

Petrified Forest National Park

Environmental Education Program

Petrified Forest, AZ (928)524-6228

**Prehistoric Sustenance**

**Archeology; Grades 7-12**

**Lesson Topic:**

How did the inhabitants of Puerco Pueblo find enough food to survive?

**Lesson Theme (Main Idea):**

The Puerco Pueblo People demonstrated ingenuity and persistence in providing enough food to provide for the needs of an established, permanent settlement

**Objectives:**

* Develop an appreciation for the human tenacity for obtaining food
* Develop an understanding and appreciation for the importance of cooperative effort in solving problems
* Reflect on how similar traits can assist people living today
* Develop an understanding that different foods provide varying nutritional values
* Develop an appreciation for eating the foods that provide enough caloric intake to keep yourself healthy

**Standards Addressed:**

English Language Literature and History/Social Studies: Common Core 9-10.RH.7

Science: Strand 1, Concepts 1 & 3

**Learning Strategies:**

* Students will be presented background material in a scripted, question-and-answer format to prepare them for a student-driven learning activity
* Students will engage in a cooperative learning activity designed to meet the objectives cited above

**Key Vocabulary:**

**Calorie** - a unit of heat used to indicate the amount of energy that foods will produce in the human body.

**Cooperation** - the process of working together towards the same goal.

**Nomadic –** anything that involves moving around a lot; (for a human) moving across the land using several temporary homes according to locations of food sources

**Domesticated –** (for a plant) a wild plant that has been adapted for human use; (for an animal) one that is tame and kept as a pet or on a farm.

**Cultivated** - land that is prepared and used for raising crops

**Resource** - a source of food, or available means of living

**Materials:** Kernel or can of corn, dry beans, meat bones, other food items Handout #1 (2 pages), Handout #2 (3 pages)

***The Lesson***

**Motivation:**

The teacher begins this class by showing the students as kernel of corn, several dry beans, and perhaps a meat bone meant to represent deer or antelope. Ask the students, “How many kernels or cans of corn do you think it would take to keep me alive for a week? a month? a year? Could I just eat only corn all the time and still stay healthy, etc.? Go through the same procedure with the beans, the meat, and other items the teacher would like to bring in.

Now, let’s think about how much corn or beans or venison you would need to feed 20 people, 100 people, or even 200 people. How much would you need for a day, a week, a month, or a year?

What if there were no grocery stores around? You have to do all your own gathering and hunting, and not just for yourself, but you need to work cooperatively. What if you live in an environment where finding food is not easily done? What percentage of your day would you be willing to spend finding enough food to stay alive? How important would getting food be to you?

**Transitional Statement:**

In this lesson we are going to examine ways in which the inhabitants of Puerco Pueblo found answers to these challenges.

**Presentation:**

Part One: Overview – Puerco Pueblo background knowledge. The teacher passes out copies of Handout #1 and guides students through the material.

Part Two: Survival Chart – Finding enough food & surviving at Puerco Pueblo. The teacher passes out copies of Handout #2, previewing and explaining how the activity will work.

**Practice and Application:**

Students will consider and discuss questions relevant to the lesson theme and objectives in Part One. During Part Two, 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 questions provided in the Handouts #1 and #2 for review and formal assessment.

**Handout #1: Overview of Puerco Pueblo**

Close to 500 CE the people living in an around what is now Petrified Forest National Park were starting to change the way they obtained resources. They slowly stopped relying on the nomadic ways of a traditional hunting and gathering lifestyle and began living in temporary homes across the landscape. Their movements were often aligned with the movement of game animals and the ripening of wild plants. They began living in small communities and started cultivating the land for agriculture. Over time, they acquired more possessions, stored food, made pottery, adopted the bow and arrow, and domesticated dogs and turkeys. They still hunted and gathered as a complement to the corn, beans, squash and other crops that they grew. By the time Puerco Pueblo was built, close to 1000 years ago, the people of the area were skilled farmers and cooperated with each other for their survival.

*Q: How did the lifestyle of early southwest people begin to change?*

 *Find at least five in the paragraph above.*

The heart of the ancestral Puebloan region lay across the southern Colorado Plateau and the upper Rio Grande drainage. It spanned northeastern Arizona, northwestern New Mexico, southeastern Utah and southwestern Colorado—a land of forested mountain ranges, stream-dissected mesas, arid grasslands, and occasional river bottoms. During the times that Puerco Pueblo was occupied, large game, including mountain sheep, elk, mule deer, and black bear occupied the mountainous areas to the south in the White Mountains. Pronghorn grazed the grasslands around the pueblo just as they do today. Migratory water birds would appear at mountain ponds and flatland playa lakes during the fall.

*Q: What possible food sources are mentioned in the paragraph above?*

The growing season surrounding Puerco Pueblo – the arid grasslands and river bottoms – lasts seven months or longer. Annual precipitation ranges from 8 to 12 inches, most of it falling in late summer and early autumn. Midwinter temperatures range from 23 to 47 degrees Fahrenheit, and midsummer temperatures, from 64 to 91 degrees Fahrenheit. As we see from the analyses of tree rings, which serve as a year-by-year indicator of rainfall, precipitation often equaled or exceeded modern averages. There may have been a series of years in which more rainfall would result in more wild plant growth, resulting in more game down the food chain. More rain would have meant better yield for cultivated crops. Just as often, however, there were drier periods lasting several years or even decades.

*Q: Compare growing seasons in the park area today with what confronted*

 *the Puerco Pueblo residents. Do they appear to be somewhat similar or vastly*

 *different?*

The early ancestral Puebloans clothed themselves in fur- or turkey-feather robes, string aprons, loincloths and round-toed, plant-fiber sandals. They wore ornaments made of shell, bone or stone. They likely raised their crops – at this time, primarily corn and squash – in garden-like plots rather than in large fields. Apparently unaware of the bow and arrow, the men hunted the larger game animals with the spear, which they hurled with the throwing device we call the "atlatl." Women gathered wild food plants such as amaranth, piñon nuts, Indian rice grass, sunflower seeds and tansy mustard seeds, and they used coarse stone basins to grind domesticated and wild seeds into flour.

As the years passed, the people became more distinctly agriculturists, adding beans to their suite of food crops, thereby significantly improving the nutritional value of the products of their fields. They appear to have domesticated the turkey, which joined previously-tamed dogs in the village compound. They adopted the bow and arrow for the hunt, gradually giving up the lance and atlatl. They developed more efficient grinding basins for processing grains. They also began to make and use pottery for containers and cooking vessels. The people of Puerco Pueblo continued to hunt and gather to supplement their crops, which they knew were always subject to failure in an arid land with unpredictable rainfall.

*Q: What was gathered and what was hunted for food?*

 *What new crop added nutritional value to their diet?*

 *Why would hunting and gathering have to remain an important source of food?*
 *What would a Puerco Pueblo resident’s typical meal look like?*

 *How healthy do you think this diet would have been?*

 *How much of your time do you think would have been spent growing, procuring,*

 *and preparing food?*

In the second part of our lesson, you are going to go back in time, imagining that you are in charge of a group of Puerco Pueblo residents, figuring out how to provide enough food to keep everyone alive and healthy. The food items you will be working with were resources available to the ancestral Puebloans who used to live in Petrified Forest National Park.

Make sure you have a copy of *Handout #2: Puerco Survival Chart* (3 pages).

**Handout #2: Puerco Survival Chart**

You control a group of twenty hunter-gatherers. You are living on the land, making use of the natural resources found there. This is a semi-arid region receiving low annual rainfall (averaging around 10-15 inches a year) with short-grass and scrub vegetation so food items are scarce. You are able to go on hunting expeditions, but remember the closest mountainous areas containing larger and more abundant game are 70 miles or more away, and you travel everywhere on foot.

Fill in the chart for each month, showing the types of foods you are going to harvest at that time, and how many calories you can get from those foods. Remember that your group can store food for the next season only if you are staying put at Puerco.

Optional: Give your group a name. Give your men, women, and children names.

Your Group: 20 people

 7 adult men need… 3,000 calories/person/day

 7 adult women need… 2,400 calories/person/day

 6 children need… 2,000 calories/person/day

 Your group needs… 49,800 calories/day total

**Food Resources:**

Big Game: Mule deer, Pronghorn, Bighorn Sheep

Available locally and within seven days walk round-trip

Available year-round, but best hunting in fall and early winter

You average one big game animal taken every three days

*Yield = 40,000 calories/animal*

Small Game: Rabbits & Birds

 Available locally – no extensive travel required

 Available year-round, but best hunting in spring and early summer

 You average two small game animals taken every day

 *Yield = 3000 calories/animal*

Corn

Available locally, only from September through October

*Yield = 200,000 calories/harvest day – total harvest lasts 20 days*

Beans & Squash

Available locally, only from October through November

*Yield = 300,000 calories/harvest day – total harvest lasts 20 days*

Wild Plants:Indian rice grass, tansy mustard, prickly pear, goosefoot, amaranth, etc. Available locally, only from June through September *Yield = 20,000 calories/day for 4 months*

Puerco Pueblo Survival Chart

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| January | February | March | April | May | June |
| Foods to Harvest | Foods to Harvest | Foods to Harvest | Foods to Harvest | Foods to Harvest | Foods to Harvest |
| Calories Gained | Calories Gained | Calories Gained | Calories Gained | Calories Gained | Calories Gained |
|  |  |  |  |  |  |
| July  | August | September | October | November | December |
| Foods to Harvest | Foods to Harvest | Foods to Harvest | Foods to Harvest | Foods to Harvest | Foods to Harvest |
| Calories Gained | Calories Gained | Calories Gained | Calories Gained | Calories Gained | Calories Gained |

Survival Chart Questions

1. Which resources are the best for feeding your whole band of people with minimum effort?
2. Which resources are the most important for helping your band live through the winter?

3) Were you able to feed everybody and keep them all alive for one year?

 If not, what adjustments do you need to make?

4) What if food storage were not possible? Could you still survive? How?

5) What would happen if any one of these food sources were severely depleted or unavailable for a year?

*For example:*

How would your Survival Chart be affected if a plague struck the big game population and your kill rate was cut in half?

What if the beans and squash got some disease and produced next to nothing?

What might be another scenario that could jeopardize the group’s survival?