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Petrified Forest National Park

Environmental Education Program

Petrified Forest, AZ (928)524-6228

**Prehistoric Technology**

**Archeology; Grades 7-12**

**Lesson Topic:**

How Technological Advances Impact Society

**Lesson Theme (Main Idea):**

Important inventions have been made and continue to be made that greatly impact human cultural development. The students will discuss why these new innovations were important to ancient people and compare their inventions with modern ones. This lesson also addresses issues concerning the impact of science and technology on society.

**Objectives:**

* Discuss inventions of the past and their importance
* Compare inventions of the past with some inventions of today
* Make a cause and effect chart
* Choose one item used be many people in the present and write a narrative on what archeologists in the future will know about us by finding this artifact.
* Students will write five mini-essays

**Standards Addressed:**

English Language Literature in History & Social Studies

Common Core 9-10.RH.7

Common Core 9-10.WHST.4

Common Core 6-12.CCR.1-4

**Learning Strategies:**

* Students will engage in discussion and cooperative learning/writing activities
* Students will reflect and complete five writing activities.

**Key Vocabulary:**

Atlatl - a device for throwing a spear or dart that consists of a rod or board with a projection (as a hook) at the rear end to hold the weapon in place until released.

Technology - the application of scientific knowledge for practical purposes

Invention - a device or process created out of study and experiment.

Mass production – the production of large amounts of standardized (identical) products; often using an assembly line

Necessity – something that is needed for survival

Luxury - a condition of abundance or great ease and comfort

Ingenuity - the quality of being clever, original, and inventive.

Lever - a rigid bar resting on a pivot, used to help move a heavy or firmly fixed load with one end when pressure is applied to the other

**Materials:**

Handouts, post-it-notes, piece of Velcro, colored pencils or crayons, drawing paper, pencil, writing paper, bags of odds & ends (miscellaneous items from the closet such as paper clips, erasers, nuts and bolts, crayons, tape, etc.) for student groups

***The Lesson***

**Motivation:**

The teacher puts students into small groups and gives each group one of the bags containing miscellaneous items. Students are asked to invent and ‘build’ something from the items. The teacher guides and asks questions, such as, “What benefit to society will your invention have? How easy or difficult would it be to mass produce your invention? Is your invention a necessity or luxury?”

**Presentation:**

There are four mini-writing activities:

Writing #1: Discuss the atlatl and the bow and arrow and their impact on the lives of people. Complete the writing prompts using complete sentences.

Writing #2: Pass out the cause and effect chart and have students fill it in as the class discusses the ways inventions have affected peoples’ lives.

Writing #3: Read the “History of Three Inventions” with the students. Have students try to guess what invention you are describing. After the guesses, show examples of Velcro, etc. Write a summary paragraph of this article with a topic sentence, at least three supporting sentences, and one clincher sentence.

Writing #4: Students work as individuals or small groups and select an item many people use today such as an automobile, microwave, or a computer. Have students write what archeologists of the future will know about us by finding this item. Your goal is write at least 125 words on this topic.

**Practice and Application:**

Students will consider and discuss questions relevant to the lesson theme and objectives. When working on the writing activities, they will have opportunity to practice and apply these themes, and to reflect on how they might impact their own lives.

**Review and Assessment:**

The teacher may use the writing activities for review and formal assessment.

**Writing #1:** Read the article below and then discuss the atlatl and the bow and arrow and their impact on the lives of people. Complete the writing prompts which follow.

Hunting in prehistoric times required special skills, knowledge of the land and its animals, and the creativity to plan and carry out the hunt. With weapons and tools made with little more than sticks and stones, prehistoric hunters could stalk and slay almost any animal on land. They also could spear, trap, hook, or net a variety of creatures in rivers and oceans. When we think of prehistoric hunters, the first weapon that comes to mind may be the bow and arrow. Archeologists, however, believe that American Indian hunters began using the bow and arrow relatively recently, that is, around *1200 years* ago in most parts of the Southwest, including at Puerco Pueblo in Petrified Forest National Park.

While 1200 years ago may seem like a very long time, consider that there have been people living on the North American continent for at least 13,500 years! So, if prehistoric hunters were not using the bow and arrow, what types of weapons and strategies did they use during that enormous stretch of time?

In addition to hand-thrown spears, one of the oldest known hunting devices was a short stick with a funny-sounding name. The atlatl (pronounced at-lát-till, or á-till-lattil) is a spear-thrower, a stick about two feet or so in length made of wood. It functioned as a lever that gave the hunter's more throwing power and distance.

A small prong or hook at one end of the stick held a lightweight throwing spear or dart in place on the atlatl until it was released by a powerful overhead swing of the arm. Hurled to its target, the dart—tipped with a chipped-stone point—would penetrate the animal, wounding or killing it.

The darts were often made in two parts: a long main shaft made of hollow cane, and a short foreshaft made of hardwood. A flint dart point (often called a spear point or, mistakenly, an arrowhead) was tightly fastened to the "business" end of the foreshaft. The other end of the foreshaft fit snugly into the end of the hollow main shaft. It is possible that if the atlatl was in use long ago in what today is the Petrified Forest, the stone points were made out petrified wood.

Although simple in design, the atlatl was a very effective weapon. Because it extends the length of the human arm by about 18 inches, it allowed a hunter to throw a dart much farther-the length of a football field-than he could without it and with the force necessary to bring down large game. When Spanish soldiers entered what today is Mexico, they encountered Aztec warriors with atlatls (the name comes from the Aztec's language). The soldiers soon learned the hard way that darts hurled from atlatls could penetrate their metal armor!

The atlatl is a very ancient weapon—no one really knows how old, but it was in use in the Old World at least 20,000 years ago. It is likely that the earliest people to enter the New World were equipped with it.

The atlatl was a throwing device developed by Paleo-Indian people to improve the power of a spear or dart used to hunt large animals. It was used successfully for thousands of years, continuing during the Archaic period.

The bow and arrow was developed during the Late Prehistoric Period and continued in use through the Historic period. Advantages of the bow and arrow over the atlatl and spear include the fact that a hunter with a bow and arrow can shoot an animal from much farther away, thus increasing safety. The arrow uses a smaller projectile point and can be aimed more accurately. By the historic period, American Indians had perfected the art of hunting with a bow and arrow, including from horseback, sometimes at great speed.

*Complete the following writing prompts using complete sentences.*

1. Ancient hunters must have had a great deal of ingenuity and skill because…
2. The Spaniards learned to respect the seemingly primitive atlatl when…
3. The bow and arrow has a number of advantages over the atlatl, including…
4. Where the dart point attached to the foreshaft is called the ‘business’ end because…
5. The atlatl is an example of a simple machine called a lever because…

**Writing #2**: Complete the cause and effect chart and discuss the ways these inventions affected people’s lives.

**Cause** **Effect**

Atlatl enabled hunters to throw the spear farther

Bow & Arrow

Fire Starter

Mano & Metate

Pottery

Automobile

Microwave Oven

Cell Phone

Others

*Writing #2 – write five cause & effect sentences based on the chart*

For example: Early people began using the atlatl *because* it enabled hunters to throw the spear farther.

**Extension:**

Students may draw their rendition how a current object will be used, such as the telephone or computer of the future.

**History of Three Inventions**

*The teacher reads “History of Three Inventions.” Students do not have a copy, and so must listen carefully. Have students try to guess what invention you are describing. After the guesses, show examples of Velcro, etc. Then, have students write a summary paragraph with a topic sentence, at least three supporting sentences, and one clincher sentence.*

**Post-It-Notes**

Art Fry was an employee of the 3-M Co. He always marked his choir book at church with scraps of paper. Often these pieces of paper would drop out and he would have to remark the page. In 1974, Mr. Fry remembered a fellow employee, by the name of Dr. Spencer Silver, had discovered and discarded an adhesive because it was not strong enough to be permanently useful. Mr. Fry began working on this adhesive. For one and a half years he worked to make an adhesive that would be strong enough to hold a note in place, but not too strong that it would be permanently attached. In 1977 the 3-M Co. test marketed the post-it-note in four cities. It was successful in only two of the cities. When they researched to find why, they discovered that the two successful cities had given free samples. After trying the post-it-note for free, people liked it so much they were then buying packages of them.

**Telephone**

In 1876 an inventor spilled battery acid on his pants and called for his assistant to please come help him. The assistant heard the plea for help through the device they were working on.

Alexander Graham Bell and his assistant, Thomas Watson, were working on the telephone. Bell called out, “Watson, please come here. I want you.” This accident helped them to realize their success, and the invention was patented a few months later.

**Velcro**

An inventor went for a walk and noticed upon returning that he had cockleburs stuck to his clothes. He wondered what enabled them to stick so tightly to clothes. He looked at one under a microscope and noticed it was covered with small hooks similar to fishhooks. This gave him the idea to develop Velcro.

Write a summary paragraph of the article the teacher just read to you, with a topic sentence, at least three supporting sentences, and one clincher sentence.

**Writing #4**

Students work as individuals or small groups and select an item many people use today such as an automobile, microwave, computer, or a cell phone. You might also have students take an object out of their backpack or desk. Have students write what archeologists of the future will know about them/us by finding this item. Your goal is to write at least 125 words on this topic.