Project/Elementary and Secondary Education Act Title II grant entitled *Using Archaeology as an Integrated Gateway to Teacher Professional Development*.

Title: Spear Point Production

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Since the primary need for all cultures is security, my lesson centered on the need for food. One of the goals of our curriculum in fifth grade is to meet Wisconsin standard B8.8. Students are asked to, "Identify major scientific discoveries and technological innovations and describe their social and economic effects on society." Creating a model of a spear with tag board and a straw seemed like a great way to meet this standard. Initially, I gave the students very little guidance. I wanted to tap into their critical thinking skills and help them discover the best ways to create a spear. With this approach, students had to think more like the prehistoric people they were studying.

I was very pleased with the results of this lesson. Everything went according to the lesson plan. Students began to share and trade among themselves for better materials. They also soon realized that they needed a way to keep their points on the spear. This led to the discovery of glue, tape, and string. In the group discussions many students made insightful comments. One student mentioned that these people would have to know about aerodynamics and balance in order get the spear to fly straight. Another student inferred that these people would have to know a lot about their surroundings and the material available. When asked to give more details, this student mentioned that certain sticks and stones would work better than others for making a spear. In discussing basic needs, the students came to the conclusion that meeting the need for food must have taken so much time that very little was left to devote to the other needs. These comments of course led to some great discussions and provided possible research topics for the future.

The design of the students' spears also stimulated good discussions. One student put his point on the end of a straw and then fit it into a longer, larger straw. He used this design because it made the spear fly better, but it also led to a great discussion on the use of darts and the atlatl. A couple

of students put paper “wings” on the back of the spear to help them fly straighter. This helped lead to the discussion on aerodynamics and flight. Most of the class cut a notch in the straw and slid the point between the slits. This was very logical and simulated the way prehistoric people attached their points. I was also pleased to see that a couple of students used their straw as a socket and fit the point into the straw. We were able to discuss the copper culture and creation of spear points with sockets.

The images found at google.com were a wonderful resource. Since I have a projector in my classroom, I was able to show students examples of points and hafting methods of real projectile points. The students were excited to see similarities between these and the models they had created. One element that I added to my lesson was the assignment of an acrostic poem. Since the processing of this lesson was done as a group, I wanted a way to evaluate what each individual learned. This is an element I will have to implement next year.

Grade Level:	4-8
Subjects:	Science, social studies
Objectives:	<ol style="list-style-type: none"><li>1. That prehistoric people had to have a good knowledge of the physical world around them in order to choose the best material for spear production</li><li>2. That prehistoric people were intelligent beings who experimented with the materials around them in an attempt to raise their level of technology and make their lives easier and more productive.</li></ol>
WI Standards:	History B8.8 Science C.8.4
Duration:	45 minutes
Materials:	<ul style="list-style-type: none"><li>-Soda straws in a variety of lengths and quality</li><li>-Paper/tag board in a variety of thicknesses</li><li>-Scotch tape, glue, yarn</li><li>-Scissors (one per student)</li></ul>
Vocabulary:	-Projectile Point - A worked piece of stone used as the tip of an arrow or spear.
Background:	All prehistoric people in Wisconsin used some type of projectile point for hunting and/or protection. The Paleo and Archaic cultures attached these projectile points to the end of spears. During the Woodland period the bow and arrow came into existence. The Oneota also utilized this technology. Attaching the stone point onto a wooden shaft is known as hafting.

Hafting was often accomplished by sliding the stone point between the split ends of the wooden shaft. In addition, the point was secured by use of some type of cordage and/or adhesive. The Achilles tendon of deer made excellent cordage, and pine pitch was used as adhesive. Oftentimes the points were notched near the base to aid in the hafting process. Certain rock materials like flints and cherts were prized and sought after for their fracture properties. These rocks allowed the toolmaker greater control in the outcome of the point. As a result, archaeologists have discovered that prehistoric people had extensive trade networks. One example of this can be found at Silver Mound near Hixton, Wisconsin. Orthoquartzite, sandstone that was hardened by silica, was mined by prehistoric people and used in tool production. Samples of these tools can be found in different areas throughout the United States.

- Setting the Stage: Students will be asked to pretend that they are prehistoric people who must make a spear for hunting. They will be provided with a straw (wooden shaft) and paper (rock).
- Procedure:
1. Distribute straws and paper to each student. Give different students throughout the room materials of higher quality. The purpose of this is to observe if they choose to trade or share the better materials.
  2. Instruct students to create a spear that will hit its target from ten feet away. They create a point from the paper and attach it to the shaft or straw.
  3. Choose a location in the room to be the testing ground. A bulls eye can be attached to the wall and a line drawn ten feet away.
  4. Keep the glue, yarn, and tape hidden. Wait until a student asks to use one of these materials. After one student has asked to use a certain item, limit the number of subsequent students who use the same item to six or seven. This will force the rest of the class to think of other ways to attach their points.
- Closure: After all students have had time to create and test a spear, hold a class discussion to share the results. Discuss strategies and observations students made. Record inferences students make about these tools or the prehistoric people who used them. Tie in the idea of trading and sharing of better materials. Also make links between the glue, tape, and string we used to the materials prehistoric people would have used. At this point the background information from above may be shared with the class.
- Evaluation: Challenge students to share content they have learned or inferences they have made in an acrostic poem. Assign students to use the word projectile for their poems.
- Links: Science: The fracture properties of stone were important to early toolmakers. In addition to flints and cherts, have students research other

types of rocks that were used for making projectile points. Were these rocks sedimentary, igneous, or metamorphic? How were these rocks formed? What made them good choices for tool production?

Social Studies: What areas near Eau Claire provided prehistoric people with the kind of rock material they sought? How was this material formed? Was there evidence that this material was traded?

Extension: Writing: Ask students to write a fictional piece about hunting a mastodon or mammoth. Remind them to include information and inferences the class made during today's lesson.

References: Google.com has many images of arrowheads and projectile points that give students a good visual idea of the actual points created by prehistoric people. Typing the word hafting brings up pictures of actual point hafted onto a spear shaft. These images serve as a good follow-up to the lesson.