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CURRICULUM AND LESSON PLANS

LESSON 6: THE ARCHAEOLOGY OF WEST POINT

SUBJECTS
Social Studies, History, Archaeology
DURATION
30 minutes (+)
CLASS SIZE
10 to 30 students

OVERVIEW

This lesson examines the methods and techniques archaeologists used to investigate the site including testing isolated units, excavating block units, and analyzing the site. Students will also learn about how archaeologists determined the chronology of the site based on absolute and relative dating methods.

OBJECTIVES

- To learn about methods archaeologists used to investigate West Point
- To examine the techniques archaeologists used to analyze West Point
- To understand the chronology of West Point
- To study some of the findings expressed by the archaeologists

MATERIALS

Archaeologist's Tools; photocopies of "Tools of an Archaeologist" to distribute to students; laminated graphic "Step 1 … Step 6"; overhead projector; overhead transparencies "Investigating the West Point Site: Step 1 to Step 6" or photocopies of each Step for each student; photocopies of "Chronology Of The West Point Site" to distribute to students; laminated information sheet "Location Of An Artifact; and books *Archaeologists Dig for Clues, Stone, Bone, Antler and Shell*, and *Young Oxford Book of Archaeology.*

VOCABULARY

Absolute dating – measuring time by assigning calendar dates to artifacts and other archaeological remains.
Archaeological material – remains found in archaeological sites such as artifacts, plant and animal remains, and features.
Artifact – an object made or used by people.

Chronology - the determination of dates and the sequence of events in the order that they occurred.
Context – the location in which an artifact is found and the other artifacts or features that were found near that artifact.
Cultural deposits – evidence of human activity found in the ground such as artifacts, and plant and animal remains.
Excavate – to systematically remove layers of dirt from a site.
Feature - material remains that cannot be removed from an archaeological site in one piece such as a fire hearth, rock oven, or shell midden.
Matrix (pl. matrices) – the groundmass that surrounds and contains archaeological material such as artifacts, plant and animal remains, and features.
Radiocarbon dating – a scientific method to find out how old material is by measuring the amount of carbon-14 atoms that it contains. The result of a radiocarbon test is an age in years before present (B.P.).
Relative dating – determining whether something such as an artifact, stratum or site is older or younger than something else without knowing its age in years.
Screening – the process of sifting matrix through a mesh wire in order to separate archaeological material from the matrix.
Stratigraphy – the layers of dirt deposited over time and revealed by excavation.
Stratum (pl. strata) – a layer of dirt of varying depth and horizontal span that can be identified by archaeologists by characteristics such as color, grain size, or proportion of shell or gravel.
Test unit – an isolated square unit that is excavated in order to determine the nature and distribution of cultural deposits throughout a site.

BACKGROUND

The West Point Site is located on the north side of Discovery Park in the Magnolia District of Seattle. Ordinarily, the location of an archaeological site is not disclosed to the public. However the situation at West Point is different for a number of reasons. First, the public knew about the archaeological investigations at West Point from reports by the media. Second, the current status of the site makes it less vulnerable to threats of vandalism or destruction because most of the site remains buried under the West Point Wastewater Treatment Plant. Third, all of the parties affected by the investigation including the archaeologists, King County, and Native American advisors have agreed that disclosing the general location of the site is acceptable in order to teach the public about the archaeology of West Point.

The first person to identify cultural deposits at West Point was geologist Brian Atwater. While studying soil deposits in a trench excavated for a new

pipeline, Atwater noticed a thick layer of crushed mussels. This layer of cultural deposits was located 14 feet below modern day sea level. Appropriate state and federal agencies were notified. Archaeologists examined the trench and devised a plan of action. They also recorded the stratigraphy of the trench and collected samples of the cultural deposits from the trench.

Investigating the West Point site required cooperation among many people including construction workers, county, state, and federal government officials, representatives of affected Native American tribes, geologists, and archaeologists. Construction workers assisted archaeologists in removing layers of fill that had been placed on top of the cultural deposits during the last hundred years of use of the site. Many government officials oversaw the investigations. Representatives from affected Native American tribes were involved in consultations regarding the investigations. Geologists worked to create maps that reconstructed what the environment of West Point looked like thousands of years ago. These maps helped archaeologists predict where cultural deposits might be located throughout the project area. A twenty-person crew of archaeologists worked investigating the site.

Archaeologists conducted test excavations to better understand the extent, nature, and integrity of the cultural deposits. The testing phase included excavating eleven 1 x 1 meter units scattered throughout the area near the pipeline trench (Remember: 1 meter equals 3.3 feet). Archaeologists used shovels and trowels to carefully excavate each unit. The material removed from the site was screened using mesh screens. Archaeologists sorted the material remaining in the screen looking for artifacts, fish and animal bones, and charcoal. They also completed a set of forms that recorded information about the test unit's stratigraphy and the artifacts found in that unit. During the testing phase, archaeologists studied the stratigraphy of the test units to better understand the different types of matrix found throughout the site. Archaeologists use the word matrix to describe the ground in an archaeological site that contains and surrounds archaeological material such as artifacts, plant and animal remains, and features. Three main types of cultural matrix were identified: matrix with thick layers of shell and a wide range of artifacts; matrix with thin layers of shell and some artifacts; and matrix with scattered artifacts and no shell. Artifacts found during the testing phase of the project provided evidence that West Point would qualify as an official archaeological site and be eligible for the National Register of Historic Places. The small bone bipoint in the kit was recovered from Test Unit 8.

Before proceeding further with the investigations, archaeologists developed questions that guided them in their research. These research questions concerned

three topics; the formation of the site, the chronology of the site, and the subsistence and settlement patterns of the people of West Point.

In order to find answers to their research questions, archaeologists needed to collect more information about the site. Archaeologists called this step of the project, the data recovery phase. The data recovery phase included excavating trenches, excavating block units, screening excavated material, sorting screened material, and bagging and labeling artifacts. First, a track-hoe was used to excavate twelve trenches throughout the project area. These trenches had a total length of 81 meters (almost 270 feet). Archaeologists studied the stratigraphy of these trenches. They also compared the stratigraphy of the trenches to the stratigraphy of the test units. Second, a data recovery method called isolated block excavation was used to conduct the excavations. Four isolated blocks of varying size were situated throughout the main project area. These blocks were called Block 1, Block 2, Block 3, and Block 4. Each block consisted of a varying number of 1 x 1 meter units. Block 1 included 32 units. Block 2 included 29 units. Block 3 included 13 units. Block 4 included 9 units. In all, a total of 83 1 x 1 meter units were excavated. This amounted to 12% of the total surface area of the main site at West Point. This education kit contains artifacts found in Blocks 1, 2 and 3, as well as a few artifacts recovered from other areas of the West Point Site that were less extensively investigated.

During the data recovery phase of the project archaeologists carefully excavated the block units. They used shovels and trowels to remove matrix one layer at a time. Archaeologists use the word stratum to describe a layer of earth with distinguishing characteristics such as color, grain size, or proportion of shell or gravel. The archaeologists recorded important information about the volume, vertical depth, and horizontal span of each stratum. They closely examined the characteristics of each stratum observing the similarities and differences between the strata.

Archaeologists screened the material excavated from the block units. They used water pressure in order to push the wet and highly compacted silt and clay matrix from each unit through screens. They used screens with holes of various sizes ranging in size from 1/8 inch to 1 inch. Lithic artifacts, mammal bones, fish bones, and charcoal found in the larger size screens were placed in plastic bags and sent to the laboratory for processing. Material from the smaller size screens was placed in plastic bags to be sorted and processed in the lab. Most of the artifacts found at West Point were made of materials such as stone, bone, antler, and shell. These materials are the most frequently found artifacts in the Pacific Northwest because they do not decompose as rapidly as artifacts made from wood or plants.

Soil samples were also collected for later examination in the lab. Archaeologists studied soil samples from the site to determine how the landform changed over time and how people adapted to these changes. Rock features such as hearths, pits, and ovens provided clues as to how the site was used. Botanical samples of plants were examined to better understand during which seasons people occupied the site.

Archaeologists also sought to understand how long people lived at West Point. In order to determine the chronology of the West Point Site, archaeologists used *absolute* and *relative dating* techniques. *Absolute dates* are verifiable by scientific tests. *Relative dates* are determined by comparison. One type of absolute dating technique used by the archaeologists investigating West Point was radiocarbon testing. Radiocarbon tests, also known as carbon-14 tests, define the rate of decay carbon in organic material such as charcoal, fish and mammal bone. This rate of decay is then used to determine an approximate age of the material being tested. The age of the material that has been radiocarbon tested is expressed using a date range years Before Present (B.P.). For example, radiocarbon tests determined that a sample of charcoal from a fire hearth at West Point was 4,181 to 3,687 B.P. A total of 68 samples from West Point were radiocarbon tested. These samples provided dates ranging from 4,250 to 200 B.P. Archaeologists used this date range to define several different periods of occupation at the West Point Site.

Archaeologists investigating West Point also used relative dating techniques to understand the chronology of the site. One type of relative dating employed was the analysis of the stratigraphy at the site. Always remember the Law of Superposition that says "The newest layer is on top and the oldest layer is on the bottom". Archaeologists compared the stratigraphy of the test units to the stratigraphy of the block units. Stratigraphic layers or *strata* that were the same were assumed to be from the same time period. Another type of relative dating employed was the comparison of materials found at West Point to materials found at other dated archaeological sites in the Pacific Northwest. For example, archaeologists compared the projectile points found at West Point to other projectile points found at other archaeological sites in the Pacific Northwest that date to a specific time period. Some of the projectile points found at West Point had characteristics very similar to the projectile points from other dated sites in the Pacific Northwest. It was then possible to correlate the projectile points found at West Point to the time periods associated with the projectile points from the other dated sites.

The chronology of West Point is divided into five components. The oldest component identified was Component 1 (4,250 to 3,550 B.P.). This period is

characterized by year-round habitation of the site and use of a wide range of resources. Component 2 (3,550 to 2,700 B.P) is distinguished by a shift to a more seasonal use of the site and a more focused use of resources. In Component 3 (2,700 to 2,350) the site was used primarily in summer, fall, and winter, and activities related to fishing and processing food were the most prominent. A gap in the archaeological data exists from 2,350 to 1,450 B.P. Archaeologists might have learned more about this period if more of the West Point area could have been investigated. During Component 4 (1,450 to 700 B.P.) an earthquake caused some major changes in the landform. The site significantly shrank in size. The people at West Point became more focused on fishing for salmon and drying clams. In the last period, Component 5 (700 to 200 B.P) West Point was used for fish processing and drying clams (see "Chronology of the West Point Site" for additional information about each component).

PROCEDURE

INVESTIGATING THE WEST POINT SITE

1. Begin by discussing some of the basic archaeological field techniques such as excavating square units with straight sidewalls, screening, and documenting the site. Refer to *The Young Oxford Book of Archaeology*, Chapter 1: Decoding the Evidence, for information about excavating, screening and processing information (Younger students in grades K-4 would benefit from the story *Archaeologists Dig for Clues* by Kate Duke).
2. Take out the tool bag containing the Tools of An Archaeologist. Distribute the tools among the students.
3. Referring to the descriptions of Tools of An Archaeologist, allow each student to explain how an archaeologist would use a particular tool to investigate a site.
4. Explain to the class that investigating the West Point Site took place in several steps. Display the laminated graphic, "Step 1 … Step 6", in front of the class. This graphic illustrates the six steps of investigating the West Point Site.
5. Begin to discuss how the investigation of the West Point Site progressed. To do this, use the laminated graphic "Step 1 … Step 6" and the six overhead transparencies "Investigating the West Point Site" or distribute photocopies to the students of the six illustrations, "Investigating the West Point Site".
6. Identify the six steps of the investigating the West Point Site.
7. Discuss "Step 1: Finding the Site" by explaining how geologist Brian Atwater found the first cultural deposits at the site in a trench being dug for a new pipeline.

8. Next, discuss "Step 2: Testing the Site" by explaining how archaeologists excavated eleven 1 x 1 meter test units throughout the site in order to better understand the extent and nature of the site, and where to conduct more in depth excavations.
9. Then, discuss "Step 3: Digging Trenches" by explaining how many of the trenches were dug as part of the modifications and construction of the Wastewater Treatment Plant. The archaeologists monitored these areas and conducted more in depth excavations adjacent to these areas.
10. Next, discuss "Step 4: Setting Up Blocks" by explaining how the main areas excavated consisted of four blocks located adjacent to the pre-existing trenches.
11. Discuss "Step 5: Excavating Units" by explaining how archaeologists carefully excavated the individual 1 x1 meter units, removing one stratum at time, screening the material removed from the units, recording data, and photographing the excavations. Remind students that excavation is a destructive process, therefore archaeologists place tremendous importance on doing everything possible to preserve the most detailed and accurate information about the site as they excavate. For example, while excavating, archaeologists recorded detailed data about each stratum, took exact measurements of the locations where artifacts were found *in situ*, and photographed the excavations.
12. Finally. examine "Step 6: Studying Artifacts Context". This illustration shows the exact excavation units where artifacts included in the kit were found. Ask the students to define context. Discuss the definition of context and how archaeologists carefully record information about where an artifact is found in order to analyze the site. Use the laminated information sheet, "Locate Your Artifact" to match the excavation units shown in the illustration to the artifacts found in each unit.

CHRONOLOGY EXERCISE

1. Ask the students to define chronology.
2. Discuss how archaeologists determined the chronology of the West Point Site by using absolute and relative dating techniques.
3. Explain the techniques archaeologists used to determine the chronology of the West Point Site such as radiocarbon tests and analysis of stratigraphy.
4. Review the information sheet "Chronology Of The West Point Site" and discuss the five time periods called Components identified by the archaeologists.
5. Ask the students to draw a timeline that shows the five components and the dates for each component.

EXTENSION ACTIVITIES

1. Set up a 1 x 1 meter unit in your classroom use the stakes and string from the archaeologist tool bag.
2. Create a mini-midden by mixing various combinations of soil, gravel, pebbles, sand, and shell and layering them in a jar.
3. Do a mock excavation of a trashcan or create a shoebox dig.
4. Contact the Office of Archaeology and Historic Preservation (OAHP) in Washington or the State Historic and Preservation Office (SHPO) in your state to learn about archaeology in your state.
5. Illustrate the Chronology of the West Point Site. Draw pictures illustrating the five Components, or study the chronology of other archaeological sites.

REFERENCES

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Larson, Lynn L. and Dennis E. Lewarch eds. The Archaeology of West Point. Seattle: Larson Anthropological/Archaeological Services, 1995.

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TOOLS OF AN ARCHAEOLOGIST

These are the archaeologist's tools that can be found in the kit. Archaeologists use these tools to investigate archaeological sites.

BROOM AND DUSTPAN - Used to brush and scoop up dirt from the area where the archeologist is working.

BRUSH - Used to carefully brush away dirt from an object in the ground.

CLIPBOARD WITH NOTEBOOK - It is important for archaeologists to write down exactly where they find an artifact. Because it is hard to take a desk outdoors, archaeologists use a clipboard and notebook to record important information.

COMPASS - Archaeologists often use a compass when they are looking for sites.

FLAGGING TAPE - Used to mark a location that the archaeologist wants to return to later such as the place where a feature is located.

GLOVES - Used to protect the hands while digging or sifting dirt through a screen.

LINE LEVEL - Archaeologists attach these to strings and use them to measure how far below the surface of the ground an artifact was found.

PLUMB BOB – Attached to a piece of string to ensure that the sidewalls of the excavation unit are straight or to aid in recording the precise location where artifacts are found in the unit.

STAKES – Used to mark the corners of each unit and anchor string around the unit.

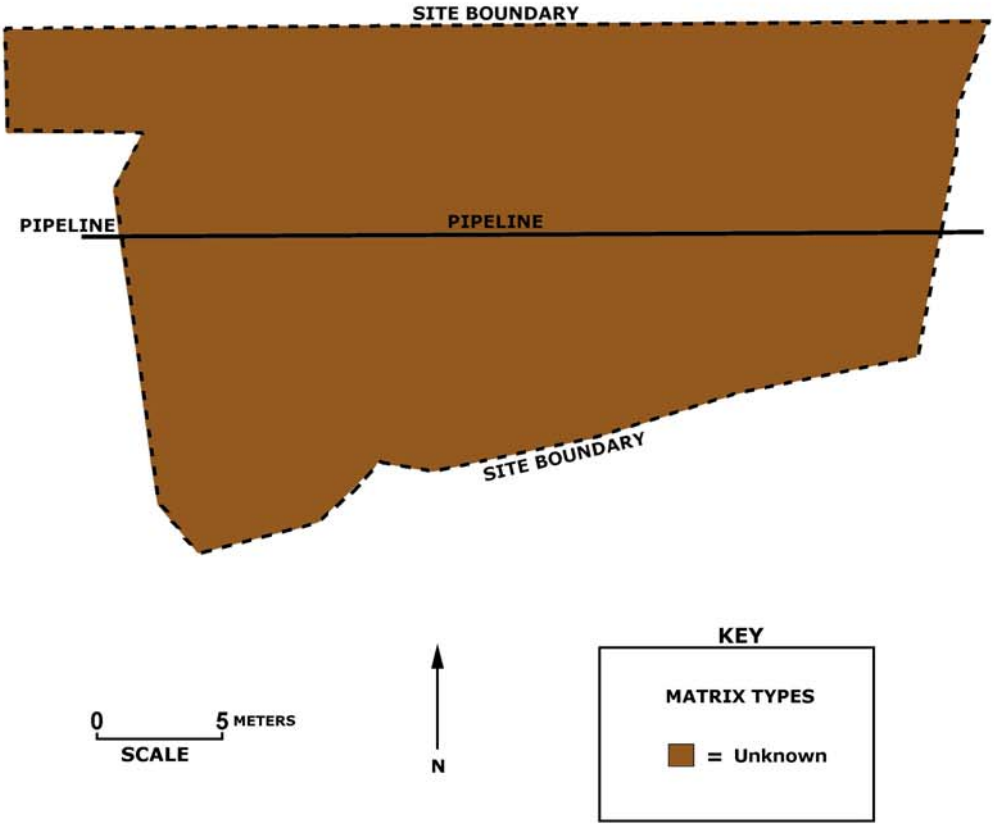
STRING - Used to delineate the unit so that the archaeologist can keep the walls of the unit she is digging straight. Also used to hold the line level up.

TAPE MEASURE - Used to measure the exact location of an artifact.

TROWEL - A tool with a triangular or square blade used to carefully scrape away layers of dirt in a site.

STEP 1

FINDING THE SITE

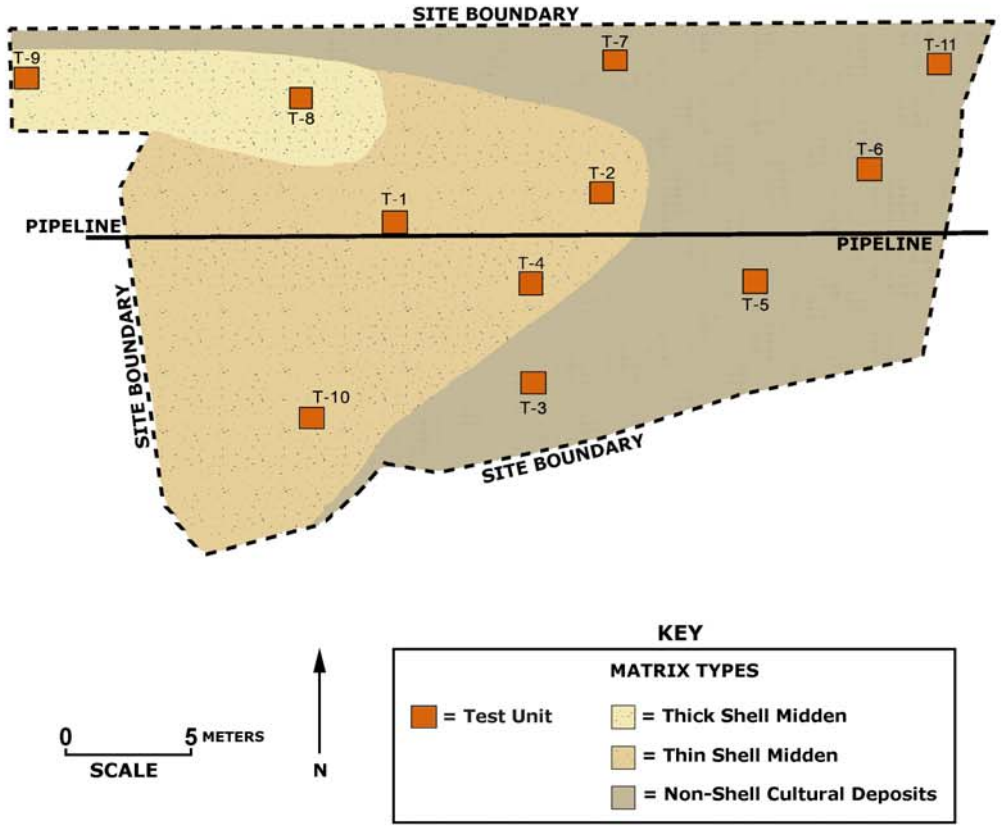


EXPLANATION:

This illustration shows the pipeline where geologist Brian Atwater identified the first cultural deposits found at West Point.

STEP 2

TESTING THE SITE

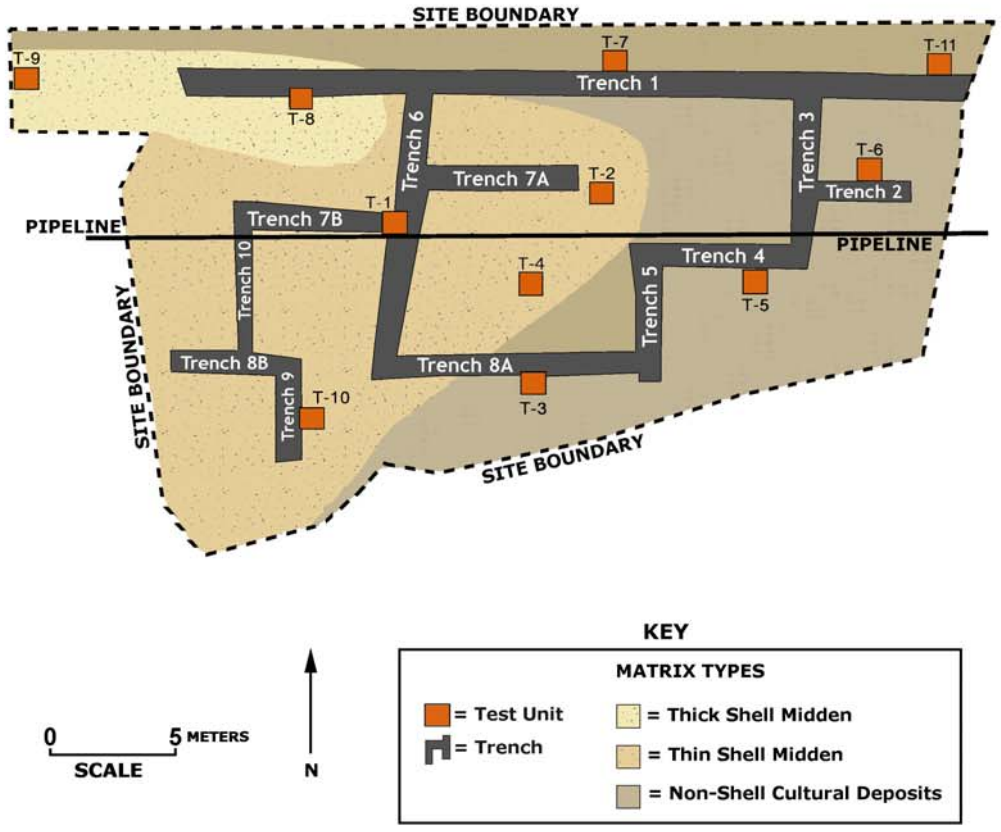


EXPLANATION:

This illustration shows the 1x1 meter units that archaeologists excavated during the testing phase of the project.

STEP 3

DIGGING TRENCHES

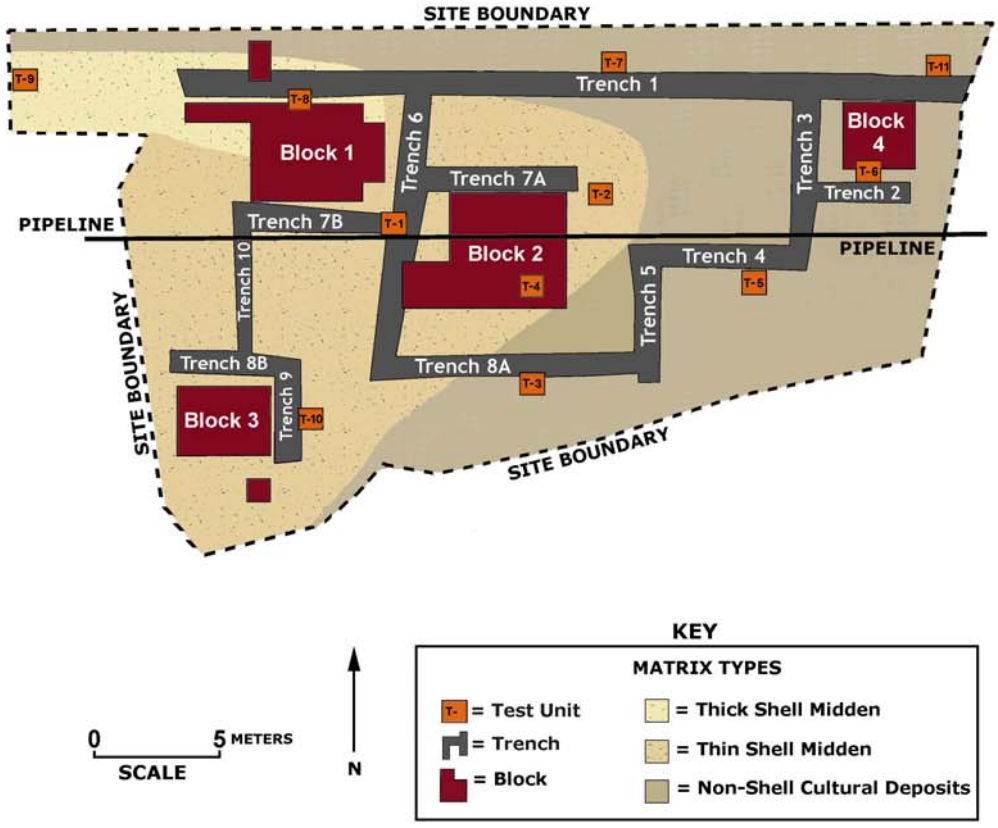


EXPLANATION:

This illustration shows the trenches excavated throughout the site.

STEP 4

SETTING UP BLOCKS

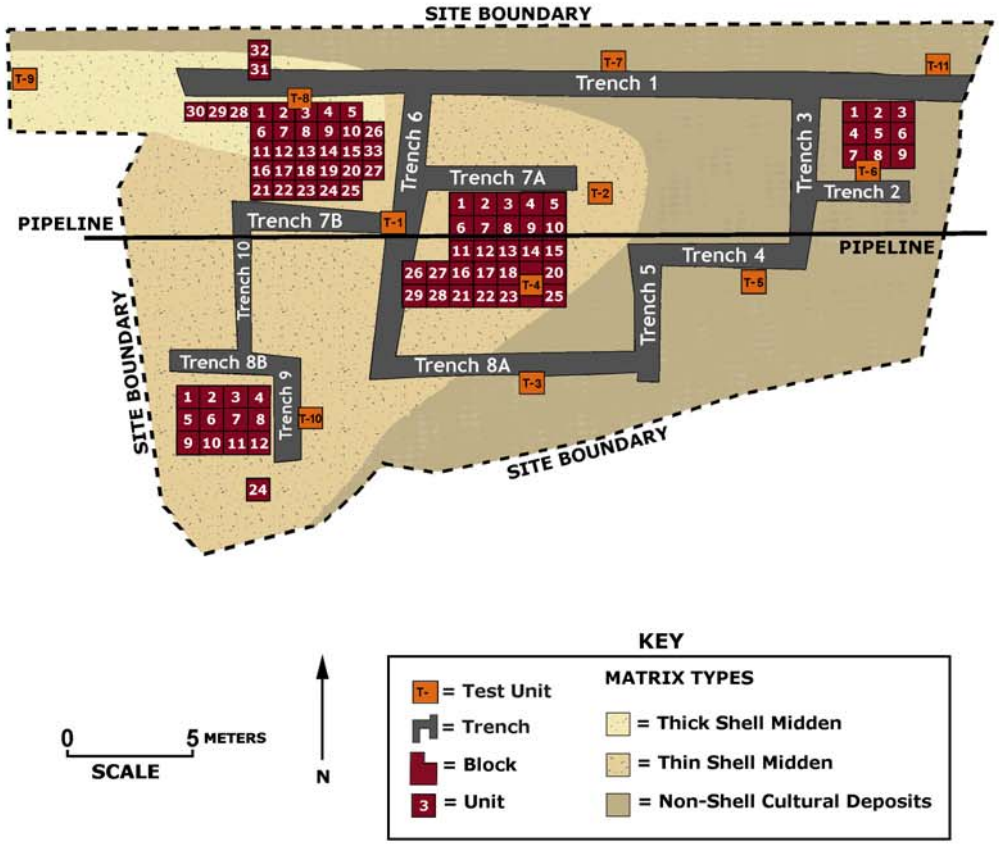


EXPLANATION:

This illustration shows where archaeologists set up the main areas to excavate. These main areas are called BLOCKS.

STEP 5

EXCAVATING UNITS

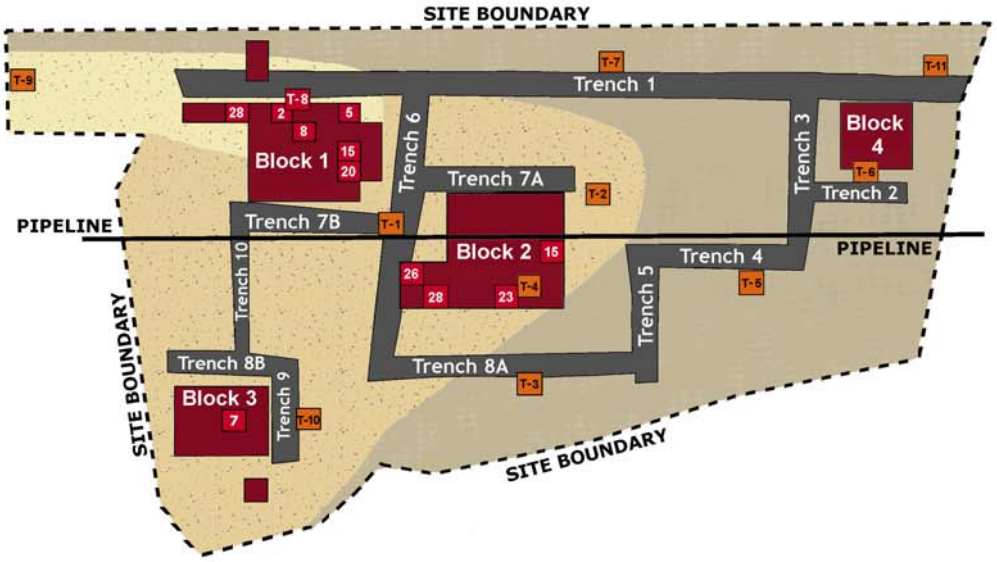


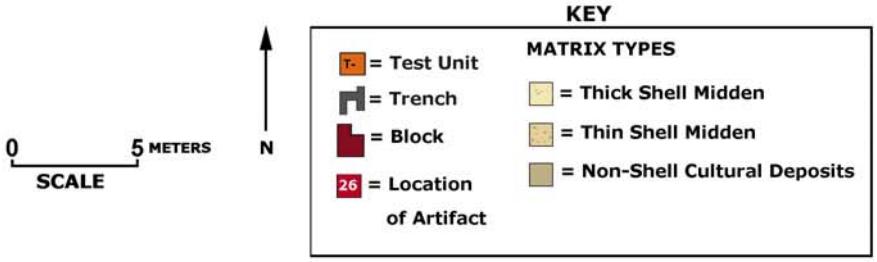
EXPLANATION:

This illustration shows the individual 1x1 meter units that archaeologists excavated in each block.

STEP 6

STUDYING ARTIFACT CONTEXT



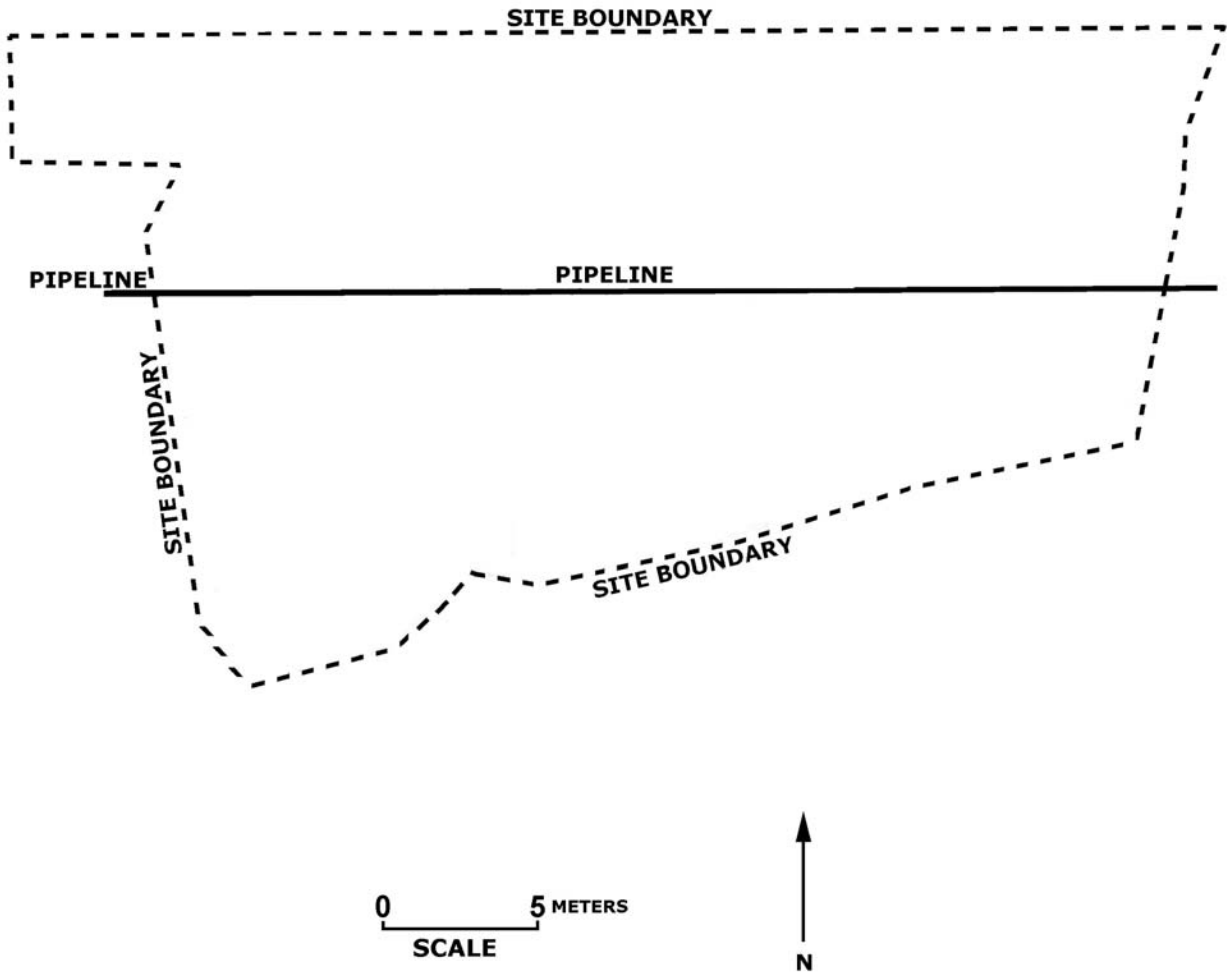


EXPLANATION:

This illustration shows the units where artifacts included in the kit were found.

INVESTIGATING THE WEST POINT SITE

STEP 1: FINDING THE SITE

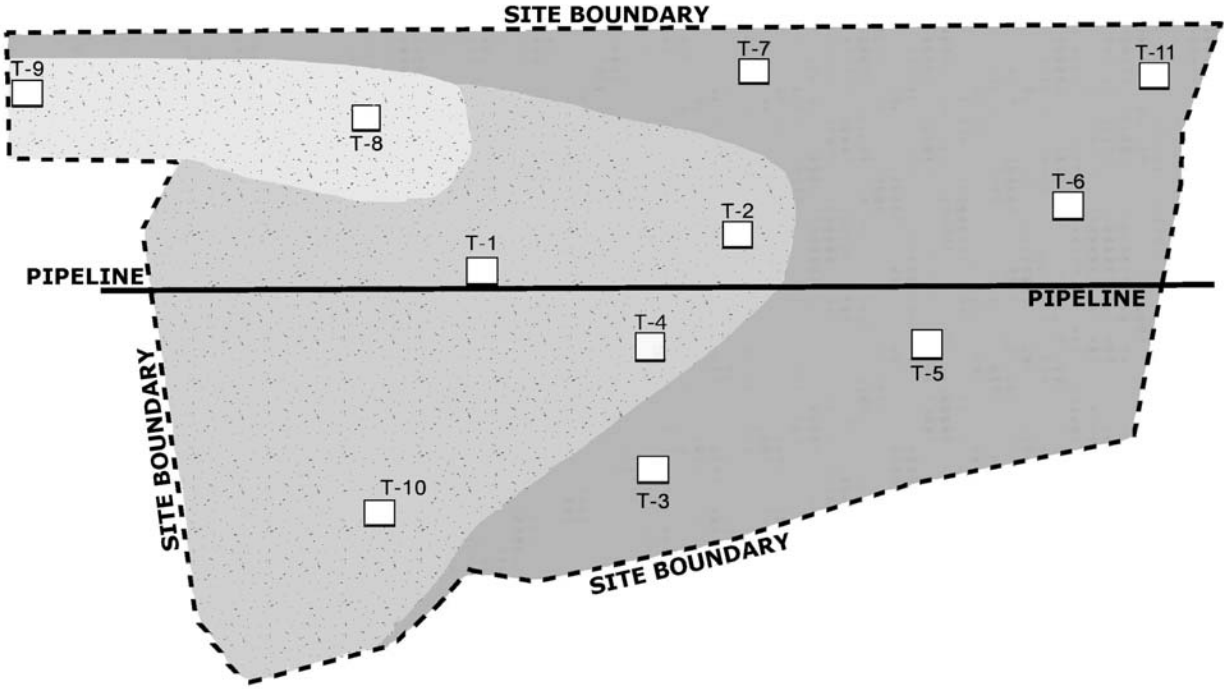


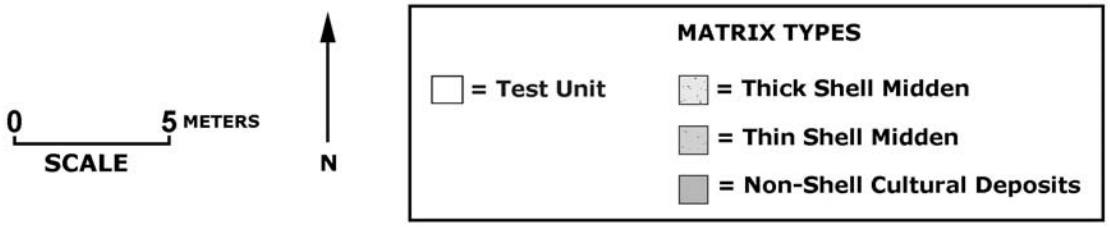
EXPLANATION:

This illustration shows the pipeline where geologists Brian Atwater identified the first cultural deposits found at West Point.

INVESTIGATING THE WEST POINT SITE

STEP 2: TESTING THE SITE



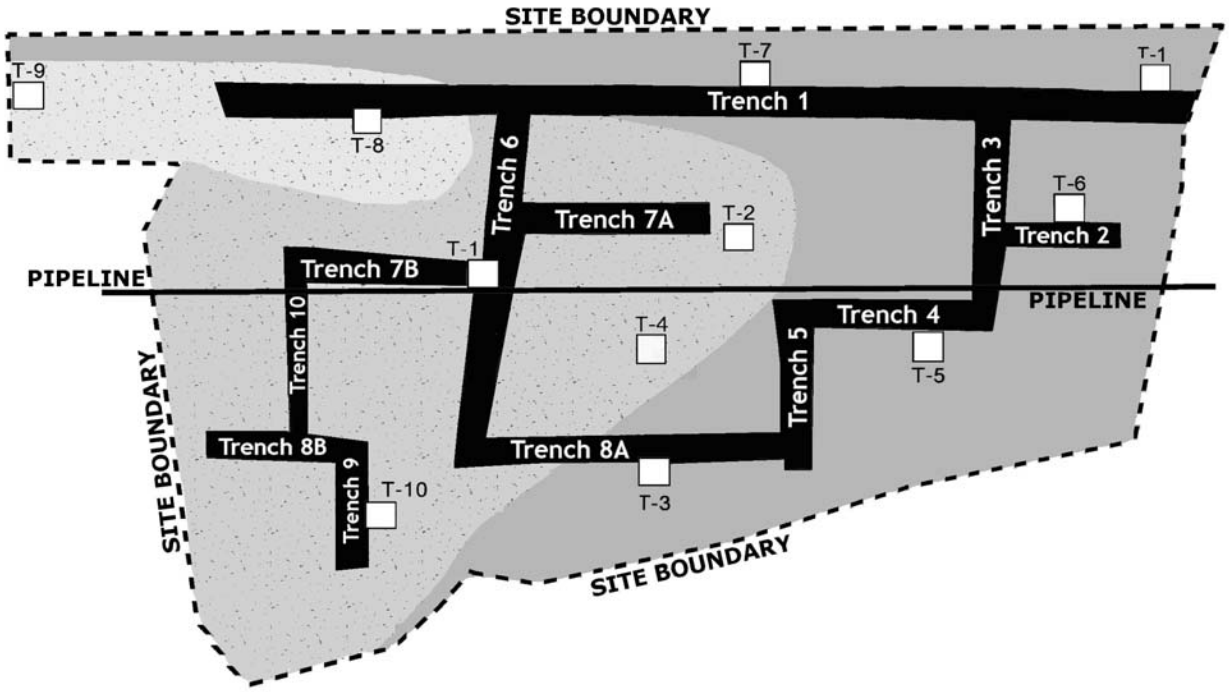


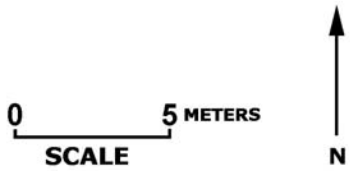
EXPLANATION:

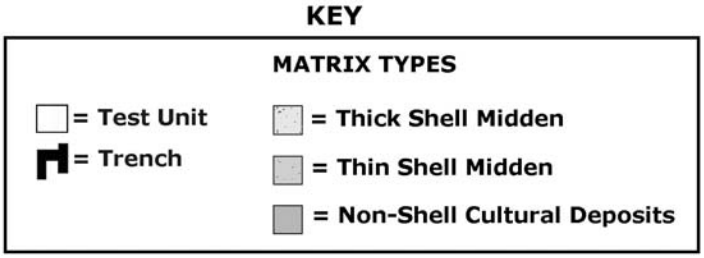
This illustration shows the 1x1 meter units that archaeologists excavated during the testing phase of the project.

INVESTIGATING THE WEST POINT SITE

STEP 3: DIGGING TRENCHES



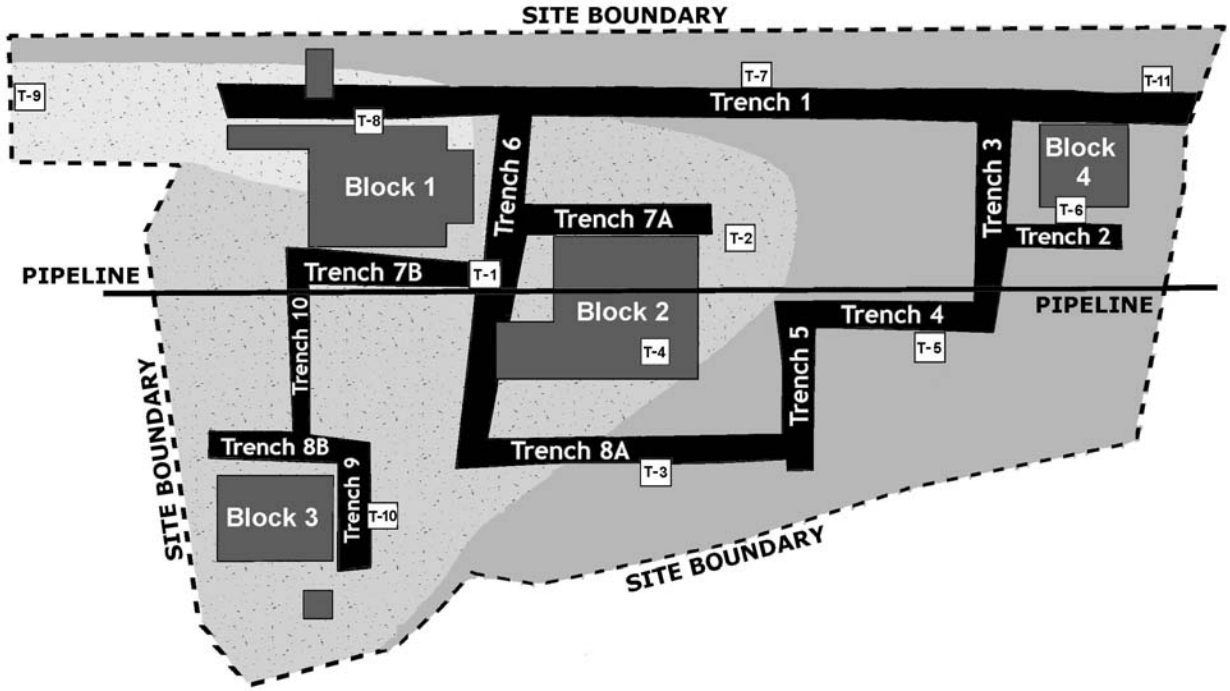


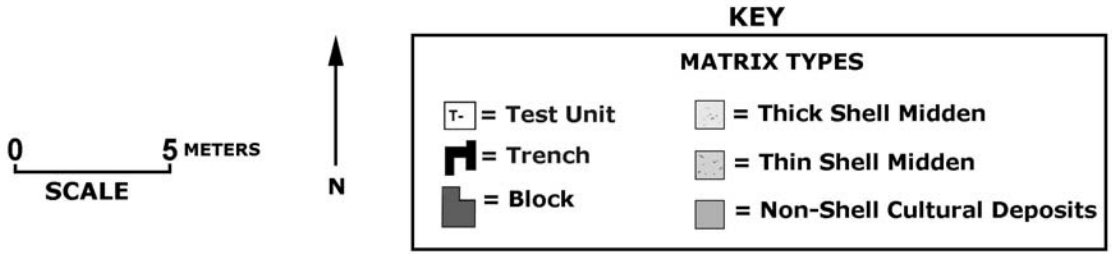


EXPLANATION:
This illustration shows the trenches excavated throughout the site.

INVESTIGATING THE WEST POINT SITE

STEP 4: SETTING UP BLOCKS



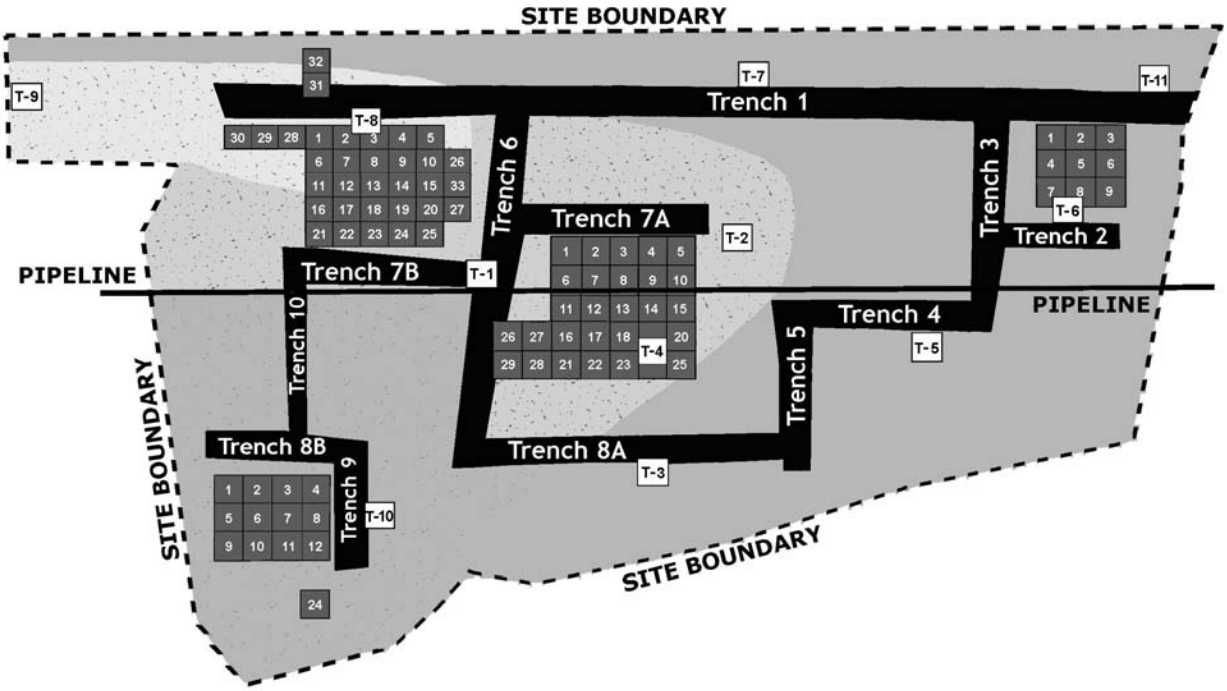


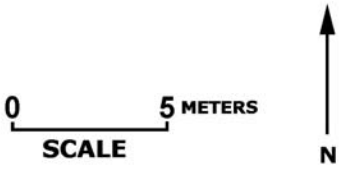
EXPLANATION:

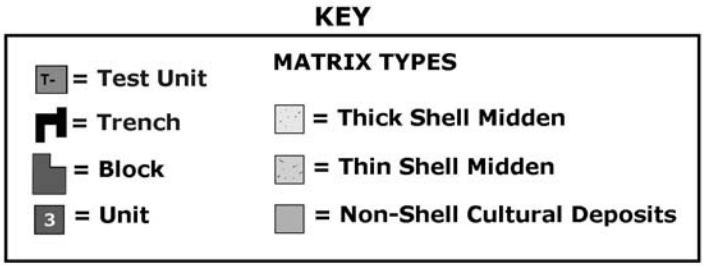
This illustration shows where archaeologists set up the main areas to excavate. These main areas are called BLOCKS.

INVESTIGATING THE WEST POINT SITE

STEP 5: EXCAVATING UNITS



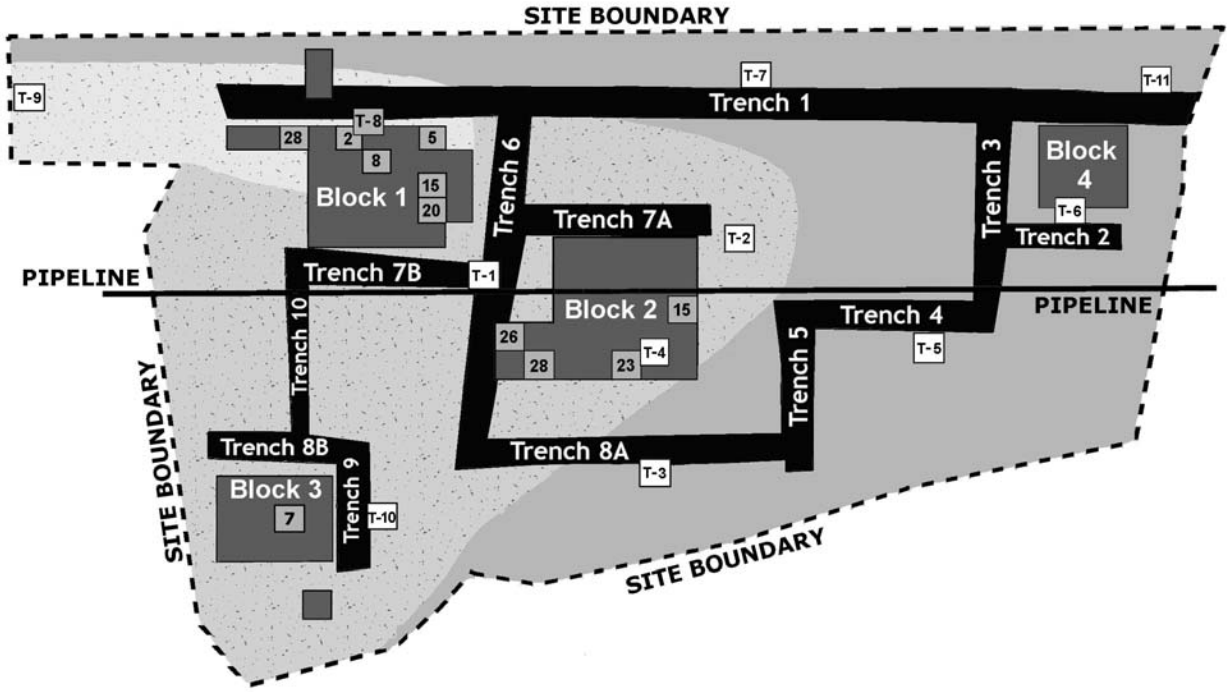


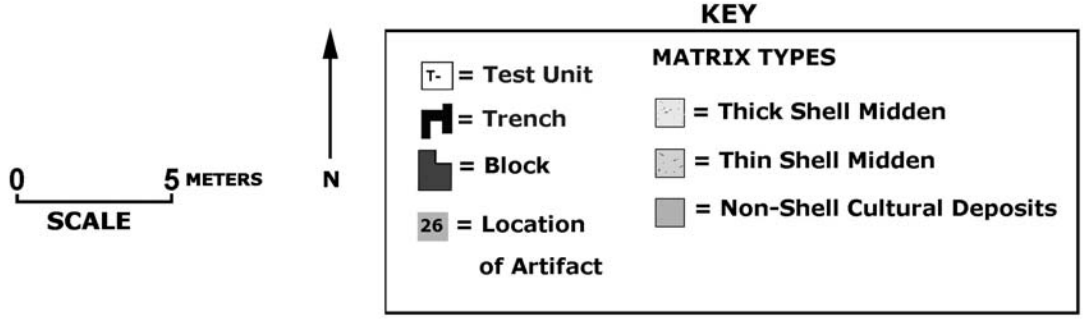


EXPLANATION:
This illustration shows the individual 1x1 meter units that archaeologists excavated in each block.

INVESTIGATING THE WEST POINT SITE

STEP 6: STUDYING ARTIFACT CONTEXT





EXPLANATION:
This illustration shows the units where artifacts included in the kit were found.

CHRONOLOGY OF THE WEST POINT SITE

Archaeologists studied the stratigraphy of the site and conducted radiocarbon tests of more than 60 samples of archaeological deposits in order to determine the chronology of the site. The chronology of the site was divided into five Components described below:

Component 1 (4,250-3,550 B.P.)

Use of the site year-round but most intensely during winter, spring, and summer. The people at West Point used the area for campsites, fishing, harvesting shellfish, and hunting for a wide variety of fish, shellfish, and animals. Fish and shellfish processed for immediate consumption. Evidence of possible trade with groups as far north as British Columbia.

Component 2 (3,550-2,700 B.P.)

Use of site year-round continued but intensity changed to spring, summer, and fall. Hunting, fishing, and gathering continued but the campsites and processing areas shifted, partially due to landslides. Emphasis on clams, salmon, and smaller mammals. Processing of salmon for immediate consumption and drying of clams for winter storage. Probably traded with groups to the south for petrified wood from the Columbia River drainage and obsidian from central and southern Oregon.

Component 3 (2700-2350 B.P.)

Significant change in use of site. Areas used for campsites and food processing continued to shift as a result of continuing landslide activity, rising sea levels, and expanding lagoon. Seasonal use of the site primarily in summer, fall, and winter for fishing, hunting, and gathering. Emphasis on fishing salmon and harvesting clams.

Unknown Gap (2350-1450 B.P.)

Gap in archaeological record. Use area might have been located in areas now underneath existing treatment plant buildings.

Component 4 (1450 - 700 B.P.)

Around 1000 B.P. an earthquake along the Seattle Fault caused the land available for use to decrease. Seasonal use of the site primarily in spring, summer, and fall. Intense fishing of salmon, and harvesting of clams and barnacles. Processing of salmon for immediate consumption and drying clams for winter storage.

Component 5 (700 -200 B.P.)

Use of site during spring and summer. Emphasis on fishing for salmon. Intense harvesting of clams, and cockles. Salmon processing and clam drying continued.