

Los Alamos County, New Mexico, WWII Heritage City

A series of lessons from the [World War II Heritage Cities Lesson Collection](#)



Figure 1: 1943 Los Alamos Project Main Gate (Credit: Los Alamos National Laboratory)

Introduction

All three lessons, and the culminating lesson, support the development of understanding the significance of Los Alamos County, New Mexico as an [American World War II Heritage City](#): its impacts to home front efforts with its contributions to The Manhattan Project (Los Alamos County), and the many civilians and service members who contributed to the work. The lessons highlight specific contributions but connect to larger themes and understandings of the U.S. home front during wartime.

Lessons (with World War II home front topics):

The first three lessons listed can be taught individually or collectively, in any order. The final lesson is to support students in combining learning across the three lessons, and/or comparison to other World War II home front cities in a culminating activity.

1. The Development of the Manhattan Project in Los Alamos County (p. 5)

- The Manhattan Project at Los Alamos
- Displacement of persons of Hispanic and Pueblo ancestry
- Special Engineering Detachment (SEDs)
- Home front city development
- General Leslie Groves
- Dr. J. R. Oppenheimer

2. Historical Perspectives on the Atomic Bomb created at Los Alamos (p. 19)

- The Manhattan Project at Los Alamos
- Dr. J. R. Oppenheimer
- The Trinity Site and test
- Japanese perspective from Hiroshima
- Post-war impacts of The Manhattan Project

3. Native American Home Front Contributions in Los Alamos County, New Mexico (p. 32)

- Native American history
- Pueblo art and culture
- Women's history
- Women in STEM
- The Manhattan Project

4. [Los Alamos County, New Mexico: Comparing and Connecting World War II Home Fronts \(p. 49\)](#)

Positioning these Lessons in the Curriculum:

The standards listed beneath the lesson links are a collection of standards covered in the lesson collection. Objectives for each lesson, materials, and resources are listed within the lesson.

Time period: World War II

Topics: World War II, women's history, workforce migration, science and technology

United States History Standards for Grades 5-12

This lesson relates to the following [National Standards for History](#) from the UCLA National Center for History in the Schools:

Era 8: The Great Depression and World War II (1929-1945)

Standard 3: The causes and course of World War II, the character of the war at home and abroad, and its reshaping of the U.S. role in world affairs

Curriculum Standards for Social Studies

This lesson relates to the following [Curriculum Standards themes for Social Studies](#) from the National Council for the Social Studies:

- Theme 2: Time, Continuity, and Change
- Theme 5: Individuals, Groups, and Institutions
- Theme 8: Science, Technology, and Society
- Theme 9: Global Connections

Relevant Common Core Standards

These lessons relate to the following [Common Core English and Language Arts Standards for History and Social Studies](#) for middle and high school students:

Key Ideas and Details

- CCSS.ELA-LITERACY.RH. 6-12.1
- CCSS.ELA-LITERACY.RH. 6-12.2

Craft and Structure

- CCSS.ELA-LITERACY.RH.6-12.4

Integration of Knowledge and Ideas

- CCSS.ELA-LITERACY.RH.6-12.7
- CCSS.ELA-LITERACY.RH.6-12.9

Range of Reading and Level of Text Complexity

- CCSS.ELA-LITERACY.RH.6-12.10

The lesson series was written by Sarah Nestor Lane, an educator and consultant funded by a National Council on Public History's cooperative agreement with the National Park Service.

Lesson 1: The Development of the Manhattan Project in Los Alamos County, New Mexico, WWII Heritage City

About this Lesson

This lesson is part of a series teaching about the World War II home front, with [Los Alamos County, New Mexico](#) designated as an American [World War II Heritage City](#). The lesson contains photographs, a background reading, and interview and memoir excerpts to contribute to learners' understandings about the home front contributions of Los Alamos and the people who lived there. It explores the history of the land and its people, along with sharing perspectives from a child who grew up there and a soldier stationed there. Extension activities include examining a local trail's markers and learning about African Americans and their contributions to the Manhattan Project.

Objectives:

1. Describe the history of the Los Alamos County Land and its people, prior to, and during, the Manhattan Project era.
2. Explain and reflect on the impact of the selection of Los Alamos County on the people living there.
3. Identify those who were recruited or asked to move to Los Alamos County, and their reasons for doing so, along with describing examples of their experiences.

Materials for Students:

1. Photos: Figures 2-7 (*can be displayed digitally*)
2. Readings 1, 2, 3
3. *Recommended:* [Los Alamos Map by Manhattan Project National Historical Park](#) and [Technical Areas Map](#) by Los Alamos Neutron Science Center
4. *Extensions:* 1) Kwage Mesa Trail Wayside Markers, 2) African Americans and the Manhattan Project

Getting Started: Essential Question

How did Los Alamos County, NM develop as a home front city, and what was the impact on those who lived or moved there?

Photos

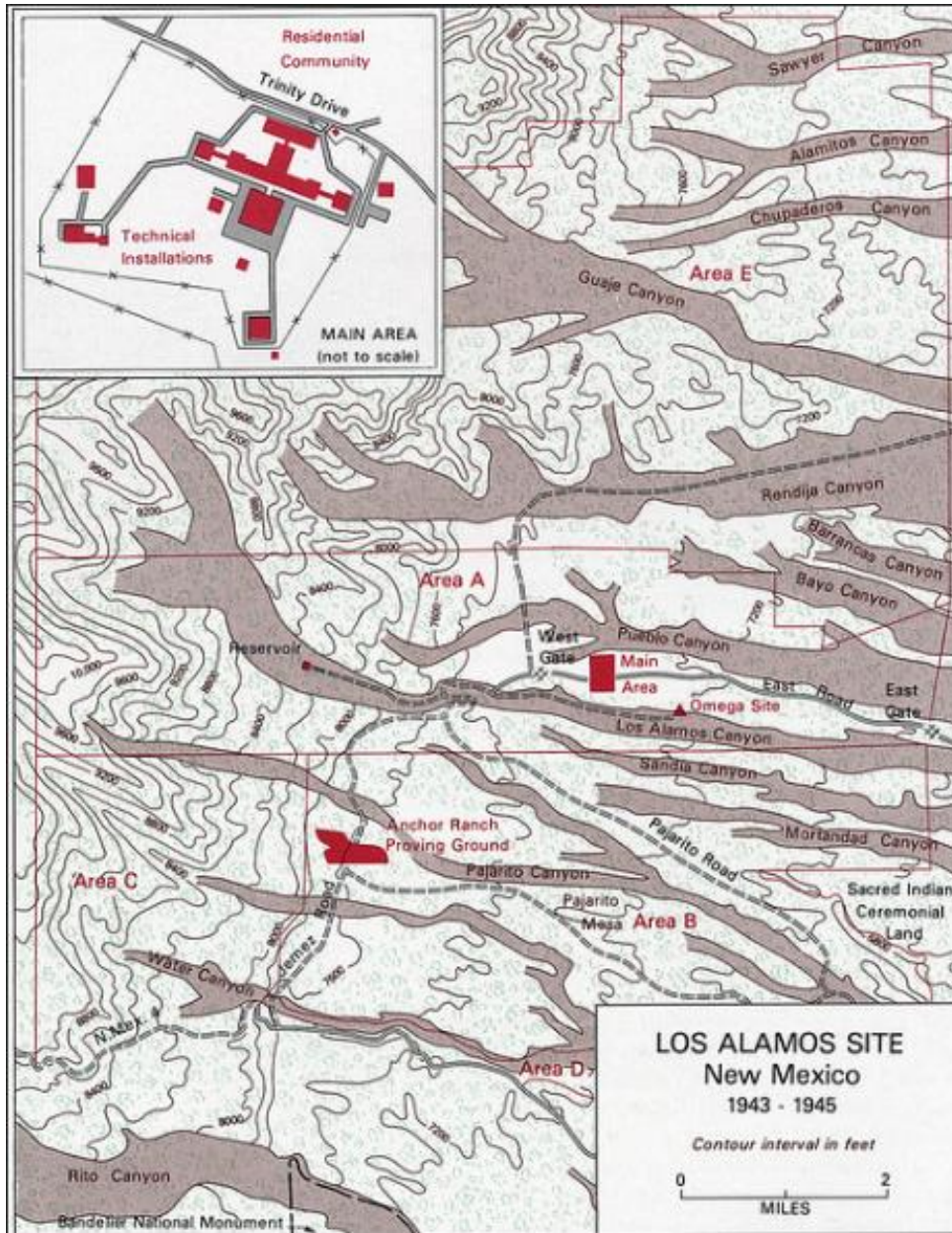


Figure 2: Los Alamos site map, 1943 – 1945. Note the labeling of “Sacred Indian Ceremonial Land” in bottom right corner. (Credit: Los Alamos National Laboratory, Department of Energy)



Figure 3: "TR-221," Image from a Los Alamos technical site (Credit: Los Alamos National Laboratory, Department of Energy)



Figure 4: Aerial view, 1950 (Credit: Los Alamos National Laboratory, Department of Energy)



By the numbers:

- 8,900 acres of privately-owned land and 45,100 acres of federally owned land (Forest Service) requested for “the establishment of a demolition range” from the Secretary of War to the Secretary of Agriculture on March 22, 1943
- The federal government purchased the land area for the Los Alamos Manhattan Project site for about \$415,000. Construction was completed in November of 1943 at a final cost of \$7 million.
- Los Alamos in 1943: Approximately 100 scientists, engineers, and support staff lived and worked there.
- Los Alamos in 1945: 6,000 people lived there, with more than 4,000 of them working in the laboratories.



Quotation to consider:

“It is certainly with pride, and a deep feeling of gratitude to each one of you, that I send this message. The security measures that still involve the Manhattan District Project, the great responsibility that each one of you will always have, set you apart as very special and honored heroines in World War II. Your devotion to duty, the sacrifices you have made, the daily soldier privileges that you have forfeited, and your loyalty to the security measures necessary will be proudly recorded in the history of the Women’s Army Corps.”

- Westray Battle Boyce, Director, Women’s Army Corps, letter to the WACs, dated September 6, 1945.



Read to Connect

Teacher Tip: Reading 1 can be used as the foundation for understanding the land and its background. To shorten the lesson, students can be divided into groups to read either Reading 2 or Reading 3, and then share a summary of the findings and perspectives from the interview and memoir.

Reading 1: Los Alamos County

By Sarah Nestor Lane

Los Alamos County, New Mexico is a Manhattan Project site. This project developed the atomic bomb in World War II. The history and development of the area is complex.

The History of the Land and its People

Los Alamos is on the Pajarito Plateau in the Jemez Mountains and is an [Ancestral Pueblo Site](#). Native people settled and lived in this area for thousands of years, dating back to around 12,000 years ago. Pueblo built villages between 150 and 1600 CE (common era) on the plateau. After the mid-1500s, people stopped living there year-round. They began building pueblos along the Rio Grande. In 1680, the Pueblo people rebelled against the colonizing Spanish. Some sought refuge on the plateau's ancestral sites. These places offered natural protection. Pueblo people carved [cavates](#), dwellings in tuff cliffs for shelter. Different groups, including the Pueblo, Athabaskan, and Hispanic people, continued using the plateau. They used it for hunting, gathering, and grazing during the late 19th and early 20th centuries. This was before and after New Mexico became a state in 1912.

World War II: Construction and Development

During World War II, the US government took over the land in this area to develop it as a site for the Manhattan Project. The Manhattan Project was created to develop the atomic bomb. The government's development of Los Alamos for the research laboratory led to the forced displacement of people from the land. This included Pueblo people and Anglo and [Hispanic homesteaders](#).

[General Leslie Groves](#) appointed [J. Robert Oppenheimer](#), a physicist, in the spring of 1942 to work on the Manhattan Project. He was familiar with the Los Alamos area, having a ranch nearby. The isolated area was easier to keep secure and was fortress-like. Government knowledge and reports from the area led to the final selection of Los Alamos for the Manhattan Project site.

At Los Alamos was the Los Alamos Ranch school, a boys only school, founded during World War I in 1918. [Ashley Pond Jr.](#) established the school. The school had strict discipline and rigorous academics. General Leslie Groves took over the school grounds by using the War Powers Act. This resulted in the closure of the school in January 1943. General Groves directed the construction at Los Alamos. Construction started after the federal government acquired the land. School facilities shifted to be bachelor quarters, a recreation room, library, nursery school, and a fire station. The [icehouse](#) was later used as a building to assemble the world's first nuclear device. Military and laboratory buildings built included an administration building, utilities, and technical buildings.

Scientist and Worker Recruitment

Oppenheimer recruited scientists to work at the laboratory in Los Alamos. General Groves contracted the University of California for the laboratory. The contract with University of California helped with recruitment and procurement of resources. It contributed by hosting

a laboratory, produced scientists and administrators, and also contracted with the US Army to administer civilian, non-scientific roles. Oppenheimer was one of the staff members of this university. Additionally, Special Engineer Department troops began arriving in October 1943. A total of 1800 worked at Los Alamos by August 1945.

Recruited scientists and university staff worked at the labs constructed at Los Alamos to develop nuclear bombs. However, African American scientists did not work at Los Alamos. African American scientists conducted research on nuclear reactions at the [Chicago Met Lab](#) and Columbia University. They provided findings to Manhattan Project scientists at other sites, like the Los Alamos Laboratory. Some say there were not African Americans at Los Alamos because there were few Black atomic scientists for Oppenheimer to recruit, but exact reasons are unknown. As of right now, there is no evidence found of African Americans working at Los Alamos before 1947.

Women's Army Corps members (WACs) served at Los Alamos, with a peak of 260 WACs in August 1945. WACs were involved with almost all departments. Roles included scientific researchers, librarians, clerks, telephone operators, hospital technicians, cooks, and drivers. Many roles involved handling highly classified material.

Native American and Hispanic people worked at Los Alamos too. The Los Alamos site managers hired many local Hispanic, Spanish-speaking, and Pueblo people as maintenance and custodial workers. Men worked in construction, as truck drivers, carpenters, and gardeners. Women worked as maids and provided child-care.

The Atomic Bomb

Many tests at Los Alamos labs included experiments to understand implosions. Scientists completed tests at sites like [Q-Site](#) and [K-Site](#). Another example was the [L-Site](#), a firing site to study bomb remains. There were other important locations at Los Alamos. These provided space to construct and assemble components and conduct tests and research. Laboratory scientists had to work across buildings and sites to find solutions. Months of research and tests resulted in "the Gadget." The Gadget was the first atomic device. Scientists detonated it on July 16, 1945, at the [Trinity Site](#).

Questions for Reading 1 and Photos

1. Why were Native American and Hispanic individuals moved from land in the Los Alamos region?
2. Think about the Los Alamos Ranch School changing from a school to a place where they built the first nuclear bomb in World War II. How did this shift show what the government thought was important during that period?

3. Explain why there may have been no African American scientists at Los Alamos before 1947. Think about the history at that time and what things might have affected this situation.
4. Who, and what work, in Los Alamos County contributed to the home front efforts that led to eventual victory in World War II?

Reading 2: Interview

Interview with Dr. Julia Maestas (excerpts)

Background: Dr. Julia Maestas' grandfather was a homesteader who lost his land when the federal government took the land for the Los Alamos laboratories. Her father worked as a civil guard for the Corps of Engineers. She grew up and went to school in the area. The [interview](#) is courtesy of the Atomic Heritage Foundation, Voices of the Manhattan Project.



Figure 5: Dr. Julia Maestas, who grew up at Los Alamos (Credit: Atomic Heritage Foundation)

Dr. Julia Maestas: . . . My grandfather was Manuel Sabino Maestas, and he homesteaded up at Los Alamos. He had, as I understand, about eighty acres up there. He made a pond up there. He had timber, and he had sheep, and he had horses, and he had cows. He built a house of stone up there.

My father lived up there. My cousin, Adele Tometich, who now lives in Santa Fe, lived up there. I understand that they lived up there during the summer. Then they came down here and lived in San Pedro during the wintertime.

That's pretty much all I know except that Grandpa never had any paperwork that we could follow. Therefore, when the homestead reimbursement, or compensation, or whatever it was, came to be, I didn't have the appropriate paperwork for that.

So, the family was not eligible for it. Which is really sad, because my cousin, Adele, who is now eighty-three or eighty-four, lived there during that time and remembers quite a bit more than I do. Of course, I didn't know anything about it. But, anyway, that's where my grandfather was. . . .

Daddy went up to Los Alamos. Apparently, he worked there for thirty-four years. He first went there in 1942, and he was "a civil guard with the Army Corps of Engineers" until Zia [Company] was developed or formed in 1946.

Willie Atencio, interviewer: Civil guard for the Corps of Engineers.

Maestas: Initially in 1942. Then in 1946, when Zia came about, he was a laborer there. Later on, he became a supervisor for the laborers. He worked there for thirty-five years. My mom worked at the hospital.

Atencio: Your mother's name, Eloisa?

Maestas: . . . I can remember she was a maid up at the hospital. I can remember visiting her there in the hospital. It was an Army hospital next to Ashley Pond. . . .

Atencio: During the war, do you remember what your father did while he was a civil guard? Did he ever talk about his work?

Maestas: Never.

Atencio: Your father never talked about his work?

Maestas: Oh, no, and I was too little even if he had talked about it. I wouldn't have understood. All I remember about living in that Quonset house was that the latrines were outside. We didn't have running water inside. It was very small. It was an L shape. Then I had a really good friend by the name of Crystal. . . . I don't have any ideas as to what her last name was or anything. Anyway, she became my really good friend. I think it was through her that I learned to speak English, because I was a Spanish speaker. . .

Atencio: Okay. You went to school as a first grader in Los Alamos?

Maestas: Well, as I was telling you before, I remember first going over there and that it was a room about this size. It looked like it was either a conference room or a library. It was not a "school." I can remember there were tables. I can remember that the teacher for some reason – I was a Spanish speaking kid, and I can remember–

Atencio: Do you remember the teacher's name?

Maestas: No. I can remember the teacher asking me what the word "chore" was. I'd never heard the word "chore" in my whole life. Apparently, it really embarrassed me, because I can still remember that I didn't know the word "chore." I think it really, really embarrassed me, but I didn't know English.

That's all I remember except that it was a beautiful building. I think it was wood. I think it had a lot of books. It must have been either a library or conference room, and it must have been an Army building. . . .

I can remember sitting in the school. There were explosives. They went boom. The windows would rattle. This happened frequently, but I can remember sitting there and looking out of

this window after the boom of whatever was happening, but that's all I remember about anything. Nobody talked about it, because it was all so secretive.

Atencio: Did you have a badge to get into town?

Maestas: Yeah, we all did. We had to stop, even children. They fingerprinted us, and they gave us whatever. Because we used to live in Los Alamos during the week and down here in San Pedro during the weekends, we'd go back and forth.

I can remember having to stop there, and they would check us out. I think I could even remember being fingerprinted, but I was really small. I can remember the guards up in the tower. I haven't thought about any of this for years.

Questions for Reading 2

1. How was Dr. Maestas' grandfather and family impacted by the development of Los Alamos County?
2. What memory does Dr. Maestas have of her experience at school in Los Alamos as a first grader? Why may this stand out to her? (*Background: Many Hispanic families and homesteaders in the area were Spanish-speaking, and children began to attend the English-speaking schools with children of those who moved to the area for the Los Alamos laboratories.*)
3. Think about Dr. Maestas' memories of explosives and fingerprints, along with the secretive community. What are some emotions you think children growing up in Los Alamos may have had?

Photos



Figure 6: Special Engineering Department (SED) troops at Los Alamos. (Credit: U.S. Department of Energy)



Figure 7: Moving “Jumbo.” (Credit: Atomic Heritage Foundation)

Reading 3: Memoir (Excerpt)

Teacher Tip: You may wish to show [this video of “Jumbo”](#) for students to better understand and visualize the device described by Bederson in his writing. Jumbo was a steel cylinder 10 feet in diameter and 25 feet long that cost \$12 million. Its walls were 14 inches thick and the entire device weighed 200 tons.

Background: Benjamin Bederson (1921-2023) was an enlisted soldier in the U.S. Army’s Special Engineering Detachment (SED) in Oak Ridge and Los Alamos in 1944—1945. He spent time on [Tinian Island](#), the launching point of the atomic bombs dropped on Japan. He discharged in 1946 and 55 years later, wrote his [personal memoir](#). He went on to finish college and graduate school, becoming a professor of physics.

“SEDs at Los Alamos: A Personal Memoir” (Excerpt)

By Benjamin Bederson

In a month or two I was called to a small meeting of SEDs who like myself were working on various aspects of explosives. At the meeting we were greeted by the head of the Explosives Division, George B. Kistiakowsky. “Kisty” was a professor of chemistry at Harvard, one of the most distinguished chemists in the world, as I was to find out later. He had a strong Russian accent, and was very approachable and good-natured. The purpose of the meeting was to let the GIs know what was going on at Los Alamos. He laid it all out, from beginning to end. The story that circulated later about how security was so tight on the Manhattan Project that people only knew exactly what they needed to know to do their job was simply untrue. He explained nuclear fission, critical mass, and the implosion concept among other things.

None of this was needed for my job, which, it turned out, was to help create something called Jumbo. Jumbo was a huge cylindrical container into which was to be placed the first “Fat Man” to be tested. Fat Man was the name of the implosion bomb (generally referred to as the “gadget”), and Jumbo was intended to contain the radioactive material if the nuclear explosion failed, but if the TNT explosive lenses would do enough damage to spread deadly radioactivity from the unfissioned plutonium. Jumbo was to prevent this radioactivity from spreading all over the landscape – and, incidentally, making it possible to recover the unspent plutonium for another try. That was why I was testing containers! Everything fell into place with Kistiakowsky’s revelations, from the mysterious distillation plants in Oak Ridge to the overwhelming secrecy of the entire project. The only thing I had cause to be miffed about was my faded hope that the Manhattan project would get me back to New York. Still, the thought that somehow I had landed in the middle of what was certainly a historic enterprise was exhilarating and inspiring. . . .

All SEDs were assigned to a special barracks; other soldiers such as MPs and guards were quartered elsewhere. (When I arrived there was only one SED barracks, although a second was soon built.) There was an interesting dichotomy in our daily lives. While working in the Tech Area or elsewhere we were treated like the civilian workers, with privileges compatible to our jobs and responsibilities. However, at other times we were simply soldiers like all other soldiers, with a lieutenant in charge of the SEDs and a major in charge of all soldiers . . .

But living in one large room with 49 other soldiers was hardly a pleasant experience. The latrines were public, as were the showers. Heat was supplied by two or three coal stoves per barracks, and these had to be stoked by volunteers, especially in the early morning when it tended to be very cold. I had to perform my share of this onerous chore. Of course none of us, including me, really resented our lot. We were all too well aware that there were soldiers fighting and dying while we had to suffer relatively unimportant inconveniences,

while performing exciting and important work. Thus, our gripes were not taken very seriously, either by the Army or by ourselves. Probably the most serious complaint the SEDs had concerned relative rather than absolute treatment. Young civilians and SEDs (and even some Navy Ensigns) often worked side by side with comparable responsibilities, sometimes with SEDs ranking higher than civilians. But the civilians not only did not have to put up with Army discipline, they also were far better paid. This did not make very good sense to the GIs whose monthly checks often did not reach higher than two digits. In late spring of 1945 I received a letter from my father framed in black ink. He informed me that my close friend Irving Yusin, who had shared living quarters with me in Philadelphia for six months before I was drafted in 1942, had been killed in the Battle of the Bulge. This essentially trivialized my so-called hardships, putting them into the proper perspective of the year 1944.

Questions for Reading 3 and Photos

1. Why were “Kistiakowsky’s revelations” meaningful to the author?
2. What was the purpose of the container called "Jumbo" in relation to the first "Fat Man" test? How did the author contribute to the project?
3. Examine the difficulties that soldiers like the author encountered at Los Alamos on the home front and contrast them with the challenges faced by soldiers overseas. How were their experiences unique, and what shared aspects connected their stories?
4. *Optional discussion, if students read texts in separate groups:* Students share their summaries, using the reading questions as a guide for their summaries, and then engage in discussion to compare the experiences of Dr. Julia Maestas (Reading 2) and Benjamin Bederson (Reading 3).

Lesson Closing

Answer the essential question: How did Los Alamos County, NM develop as a home front city, and what was the impact on those who lived or moved there?

Extension Activities

1) Kwage Mesa Trail Wayside Markers

The Kwage Mesa trail, managed by Los Alamos County, is located on the Pajarito Plateau. It overlooks Bayo Canyon, where testing was done for the Manhattan Project. Use the following images and descriptions of the wayside markers to better understand the history

of the land and its development. Compare the information from the markers to what has been learned in the readings on Los Alamos County so far.

If time allows, students may design their own wayside that they feel would contribute to the understanding of the place's history.

- [An Explosive History](#)
- [A Volcanic Landscape](#)
- [Pueblo Communities](#)
- [Hispano Communities](#)
- [Now We Have Our Bomb](#)
- [Cleaning Up Bayo Canyon](#)

Teacher References: Planning and Creating Wayside Exhibits

- [Wayside Exhibits: A Guide to Developing Outdoor Interpretive Exhibits \(Wayside Guide\)](#)
- [Wayside Planning - by Harpers Ferry Center](#)

2) African Americans and the Manhattan Project

“The existence of Black atomic scientists within a culture which denied Black men’s intellect demonstrated the possibilities of science as an egalitarian career. That there were so few was a testament to the structural racism of American education.”

- Shane Landrum, *“In Los Alamos, I Feel Like I’m a Real Citizen’: Black Atomic Scientists, Education, and Citizenship,”* (master’s thesis, Brandeis University, 2005), 2.

African American scientists and workers were not at the Los Alamos site. As Landrum describes, there were layers of discrimination and racism across many contexts that contributed to the lack of African American scientists at Los Alamos. However, Black scientists contributed to the Manhattan Project at [Hanford](#) and [Oak Ridge](#), and scientists contributed at smaller sites such as in New York and Chicago.

Select a scientist’s profile from [“African Americans – Manhattan Project National Historical Park”](#) and share a summary of the person’s contributions.

Other resources include:

- “African Americans and the Manhattan Project;” Ruffin, Taylor, and Mack, *Freedom’s Racial Frontier*
- [African Americans and the Manhattan Project - Nuclear Museum](#)

- [African Americans at Los Alamos and Oak Ridge: A Historic Context Study \(nps.gov\)](#)
- [African-Americans and the Manhattan Project - Ranger in Your Pocket, Nuclear Museum](#)

Additional Resources

[A history of Los Alamos, New Mexico \(nmt.edu\)](#)

[Before and After - Manhattan Project National Historical Park \(U.S. National Park Service\) \(nps.gov\)](#)

[Civilian Displacement: Los Alamos, NM | Atomic Heritage Foundation](#)

[Dick Skancke \(Manhattan Project Security Guard\) discusses Security Checks - Video](#)

[Fuller Lodge \(U.S. National Park Service\) \(nps.gov\)](#)

[Los Alamos, NM - Ranger in your Pocket](#)

[Manhattan Project: Places > LOS ALAMOS: THE LABORATORY \(osti.gov\)](#)

["Sense of Place" Los Alamos Documentary Video \(24:45\)](#)

[The Women's Army Corps at Los Alamos— The Manhattan Project - Video](#)

Lesson 2: Historical Perspectives on the Atomic Bomb created at Los Alamos, Los Alamos County, New Mexico, WWII Heritage City

About this Lesson

This lesson is part of a series teaching about the World War II home front, with [Los Alamos County, New Mexico](#) designated as an American [World War II Heritage City](#). The lesson contains photographs, a newspaper article, and two poems to compare. Los Alamos County, New Mexico, was a site of development and final testing for the atomic bomb for the [Manhattan Project](#). Selected resources contribute to learners' understandings of multiple perspectives of the use and impact of the atomic bomb in World War II. There are two optional extensions: one is the firsthand observations of Dr. Fermi at the Trinity test, and a second is reflecting on the story of Sadako Sasaki's Origami Cranes.

Objectives:

1. Describe the connections between Los Alamos and the creation, testing, and eventual use, of the atomic bomb and the Manhattan Project.
2. Contrast the viewpoints of individuals involved in the creation and testing of the atomic bomb with those who experienced its devastating effects.

Materials for Students:

1. Photos: Figures 8-14 (*can be displayed digitally*)
2. Readings 1, 2, 3
3. *Recommended:* [Los Alamos Map by Manhattan Project National Historical Park](#) and [Technical Areas Map](#) by Los Alamos Neutron Science Center
4. *Extensions:* Additional reading; Sadako Sasaki's Origami Cranes digital media

Getting Started: Essential Question

How did the perspectives of those who were involved in the creation of the atomic bomb compare to the perspectives of those who experienced its devastating impact?

Photos



Figure 8: "Oppenheimer oversees final assembly of Gadget." The "Gadget" was tested in the Trinity test on July 16, 1945. (Credit: Los Alamos National Laboratory, Department of Energy)



Figure 9: "Jumbo" and a collapsed tower after the Trinity Test. Jumbo was designed to hold the "Gadget" to save plutonium. It was deemed unnecessary and suspended from a tower during the Trinity test. It survived the explosion. (Credit: Atomic Heritage Foundation)



By the numbers:

- 13 pounds of weapon-grade plutonium were in the Gadget
- 200 miles: the distance from the Los Alamos Laboratory to New Mexico's Alamogordo Bombing and Gunnery Range, where the Trinity test was conducted
- [Radioactive fallout from the Trinity test](#) descended to the northeast in New Mexico over an area about 250 miles long and 200 miles wide.



Quotation to consider:

"On July 16, 1945, the atomic genie burst from its vessel and it lit up the desert sky with a flash of blinding brilliance. The explosion equaled 20,000 tons of TNT. The scientists who observed the world's first nuclear blast reacted with a mixture of awe, relief, solemnity, pride and later, for many, the realization that their 'gadget' might change the world forever-it did."

- *Dateline Los Alamos*, a Laboratory publication, on the Trinity Site test explosion



Read to Connect

Reading 1: Newspaper Article

Atom Bomb Builder: Oppenheimer Defends Invention; Sees Great Benefits in Power

News-Pilot (San Pedro, California), Sunday evening, August 17, 1945, p. 3

By John B. Curtis

Los Alamos, N. M. (AP)-- Dr. J. R. Oppenheimer, credited by the war department with being chiefly responsible for the atomic bomb, was a 'little scared of what we had made.'

The 41-year-old director of the Los Alamos project where much of the laboratory work on this nation's new weapon has been done, said it could be made 'a matter of life or death for the world.' As a scientist, he has no apologies for having achieved what the war department described as 'implementation of atomic energy for military purposes.'

‘It is fair to say that no scientist would be honestly or conscientiously a scientist if he believed that the advancement of human knowledge were a bad thing,’ Dr. Oppenheimer said in an interview. ‘A scientist cannot hold back progress because of fears of what the world will do with his discoveries.’

Great Changes Seen

The slender, blue-eyed physicist, who longs to get back to his horses on his ranch 50 miles from here, expressed the belief that world changes in the next 20 years as the result of harnessing atomic power will be more marked than those wrought in the score of years following Faraday’s work with electricity.

“American statesman, if supported by the American people, should be able to use this discovery and bringing together the nations of the world so that the peace which the overwhelming masses of the world’s people want may be achieved.

“We were at war and it was necessary and right for us to make bombs. In peacetime, a small fraction of the effort which has been put forth on this aspect of our project can and will bring about many things of lasting benefit to enrich human life.

“These peacetime possibilities are secret at the moment. But responsible men in our government are interested in them and are giving them study.

“If our discovery is widely used politically, it may help to reduce the chances of future war. This is a matter for the statesman, the statesman supported by the peoples of the world,” Dr. Oppenheimer said.

It is the profound hope of all the persons who contemplate working on peacetime application of atomic power “that the international situation will be such that it will not be necessary to keep their discoveries a secret.”

Vigilance Holds

Although Los Alamos’ big secret is out, there has been no relaxation of the vigilance which bars outsiders. Dr. Oppenheimer came to the project’s outside gate for this interview, broken by occasional summonses to a nearby telephone.

Slender and of medium height, his blue eyes reflect the great tension under which he has worked. Under his leadership the largest concentration of top scientists ever assembled in one place achieved in two years what under normal conditions would have taken generations. Perfection of the atomic bomb he says, was a job “which could not have been accomplished without co-operation.”

Photos

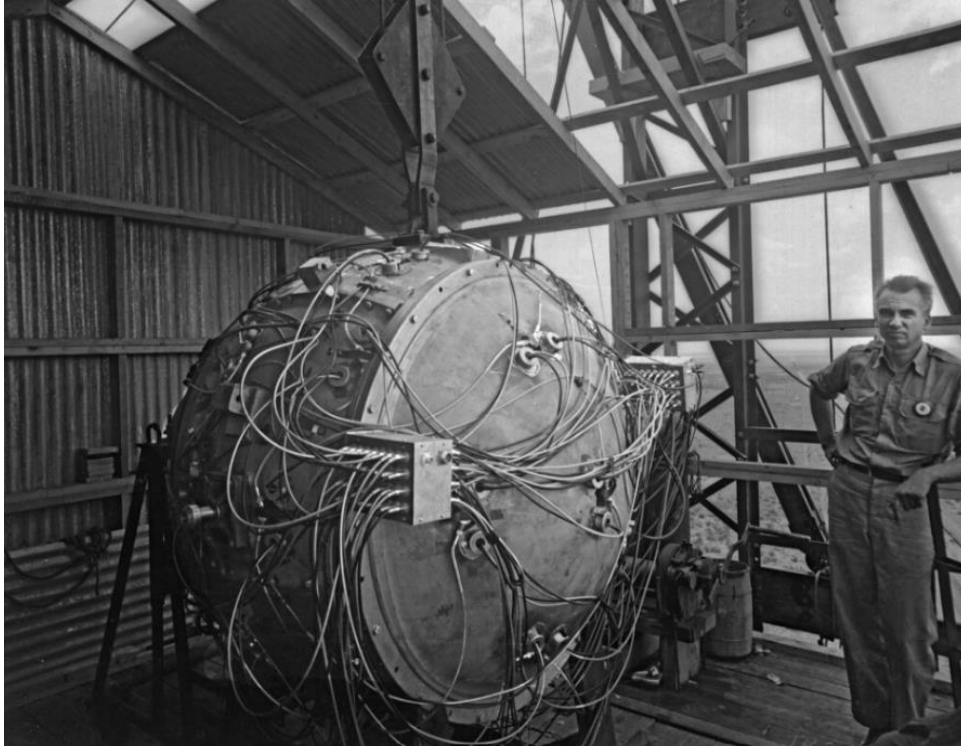


Figure 10: The Gadget with Norris Bradbury, head of bomb design, in 1945. The Gadget was used in the Trinity test. (Credit: Los Alamos National Laboratory)



Figure 11: The Trinity Test, 5:29 A.M. MST (Credit: Los Alamos National Laboratory)

Reading 2: Poem

Background: [Joan Hinton](#) was a physicist at Los Alamos, where she worked on developing nuclear reactors. On July 16, 1945 she and a colleague disobeyed precautions and observed the Trinity test from a hill only about 25 miles from the blast site. The Trinity test, completed at the [Trinity Site](#) was when the first atomic device, nicknamed “the Gadget” was detonated.

"Joan Hinton at Trinity"

By John Canaday, from *Critical Assembly*

The silence lingers longest. Though a new sun
boils above the desert, lifting tons of dirt and rock-dust miles into the sky,
the burning earth-plume rises without sound.
Even the wind, which had been gusting, stills.
Even the rain that came in quick showers
through the night. Even the lightning
striking the Oscura Mountains.
Even our hearts. Everything stops.
I sit on the cold sand, holding my breath.

Note: Shared with permission from Canaday, J. (2017). Critical Assembly: Poems of the Manhattan Project. University of New Mexico Press.

Questions for Reading 1, 2, and Photos

1. Oppenheimer compares the current work to Faraday's groundbreaking research in electricity. Faraday's work led to the development of electric generators and transformers, which have become essential to modern technology and power distribution systems. Why may Oppenheimer have compared the work to Faraday?
2. How does Oppenheimer view the role of political leaders and the international community?
3. Why may the poem (Reading 2) focus on the silence and stillness during the intense atomic bomb test? How does it make you think about the moment differently?

Photos



Figure 12: Plane over Nagasaki, Japan cloud, produced by the atomic bomb (Credit: Los Alamos National Laboratory, Department of Energy)



Figure 13: Over 3 months after the dropping of the atomic bomb on Hiroshima, a picture from Hiroshima on November 27, 1945 (Credit: Los Alamos National Laboratory, Department of Energy)

Reading 3: Poem

Tōge Sankichi completed his manuscript of poems, *Poems of the Atomic Bomb (Genbaku shishū)*, on May 10, 1952. Sankichi wrote, “Those incidents were of such great magnitude that there is no end to the cries of grief of all those who confront them; the true essence of these incidents is incomprehensible.” The [translated poetry collection](#) was translated by Karen Thornber, of University of Chicago. Shared with permission from the University of Chicago’s Center for East Asian Studies.

Teacher Tip: The following is an excerpt of the afterword and a poem excerpt. The afterword provides the author’s background and context for the poem. It may be useful for students to read this prior to the poem excerpt. If providing the full poetry collection, read in advance as mature content should be reviewed based on the age and maturity of your students prior to sharing.

Part 1: Afterword (Excerpt)

“The atomic bomb was dropped the morning of August 6, 1945, just before I left home for downtown, so I was more than three kilometers from ground zero. I suffered only cuts from shards of glass and several months of radiation sickness. But the people who had been within about a two-kilometer radius of the city’s center were not so fortunate: those who had been inside either died of shock or were buried alive and then consumed by fire and those who had been outside simply disappeared, burned to death, or, escaping with burns, died within a week. People who had been a bit farther away from the epicenter died within several months from either burns or radiation sickness. Those at a slightly greater radius barely survived. Families in the surrounding municipalities all had someone who had been sent by the neighborhood association to help clean-up after the evacuation effort and who never returned. Making the tragedy all the more difficult to bear were such factors as the rumor that Hiroshima would be consumed by fire the night of the fifth, a rumor started by the flyers dropped during an air raid over nearby towns and villages a few days before the bombing, and the mobilization of junior high school students and those in the lower grades of the girls’ schools to help in the evacuation effort. . . .”

Part 2: Excerpt from the poem “When Will It Be That Day?”

3.

and with the approach of August

little did you know,

that the Japanese army was without weapons,

that on the southern islands and in

the jungles

starving and sick, they'd been torn asunder

that their fuelless warships lay hidden and motionless on the other side of the

Island

that the entire populace was deluged in a shower of flames

that the fascists did not even know a way to end the war

little did you know, that once the Soviet power, which had defeated the Nazis,

confronted imperial Japan with the information

that it would not extend the nonaggression pact,

the world believed Japan's surrender

only a matter of time.

little did you know,

that because the swastika had been torn down

and the Red Flag raised quickly in Berlin

the Soviet entrance planned for three months later

was beginning to flutter larger in the skies of history.

(they hurried to drop the atomic bomb

they felt the need to crush Japan to pieces themselves before the arrival of that

day

with a dark and ugly will

they hurried to drop it

from the test in New Mexico on July 16

until the Soviet entry

there was so little time!)

4.

The night before midnight, the night of the fifth,
scattered from the sky came the certain rumor that Hiroshima would be
consumed
the people, running away to the surrounding mountains and watermelon patches
and staying up all night,
although frightened by the siren that would not stop
breathing a sign of relief when morning came without any bombing, returned to
their homes
and setting off to work, to insignificant jobs, they began to flood the streets of the
City
that morning August 6, at that hour

you sent your father off to the factory
you packed a lunch for your little brother who had just entered middle school
after that, sending your little sister off to play
like always, at your relatives' place in a separate part of town
you locked up the door of your rickety house and set out for your place of work,
mobilized labor
leaving today too to do unfamiliar work and be scolded
you were silent, halfway there, and hurrying,
when at some sign you threw yourself down
a flash hit you directly from behind
and when the dust cleared and you regained consciousness
despite all that had happened, you tried to grope your way toward the factory
you passed through waves of fleeing people, until you came to this place and sank
to the ground

a judgment of this incident hidden within you
in that way, meekly, you closed your eyes,
of which of your thoughts, young girl
at that time could you be certain
how could that earnest mind of yours have grasped the atomic bomb
those hands, yearning for the future, like small birds fallen to the ground
their wrists bent, lie outstretched on the ground
and those knees
as though feeling shame at lying down in such a place
are brought together and neatly contracted
only your hair, woven into braids
lies disheveled on the asphalt, you knew only war
the rainbow of your modest and restrained hopes was also reduced to flames . . .

Questions for Reading 3

1. How does the poem depict the haste and urgency behind the decision to drop the atomic bomb on Japan?
2. How does the poem describe the activities and thoughts of people in Hiroshima on the day the atomic bomb was dropped?

Synthesize

3. A “watershed moment” is an idiom that refers to an important event that changes the direction of history. July 16th is referred to in all three readings. How could this date be considered a “watershed moment” in history?
4. In reading 1, Oppenheimer was quoted: “A scientist cannot hold back progress because of fears of what the world will do with his discoveries.’ Considering your learning from the lessons, do you agree or disagree with this perspective? Why?
5. Answer the essential question using evidence from the texts: “How did the perspectives of those who were involved in the creation of the atomic bomb compare to the perspectives of those who experienced its devastating impact?”

Lesson Closing

Answer the essential question: How did the perspectives of those who were involved in the creation of the atomic bomb compare to the perspectives of those who experienced its devastating impact?

Extensions

1) *Additional Reading: “My Observations During the Explosion at Trinity on July 16, 1945” by E. Fermi*

The following document by Dr. Fermi was reviewed several times before becoming publicly released and unclassified. The special re-review final determination of unclassified was in July 1981.

On the morning of the 16th of July, I was stationed at the Base Camp at Trinity in a position about ten miles from the site of the explosion.

The explosion took place at about 5:30 A.M. I had my face protected by a large board in which a piece of dark welding glass had been inserted. My first impression of the explosion was the very intense flash of light, and heat on the parts of my body that were exposed. Although I did not look directly towards the object, I had the impression that suddenly the countryside became brighter than in full daylight. I subsequently looked in the direction of the explosion through the dark glass and could see something that looked like a conglomeration of flame that promptly started rising. After a few seconds the rising flame lost their brightness and appeared as a huge pillar of smoke with an expanded head like a gigantic mushroom that rose rapidly beyond the clouds probably to a height of the order of 30,000 feet. After reaching its full height, the smoke stayed stationary for a while before the wind started dispersing it.

About 40 seconds after the explosion the air blast reached us. I tried to estimate its strength by dropping from about six feet small pieces of paper before, during and after the passage of the blast wave. Since at the time, there was no wind I could observe very distinctly and actually measure the displacement of the pieces of paper that were in the process of falling while the blast was passing. The shift was about 2 ½ meters, which, at the time, I estimated to correspond to the blast that would be produced by ten thousand tons of T.N.T.

Additional Visual Resources

["Doctor Atomic" Trail - Nuclear Museum](#)

[Trinity Site, NM - Nuclear Museum](#)

2) Sadako Sasaki's Origami Cranes

"Two-year old [Sadako Sasaki](#) was at home in Hiroshima, Japan, on August 6, 1945, when the US dropped the Little Boy atomic bomb over her city. Sadako survived the bombing of Hiroshima but passed away ten years later from leukemia. Japanese folklore says that a crane can live for a thousand years, and a person who folds an origami crane for each year of a crane's life will have their wish granted. Sadako folded 1,300 origami cranes shortly before her death in 1955." -National Park Service

- Watch the [video](#) about Sadako Sasaki by The Manhattan Project National Historical Park.

Additional Resources

- [Hiroshima Peace Memorial Museum Peace Database \(hpmm-db.jp\)](#)
- [Debating the Atomic Bombs - Teachers \(U.S. National Park Service\) \(nps.gov\)](#)
- [Symbols of Peace in the Manhattan Project Communities \(U.S. National Park Service\) \(nps.gov\)](#)



Figure 14: One of the last origami cranes folded by Sadako was presented by her brother to the eldest grandson of President Truman in November 2015. This crane is on display at the Harry S. Truman Library and Museum. The crane is about 1-inch tall and is made of cellophane paper. (Credit: National Archives)

Lesson 3: Native American Home Front Contributions in Los Alamos County, New Mexico, WWII Heritage City

About this Lesson

This lesson is part of a series teaching about the World War II home front, with [Los Alamos County, New Mexico](#) designated as an American [World War II Heritage City](#). The lesson contains two primary source readings and one secondary source reading, with pictures. The primary sources provide insight on Native American contributions to the home front in Los Alamos: Dr. Floy Agnes Lee, a scientist and her role, in contrast to the usually limited employment opportunities for Native Americans. The secondary source builds on the primary source newspaper by sharing more about one Santa Clara Pueblo family, the Tafoya family. There is an optional, additional reading about a social event at Los Alamos that featured local Native American culture, and an opportunity to explore Pueblo pottery.

Objectives:

1. Explain how the impact of the development of Los Alamos County impacted the Pueblo people, including their work, art, and culture.
2. Compare historical descriptions about the work and culture of the Pueblo people and describe the evidence of discrimination they faced.
3. Reflect on the impact and contributions of Native American people to Los Alamos County and the home front efforts.

Materials for Students:

1. Photos: Figures 15-22 (*can be displayed digitally*)
2. Readings 1, 2, 3
3. *Recommended:* Maps such as [Los Alamos Map by Manhattan Project National Historical Park](#) and [Technical Areas Map](#) by Los Alamos Neutron Science Center
4. Extension: Optional reading; Pueblo pottery

Getting Started: Essential Question

How did Native Americans contribute to Los Alamos County and the home front efforts, such as through their work and culture?

Photos



Figure 15: Dr. Enrico Fermi and Maria Montoya Martinez, a celebrated Pueblo potterer. (Credit: Los Alamos National Laboratory, Department of Energy)

Read to Connect

Teacher Tip: To keep within the hour format, divide students into groups where each reads one of three readings and reports back with a summary of their findings. Each reading offers different perspectives and information.

Reading 1: Interview of Dr. Floy Agnes Lee, Los Alamos Laboratory technician

Note: Video and the full transcript of the interview can be found at [Voices of the Manhattan Project, Atomic Heritage Foundation](#). Between her two times working at Los Alamos, the first being during World War II, and the second post-war, [Dr. Floy Agnes Lee](#) worked at Argonne National laboratory in Chicago for 22 years and completed her PhD at University of Chicago.

Dr. Floy Agnes Lee (Lee): I'm a Pueblo Indian, half Pueblo and half white. My father's from Santa Clara Pueblo, and my mother was a German-American. She came from Indiana as a teacher to teach in the boarding school in Santa Fe, and met my Indian father, who was teaching tailoring, which he had learned there. Then they were transferred to Albuquerque Indian School.

At the Indian School, there were five of us that were born. I'm the fourth of the five siblings. I grew up in the Indian School, although I did not go to the school itself. I was sent to St. Mary's, then to Albuquerque High School, where I graduated. From there, I went to the University of New Mexico.

I was interested in biology, and I got my degree at the University of New Mexico. While there, I had a job helping one of the professors with his plants to see how they grew, and I put different solutions into each plant. That made me more interested in doing research.

When I graduated from university, the professor [Edward] Castetter, who was head of the biology department, asked me to stay another month and do some research for him, which I had been doing. It was recording information on what the Indians ate before the states became united. I had to go through different books, which were in the library, and pick out the information.

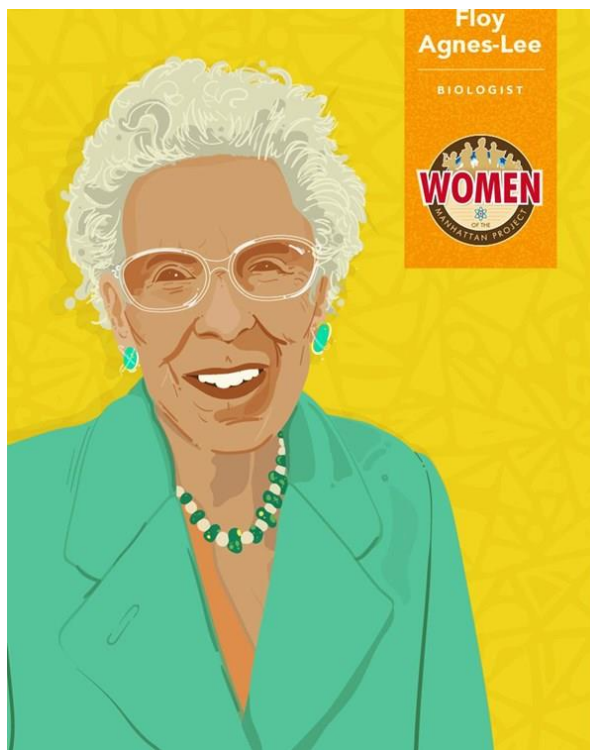


Figure 16: Illustration of Dr. Floy Agnes Lee (Credit: Department of Energy)

I hadn't quite finished doing the research. I was looking forward to going to Indiana after graduation to see my relatives, my white relatives on my mother's side. I was ready to go and he asked me, would I stay another month and finish the work? And I said, yes, yes, I will.

While I was doing the research for him, he got a call from Los Alamos. Los Alamos wanted a biology student or a graduate to come and work in the laboratory, the hematology laboratory. He asked me, would I like to go to Los Alamos and work there? I did not have a job lined up, so I said yes. That's how I got to Los Alamos. . .

It was 1945. The bomb was being developed at that time. My assignment was to collect the blood from the research men, scientists, who were working on the atomic bomb. I had to learn how to take blood, how to read the blood cells, what type of blood cell, and all that's connected with the hematology. I got along real well in that area. They sent me to go to different sites where the production was being done, and I would draw the blood from individuals.

Some of the scientists would come into the laboratory. When I worked in the laboratory, I was assigned certain people, certain scientists. One of them was Enrico Fermi. We got to talking about what I liked to do and what he liked to, and we got on the subject of tennis. Now, I did not know that this was [Enrico Fermi](#). I only knew him as a number, because they wouldn't give names out. So we would play tennis. This was before the bomb was dropped, and then afterwards also. He was a short man, and he had a funny little hat.

But anyway, after the bomb was dropped, the GIs who worked at the laboratory—they were engineers, we had three or four working in the hematology lab—came up and shook my hand and said, "You were the person who stuck the hand of the great Enrico Fermi."

I said, "What?"

They said, "Yes, Enrico Fermi."

I said, "Oh, I can't believe that." Because I was beating him in tennis every time. So when we went out to play tennis later, I didn't beat him. I tried not to. We became very, very good friends.

Los Alamos was a very, very interesting place. We were sort of like in a prison, but you could get in and out if you had the right cards. We could go to Santa Fe, which we did on certain occasions. There were recreations like ice skating and the tennis and all kinds of activities that went on. I lived in the dormitory where several other women lived. . . .

At Los Alamos, there was a radiation accident after the bomb was dropped, and fourteen people [*misspoke: eight people*] were involved. [\[Louis\] Slotin](#) was the principal person who was attending the assembly of the fission of the particles of the atom bomb. An accident happened and he was completely exposed. Behind him was [Al Graves](#). Al Graves was half irradiated, and the other half, he was shielded. I was assigned to take the blood of Al Graves and Slotin.

Al Graves, he wouldn't go to the hospital, he wanted to stay home. So I had to go to his house to take his blood. One day I took a sample and read it, and it was very, very low. His white blood cells were very, very low. Everybody in the lab said, "Oh, Aggie, you must have made a mistake. Go on back and get another sample."

I said, "Okay." But I wondered if I was going to give myself away, and let him know what was going on. Because I felt that I had done the right thing. I went back and got another sample and read it and someone else read it. Sure enough, his white blood cells were so low that they didn't even understand why he was still living. Tell you more about him later.

Slotin began to increase in size. He became—I don't know how to say it. Like a balloon. It was difficult to take his blood. I finally had to take it from the ear. His mother and father were called, because they knew he wasn't going to live. It was just nine days after the accident.

I was taking his blood, and his parents came and stood in the doorway and looked in and saw him. He was just like that, just bloated, and the look on their face was terrible. I got out of there. Sure enough, the next day he died of radiation poisoning.

I'll go back to Al Graves. He cooperated in every sense, not cutting his hair or shaving his beard—I mean mustache, whatever. He went around with a normal face, and the other face was terrible. But he came through this very well. I don't remember how long it took before his hair started growing back again, and his eyebrows.

I was at a meeting at Argonne, and I met Al Graves, who was talking with the director of the laboratory. The director was a very snooty person; he didn't like for anybody to interfere with him. He'd rather have the elite around him and talking to him. But I hadn't seen Al Graves for ten years, and I ran over and just hugged him, and he hugged me, and the director, "Oh!" He wondered what was going on. We remained very good friends. He and his wife and I and several other people from Los Alamos would go skiing in Colorado, and I went hiking with them. That was when I came back from Argonne on vacation. . . .

Reifel: . . . I mentioned to her that you told me that they weren't sure if they would hire you because of your father being from Santa Clara.

Lee: Yes.

Reifel: And it was too close.

Lee: Yes. They felt that my father being Santa Clara, born in the Santa Clara Pueblo, although he was not living there anymore, and all his relatives were and my relatives were. They decided that maybe I shouldn't be able to work at Los Alamos, because he might get secrets, and I don't know how he would do it. But finally they said, "Okay, you can go, but your father can't come visit you. He can't get near the lab." But I could go visit him. That's the way we did it.

Finally, after the bomb was dropped, I got my father up to see what I was doing and where I worked. Everybody in the dormitory, the rest of the women's dormitory and the men's dormitory, we all got together and had a little party for him. He enjoyed it so much.

Kelly: I bet he was very proud of you.

Lee: Well, I guess.

Kelly: You got that. Were there many other people from the Pueblos working at the laboratory?

Lee: There were, yeah. The chef was Santa Clara. My technician was Maria Martinez's aunt. Her name was Pilar Aguilar, and she was my technician at Los Alamos the second time I came back.

I don't know if at the time when I was there, that there were any other Indians working in the same capacity I was. I almost didn't get hired at Los Alamos the second time, because I was a minority. It was one of the reasons. The head of the division I was to be in did not like minorities. Because I was an Indian. I just didn't ever realize why he had it against me. . . .

Questions for Reading 1

1. Who is Dr. Floy Agnes Lee, and how did she end up working at Los Alamos?
2. What was Dr. Lee's role in the hematology laboratory?
3. Think about the challenges and opportunities Dr. Lee faced as a woman with mixed heritage at Los Alamos. How may have her personal experiences affected her relationships and decisions?
4. If you were studying the stories of people with different backgrounds at Los Alamos, how might Dr. Lee's experiences help you understand the social dynamics among scientists during the atomic bomb development?



Quotation to consider:

“As already noted, we had neither latrine duty nor KP (Kitchen Patrol) – these were performed by hired local women, Mexican and Indian.”

- Benjamin Bederson, in his [memoir](#); he was a soldier who was on assignment at Los Alamos with a US Army Special Engineering Detachment

Reading 2: 'Hermits of Los Alamos,' Who Built Atomic Bomb, Live Normal Social Life: U.S. Engineers Give First Look into Community

Democrat and Chronicle (Rochester, New York), October 3, 1945; p. 7

Teacher Tip: Have students highlight, or note, the information about “Indians” as they read to then analyze.

By: Harold Heroux

Los Alamos, N.M. -- (INS)-- What does it take to make atomic bombs—beside uranium, brains and a couple billion dollars?

The U.S. Engineers gave the answer yesterday to that question. It takes people, a motley lot of ‘em, who are willing to live apart from the civilized world—and who can keep a secret.

The curtains were drawn open as a handful of newsmen—the first outsiders to visit the atomic bomb project laboratory, hidden in the mountains 40 miles from Santa Fe—could see how 6,000 persons at the heretofore secret community eat, sleep, shop and play.

Shortley after the scribes arrived, their eyebrows were lifted a bit as they heard the roar of a remote explosion that made the Jemez Mountains quiver.

‘That’s nothing but a little bang,’ quickly explained Com. Norris E. Bradbury, the naval officer who is acting project director. ‘We are still doing some experimenting.’

All Part of a Team

One reporter asked a timely question-- ‘How much danger are the employees of Los Alamos working under?’

‘None whatsoever, except the casual accidents that might take place in an industrial plant,’ Commander Bradbury replied, without elaboration.

The tour continued and many, varied characters were found. Each is a part of the Los Alamos team—the team that perfected the atomic bomb—whether he is a world-famed scientist or one of the Indians who pours soup in a Los Alamos cafeteria.*

Members of the Los Alamos team—the brain of the entire atomic bomb project—have been toiling under military guard for three years. Let's take a look at some of these people.

First, one finds Dr. Otto R. Frisch, physicist and nephew of the famed Dr. Lise Meitner. Like many other refugee scientists who worked on the project, he came to Los Alamos from England in December, 1943.

Guarded Carefully

What Dr. Frisch has done—and is doing—is a secret, like all other matters that take place in the carefully-guarded technical area at Los Alamos.

But, we can say that Dr. Frisch, unlike many other top-ranking scientists at Los Alamos, is quite a pianist. And like the other talented members of America's most hush-hush community he plays regularly over KRS, Los Alamos' own radio station.

Then there is Cleto Tafoya, ex-governor of the Santa Clara Indian Pueblo, one of hundreds of Indians on 'the team.' The ex-governor toils in a cafeteria. His wife and daughter also work at Los Alamos.

Next, there is Capt. J. Brooks, an Army doctor from Chicago. He handles 200 patients daily at his hospital, but is mum—very mum—when you question him about radioactivity and kindred atomic ailments.

Mrs. Shelton Musser, of Reading, Pa., wife of an Army captain, said that the vast majority of the 'atomic crowd' like their hermit-like existence. She pointed out that the people of Los Alamos live a 'normal social life,' with clubs, little theater groups, choirs and other things of their own, even a symphony orchestra.

"Lot of Us Wives Work"

'A lot of us wives work, too, in the technical area. There is no keeping up with the Joneses here. .. It's a good place to enjoy outdoor life and to wear old clothes.'

Three years ago few of Los Alamos' 'six-thousand' knew what the U.S. Engineers were doing up in the mountain, except working on a secret project. Now, they know about the atomic bomb – and now, they are hopeful that the continuing project will bring some peacetime uses.

But the people of Los Alamos—from top-ranking scientists down to Indian servant girls—are permitted no visitors from the 'world outside.'

This has made the hidden community a haven for harassed husbands seeking to live apart from troublesome in-laws.

A council of six—composed of representatives from all walks of life—regulates life in Los Alamos.

Army's in Charge

Of course, the U.S. Army is in charge and surrounds the entire community and its super-secret technical area with a corps of military police. But Col. Gerald R. Tyler of the U.S. Engineers, the commanding officer, decided his vast horde of scientists, technicians, instrument makers and other civilians should have a voice in running the community.

'You might say that our community council is something like town councils of the New England states, although the powers of our council are all extra-legal,' said Colonel Tyler and Commander Bradbury.

It seems that the 'brain trust' holds the greatest number of seats on the Los Alamos Council, following the recent elections in which there had been spirited campaigning.

Three Council members hold the degree of doctor of philosophy, which speaks well of scientists-turned-politicians. Wives at Los Alamos organized a bloc and won a Council berth for one of their group. And the many Spanish-American workers at the project also have one of their number sitting on the Council.

A committee from the Council deals with civilian law breakers—that is minor offenders. A U.S. Marshal would be called for any major crime. The Army, with its court martial setup, deals with GIs and WACs who run afoul of the regulations.

While the Council's committee has no legal right to assess fines to violators, such as auto speedsters, it operates as a court and the fines are turned over to the Red Cross.

The Council even decides who can have a servant, if any, in his or her home.

A housing committee rations the servants, mostly Indian girls. A mother with three children is allowed a servant for three days; a family with two children rates a servant two days a week, and so forth. Wealth of pre-Los Alamos background has no bearing on who can hire servants.

To keep pace, the Army officers do without orderlies.

Yes, it is a common sight to see some famed physicist or perhaps a Nobel Prize winner—whose names are part of the history of science—diapering a baby or sweeping his porch. At

the same time, one might also see Joe Blow, an unheard of worker with a wife and a flock of kids, employing a maid for the first time in his life.

That's life in Los Alamos—and, according to Tyler and Bradbury, it is a democratic way of living.

Questions for Reading 2 and Quotation to Consider

1. What are some of the different roles described at Los Alamos?
2. How did Cleto Tafoya's work at Los Alamos differ from that of Dr. Otto R. Frisch and Capt. J. Brooks? What other descriptions in the article show discrimination against Native Americans and their work?
3. How does the article describe the organization and government of the Los Alamos community?
4. Put yourself in the shoes of someone living in the Los Alamos community back then. How do you believe this way of living, with people from different backgrounds and jobs coming together, would affect how they see things, get along with each other, and feel like they're part of a group?
5. The title of this article describes those who built the atomic bomb as living a “normal social life.” How does what society defines as “normal” or acceptable differ based on perspectives, and change over time?

Photos: Tafoya Family and Pottery



Figure 17: Parkhurst, T. Harmon. Cleto Tafoya on left with unidentified man, Santa Clara Pueblo, New Mexico, 1925 – 1945? Courtesy of the Palace of the Governors Photo Archives (NMHM/DCA), T. Harmon Parkhurst Collection, Negative No. 004494.



Figure 18: "Severa Tafoya Santa Clara Indian Pottery Maker, N.M.," 1935. (Credit: Online Archive of California) This picture was taken nearly eight years before the development of Los Alamos by the government and US Army.



Figure 19: A cafeteria at Los Alamos, possibly where Cleto Tafoya was seen working as described in the newspaper. (Credit: Los Alamos National Laboratory, Department of Energy)

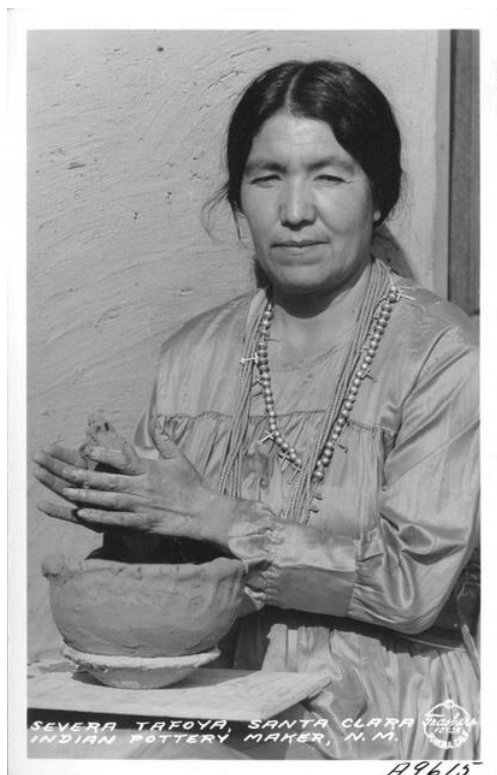


Figure 20: “Severa Tafoya Santa Clara Indian Pottery Maker, N.M.,” 1935. (Credit: Online Archive of California) This picture was taken nearly eight years before the development of Los Alamos by the government and US Army.



Figure 21: “Vessel Depicting the Water Spirit Avanyu,” completed between 1930 – 1950 by Severa Gutierrez Tafoya, wife of Cleto Tafoya. Medium: Blackened terracotta. “Severa Gutierrez Tafoya’s Tewa blackware pot is incised with a zoomorphic being, the legendary Avanyu (water serpent). Embodying both earthly and otherworldly phenomena, the Avanyu symbolizes clouds, rain, lightning, and watery places. It connects the terrestrial and the heavenly, becoming a sustainer of life in the temperamental desert landscape of the Southwest.” From the 2023 exhibition *Liquidity: Art, Commodities, and Water* at Hood Museum of Art (Credit: Hood Museum of Art, Dartmouth: The Alice Cox Collection)



Figure 22: Red melon bowl by Angela Tafoya Baca, daughter of Cleto and Severa Tafoya, completed in 1992. (Credit: Kenrossalex; Wikipedia)

Reading 3: Native American Artwork and the Tafoya Family

By Sarah Nestor Lane

In 1942, the Manhattan Project took the plateau, impacting local [Pueblo](#) groups who had lived in the area since time immemorial. They couldn't practice old traditions and had to move from their traditional lands.

Native American people worked at Los Alamos laboratories. Men worked mostly in construction, as truck drivers, carpenters, and gardeners. Women worked mostly as maids and provided child-care. There were some rare exceptions like Dr. Flay Agnes lee. However, discrimination and a climate of distrust prevented them from working in most of the higher skilled positions there.

The Los Alamos community developed a strong interest in the culture and pottery of talented Pueblo artists. One example was [Maria Montoya Martinez](#). She was a respected figure in her community. Los Alamos Laboratory employees were impressed by her art and her pottery gained worldwide recognition after the war. Los Alamos residents collected indigenous art pieces, like those created by Martinez.

Since time immemorial, Pueblo people have used pottery to store water and food, to celebrate special events, and for ceremonies. The clay is seen as sacred and used with prayer, thought, and song. According to “Stories in Clay” (Vilcek Foundation, 2023), European contact had led to changing styles to provide more uses for the pottery. There also was pressure for increased production, like from the scientists at Los Alamos. The demand for pottery as collectibles was different than some of the traditions of the Pueblo communities. The fascination by Los Alamos residents of indigenous artwork led to cultural exchanges, such as square dances and holiday feasts, between the Los Alamos residents and the Pueblo communities.

There are few accounts from Native Americans living near Los Alamos. Most written narratives come from scientists and their families who lived there. This leads to an unbalanced representation of information from non-Native voices.

A Local Pueblo Family: The Tafoya Family

In Reading 1 (newspaper article), Cleto Tafoya was briefly described: *“Then there is Cleto Tafoya, ex-governor of the Santa Clara Indian Pueblo, one of hundreds of Indians on ‘the team.’ The ex-governor toils in a cafeteria. His wife and daughter also work at Los Alamos.”*

Cleto Tafoya and his family members were important contributors to Santa Clara Pueblo government and artwork. Cleto Tafoya was a leader within the Santa Clara Pueblo government. He was selected as a member of a constitutional committee. In 1935, there were four Pueblo factions that came together to create a Santa Clara Pueblo Constitution. This Constitution was important to the Pueblo people of the area, as it set the foundation for working on political differences using a new council structure. Tafoya was a signing secretary in the final copy of the 1935 Constitution and Bylaws for the Santa Clara Pueblo ([US Department of the Interior, Office of Indian Affairs](#)).

It is not clear how or when Cleto Tafoya began working in a Los Alamos cafeteria. It is also unclear what work the newspaper is referring to for Tafoya’s wife and daughters at Los Alamos. Cleto Tafoya’s wife, Severa Gutierrez Tafoya, was a pottery maker. Much of Severa Tafoya’s pottery has unknown dates of completion, but several pieces may have been made during the time of Cleto Tafoya working in the Los Alamos Laboratory cafeteria, as described in the newspaper article. Two of their daughters, Mary Agnes Tafoya and Angela Tafoya Baca, also became well-known potters.

Angela Tafoya Baca specialized in melon pots. Her pottery is displayed at numerous museums and galleries. Her husband, Jose Baca, served in World War II as a private first class in the U.S. Army. His company, Zia Company, supported services at the Los Alamos Laboratories. Four of Baca’s children also went on to continue making melon vessels.

Note: The photo (below) of Cleto Tafoya and an unknown person is part of a [collection](#) by photographer Talcott Harmon Parkhurst. Parkhurst was the official photographer of the Los Alamos Boys Ranch School during most of its existence up until its closure for the Manhattan Project site in 1942. His collection also contains many pictures of Pueblo life in Santa Fe and the surrounding areas.

Questions for Reading 3

1. Who were the Ancestral Pueblo, and how did the Manhattan Project impact their native lands?
2. Why were Native American people primarily employed in certain roles at Los Alamos Laboratories during that time?
3. Describe the melon pots in the photos. What are some of the symbols used? How does art such as the melon pots connect to the culture and history of the land at Los Alamos?
4. Reread the newspaper quotation: *“Then there is Cleto Tafoya, ex-governor of the Santa Clara Indian Pueblo, one of hundreds of Indians on ‘the team.’ The ex-governor toils in a cafeteria. His wife and daughter also work at Los Alamos.”*

Now that you have more information from Reading 3, what new thoughts or wonderings do you have about how Tafoya was described and his work? If you could talk to Tafoya today, what questions might you ask him?

5. Think about how the Tafoya family was connected to the land, work, and culture at Los Alamos. How may the federal government’s takeover of land in Los Alamos County and the laboratories have influenced their family's history and artwork?

Lesson Closing

Answer the essential question: How did Native Americans contribute to Los Alamos County and the home front efforts, such as through their work and culture?

Extensions

1) Optional Reading: Newspaper Article

“San Ildefonso Pueblo Entertains Los Alamos Scientists and Wives”

The Santa Fe New Mexican; December 7, 1945, p.6

Teacher Tip: After students read this text, answer the questions from Reading 3 with new text evidence to consider and integrate into understandings.

The people of San Ildefonso Pueblo, famed for their pottery and paintings, were hosts to the scientists of Los Alamos last Saturday night, at a dance given at the community hall in the Pueblo. Some 200 people attended the event, at which dancing of all types was included in the program. The hosts, including the famous pottery-maker, Maria Martinez, and the artist, Louis Gonzalez, wore traditional colorful tribal costumes, and the guests were dressed in variations of Indian and Western garb.

Entertainment began with an exhibition of old time square dancing by couples from Los Alamos, to the music of accordion and guitar, furnished by Dr. William C. Elmore and Matt Sands of the Los Alamos group.

Guests were introduced to Governor of the Pueblo, Donicio Sanchez.

Several Indian dances were given, one of which was the Belt-Braiding Dance, performed by Richard, Adam and Anselmo Martinez, Mrs. Tomacita Sanchez, Esthel Virgil and Rosenita Pena. The three couples were accompanied by Migual Martiniz and Sotero Montoya on the tom-tom and with chanting. Later everyone joined in Indian folk dancing as well as the square dances.

As a special performance, T/5 Popovi Martinez and Richard Martinez, gave the War Dance. Corporal Martinez, Maria's son, who is stationed at Los Alamos, acted as master of ceremonies, and addressed the guests both in Tewa and English, announcing the numbers on the program. . . ."

The article continued by listing the names of "prominent guests," which included names such as "[Dr. Enrico Fermi](#) and Miss Nella Fermi," "Dr. And Mrs. [Eric R. Jette](#)," "Miss (Dr.) [Joan Hinton](#)," and other notable scientists.

2) Pueblo Pottery

Use the Tafoya family and Maria Martinez as a starting point for learning more about Pueblo pottery, an important artform to their culture. Examine photos and videos using the following resources:

[Pueblo Pottery: Stories in Clay \(vilcek.org\)](http://vilcek.org)

- Examine images of Pueblo pottery and learn the stories and meaning behind the pottery.

[Maria Martinez: Indian Pottery of San Ildefonso \(Documentary, 1972, VHS\) - YouTube](#)

- *Description:* "Maria Montoya Martinez and her son, Popovi Da demonstrate how Pueblo Indian Pottery is made using traditional methods. Filmed in San Ildefonso Pueblo, New Mexico. "Maria Martinez, noted Indian pottery maker demonstrates the traditional Indian ways, beginning with the spreading of sacred corn before clay is gathered. Also shown are the mixing of clay, construction of pottery, hand decorating, and building of the firing mound."

Lesson 4: Los Alamos County, New Mexico: Comparing and Connecting WWII Home Front Cities

About this Lesson

This lesson is part of a series teaching about the World War II home front, with [Los Alamos County, New Mexico](#) designated as an American [World War II Heritage City](#). The lesson contains photographs, reading, and primary sources, with an optional activity, to contribute to learners' understandings of the area as a WWII Heritage City. It combines lesson themes from the three other lessons in the collection to summarize the city's contributions and encourage connections to the overall U.S. home front efforts.

Objectives:

In a culminating product:

- a. Identify important World War II home front location(s) in Los Alamos County, New Mexico, and describe their historical significance
- b. Summarize the contributions of Los Alamos County civilians and service members to home front wartime efforts
- c. Evaluate the short- and long-term impacts of the contributions of the Los Alamos laboratories and The Manhattan Project
- d. *Optional:* Describe similarities and differences of Los Alamos County, NM and other Heritage city(s) / World War II home front(s), particularly those involved with the Manhattan Project.

Materials for Students:

1. Photos: Figures 23-26 (*can be displayed digitally*)
2. Readings 1, 2, 3
3. Maps, project materials (as needed)
4. Optional Activity: Virtual Field trips (links)
5. Student graphic organizers (See Figure 27 at end of lesson, for reference)

- Create Comparison Matrices for your students to use. To compare two cities, create a one-page sheet with three columns and four rows. Label the left column Theme/Topic and the other columns City 1 and City 2. For a Comparison Matrix for three cities simply add an additional column.
- Create two Single-Point Rubrics to assist students' self-assessment. One is for assessing proficiency in meeting teacher-selected standards. One is for assessing proficiency in meeting objectives.
- For the rubric on standards, create a one-page sheet with three columns and four rows of content. Label the first column "Areas for Improvement," the second column, "Proficient (Meeting Standard)," and the third column, "Areas of Exceeding Standard." Leave the first and third columns blank. In each row of the second column identify a Standard and indicate a space for noting the evidence for meeting the standard. Include a space at the bottom of the page for assigning points for each column.
- For the rubric on objectives, create a one-page sheet with three columns and four rows of content. Label the first column "Areas for Improving toward Objective," the second column, "Proficient (Meeting Objective)," and the third column, "Areas of Exceeding Objective." Leave the first and third columns blank. In the four rows of the second column identify these four objectives:
 - a. **Objective:** Identify important World War II home front location(s) in Los Alamos County, New Mexico, and describe their historical significance
 - b. **Objective:** Summarize the contributions of Los Alamos County civilians and service members to home front wartime efforts
 - c. **Objective:** Evaluate the short- and long-term impacts of the contributions of the Los Alamos laboratories and The Manhattan Project
 - d. **Objective (Optional):** Describe similarities and differences of Los Alamos County, NM and other Heritage city(s) / World War II home front(s), particularly those involved with the Manhattan Project.

Include a space at the bottom of the page for assigning points for each column. See the last photo of this lesson for reference.

Getting Started: Essential Question

Why was Los Alamos chosen as an American World War II Heritage City, and what are its similarities and differences to other home front cities?

Photos

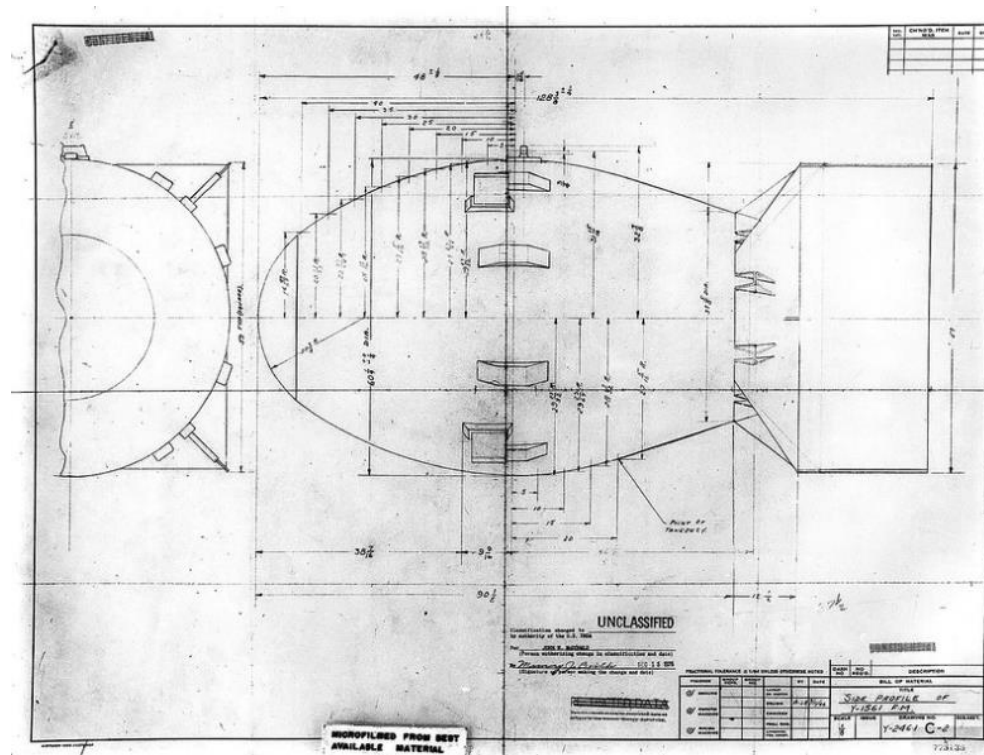


Figure 23: Diagram of the atomic bomb with the codename "Fat Man." The bomb was dropped on Nagasaki, Japan on August 9, 1945. (Credit: Los Alamos National Laboratory, Department of Energy)

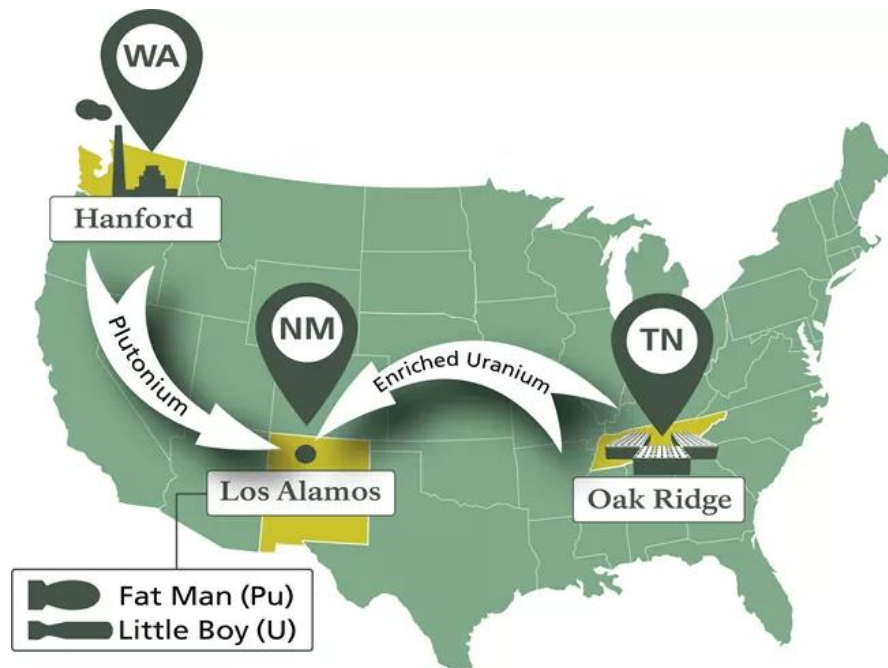


Figure 24: A map showing the locations of The Manhattan Project and the flow of plutonium from Hanford, and uranium from Oak Ridge to Los Alamos to create the atomic bombs. (Credit: National Park Service)



Quotation to consider:

“An anonymous young scientist at Los Alamos, New Mexico, has in more serious vein summed up the whole issue in a few words that pack an awful wallop:

‘The war just ended,’ he says, is the last victory.’

‘If it is not the last war, it is the next-to-last war.’

Think that one over.”

- “Atom Bomb Has Been Deadly Subject Right from the Very Start” by Peter Edson, *The Whittier News* (Whittier, California); November 9, 1945, p. 5



Read to Connect

Reading 1: The Manhattan Project and Los Alamos (Overview)

By Sarah Nestor Lane

There are three American World War II Heritage Cities connected to the Manhattan Project: [Los Alamos](#) (New Mexico), Tri-Cities ([Hanford](#), Washington), and [Oak Ridge](#) (Tennessee). Each had its own part in developing the atomic bombs.

The purpose of the Manhattan Project was to develop the first atomic bomb during World War II. It was a top-secret research project led by the United States, with the goal of building a powerful weapon before Germany or Japan could. The project aimed to harness the energy of nuclear reactions to create a devastating weapon that would help bring an end to the war.

The Los Alamos National Laboratory sites made important contributions to the Manhattan Project during World War II. The site was in Los Alamos County, in a desert, far away from everything, so they were able to secure the area, work without anyone finding out, and complete experiments. Hispanic ranchers and Native Americans were displaced from their homes and land there. Quickly constructed, large laboratory buildings were scattered along the south side of [Ashley Pond](#). Rows of four-family apartments were built near the mountains. Some raised board sidewalks were made to prevent muddy conditions during winter snow melting and summer monsoons.

Workers lived in the county and traveled to their work sites. The site played a crucial role in developing and producing the atomic bomb. Plutonium from the Hanford site and uranium from Oak Ridge was used to develop two kinds of bombs at Los Alamos. One was called

"Little Boy" and used uranium, and the other was called "Fat Man" and used plutonium. They evaluated two types of bombs: one was the gun method, where they used gun-like technology to bring together smaller amounts of material that wasn't quite enough to explode on its own, and the other was the implosion method. For the implosion method, they used explosives to squeeze a smaller amount of plutonium really tightly until it reached a point where it could cause a big explosion. Scientists combined materials in a way that created a chain reaction, where the splitting of one atom led to the splitting of more atoms, releasing a huge amount of energy.

Los Alamos not only worked on the science and building parts but also on the plans to put everything together. Finally, on July 16, 1945, they did a test with a bomb called the "Gadget," called the Trinity Test. It was the first time a nuclear bomb was exploded. All the experiments and hard work in Los Alamos had culminated in this scientific milestone. Although an achievement for the scientists, the two bombs dropped on Japan resulted in thousands of Japanese civilians killed or suffered from injuries or exposure to radiation. With the atomic bombs completed and the war ending, the scientific community at Los Alamos faced a new chapter in history. It is still a national laboratory today.

Questions for Reading 1 and Photos

1. What was the main purpose of the Manhattan Project during World War II, and why was it considered a top-secret research project?
2. How was the Los Alamos laboratory similar and different to Oak Ridge and Hanford?
3. How did the Los Alamos National Laboratory contribute to the Manhattan Project's goal of creating atomic bombs, and what were the key scientific methods used to develop the bombs?

Reading 2: Newspaper Article

"Scientists Believe Atomic Bomb May Cause Unending War"

LOS ALAMOS, N.M., Oct. 13. (AP)-- *Ada Evening News* (Ada, Oklahoma), October 14, 1945, p.1

Foreseeing atomic bombs "thousands of times more powerful" than those dropped on Japan, 400 scientists who developed the weapon at the government's laboratory asserted in a statement today that to try to keep it from the rest of the world 'will lead to an unending war more savage than the last.'

Released by Dr. Robert R. Wilson, member of the executive council, on behalf of the association of Los Alamos scientists, the statement said: It is certain that nations other than the United States, Great Britain and Canada by research can produce atomic power.

This nation's highly concentrated industrial centers make it particularly vulnerable to such a weapon.

Counter-measures would be 'extremely difficult and uncertain' because of the 'concentrated form of destructive energy' and 'the large number of possible methods of delivery.'

Advantage would lie with the aggressor. 'A single heavy attack, lasting a matter of minutes, might destroy the ability of a nation to defend itself further.' The bomb is 'a deadly challenge to civilization itself.'

'The use of atomic energy must be controlled by a world authority.'

The statement disapproved suggestions that the United States, Britain and Canada assume unilateral control over atomic power development.

'Such a policy will lead to an unending war more savage than the last,' the scientists said. 'We can not conceive of it leading to a stable, peaceful world.'

'We are convinced,' the statement continued, 'that we must cooperate with the rest of the world in the entire development of atomic power, and the use of atomic energy as a weapon must be controlled by a world authority.'

Expressing the belief that international control is technically feasible, the scientists said 'abolition of secrecy in national and international relations may be necessary,' providing free access to 'all laboratories, industries and military installations.'

Questions for Reading 2 and Photos

1. What did the statement from the group of scientists at Los Alamos say about the possible outcome if atomic power is kept secret from other countries?
2. How do the scientists explain why the United States is at risk because of its industrial centers when it comes to the use of atomic weapons by other countries?
3. Assess the scientists' argument about having a worldwide authority controlling atomic power development. Consider the reasons they provide and the impact it might have on global stability, weighing both the benefits and challenges they mention in the statement.

Photos



Figure 25: Example of housing area at Los Alamos National Laboratory (Credit: Los Alamos National Laboratory)



Figure 26: Area 17 Control Point at Los Alamos National Laboratory (Credit: Los Alamos National Laboratory)

Reading 3: Heritage City Designation

Excerpt from: “[House Report 115-998](#), “*To Direct the Secretary of the Interior to Annually Designate at Least One City in The United States as An ‘American World War II Heritage City,’ and for other purposes*” (October 30, 2018)

“ . . .PURPOSE OF THE BILL

The purpose of H.R. 6118 is to direct the Secretary of the Interior to annually designate at least one city in the United States as an “American World War II Heritage City”.

BACKGROUND AND NEED FOR LEGISLATION

On December 7, 1941, military forces of the Empire of Japan attacked the U.S. Naval Fleet and ground bases at Pearl Harbor in Hawaii. On December 8, 1941, one day after what President Roosevelt referred to as, “a date which will live in infamy,” the United States declared war against the Empire of Japan. Three days later, on December 11, 1941, Japan's ally, Germany, declared war on the United States. Sixteen million Americans, mostly young working-age men, served in the military during World War II, out of an overall United States population of 113 million.

While an unprecedented number of Americans served in World War II, the country drastically increased its war production on the home front, serving not only the needs of the armed forces of the United States but her allies as well--in what President Franklin Roosevelt called “The Arsenal of Democracy.” The combination of millions serving in the military, during a period of necessary and drastic increases in production, led to significant social changes on the American home front.

The World War II period resulted in the largest number of people migrating within the United States in the history of the country. Individuals and families relocated to industrial centers for good paying jobs out of a sense of patriotic duty. Many industrial centers became “boomtowns,” growing at phenomenal rates. One example, the City of Richmond, California, grew from a population of under 24,000 to over 100,000 during the war. . . .”

Questions for Reading 3

1. What was the purpose of the bill (H.R. 6118) according to the report?
2. Why do you think Los Alamos, New Mexico was designated as a World War II Heritage City? Use details from the bill and from the lesson(s) information.
3. Are there other cities you think of when considering home front contributions during wartime? Which, and why?

Optional Activity: Virtual Field Trips

Use virtual field trip videos to support comparisons among the Hanford, Los Alamos, and Oak Ridge sites. Learning from these can then be applied in the mastery product comparing two or more home front cities.

- [The Manhattan Project Field Trip - Oak Ridge and Los Alamos](#) - (Produced by The National World War II Museum)
- [Oak Ridge Virtual Tour](#) (Produced by American Museum of Science and Energy)
- [Ranger in your Pocket Virtual Tours](#) (Produced by the Atomic Heritage Foundation)
- You may also revisit videos used in other lessons, from [The Manhattan Project National Historic Park](#)

Culminating Activity/Mastery Product

To demonstrate student understanding, support students in creating a final product that meets the following objectives:

- a. Identify important World War II home front location(s) in Los Alamos County, New Mexico, and describe their historical significance
- b. Summarize the contributions of Los Alamos County civilians and service members to home front wartime efforts
- c. Evaluate the short- and long-term impacts of the contributions of the Los Alamos laboratories and The Manhattan Project
- d. *Optional:* Describe similarities and differences of Los Alamos County, NM and other Heritage city(s) / World War II home front(s), particularly those involved with the Manhattan Project.

Mastery products should be:

. . . **student-led**; Students work as individuals or in collaborative groups.

. . . **student-directed**: Students are offered a variety of choices for product type.

. . . **student-organized**; Teacher facilitates by providing students with the comparison matrices and/or resource links from throughout the series of lessons.

. . . **student-assessed**; Teacher supports student self-assessment and reflection by providing students single-point rubrics to assess for meeting standards and/or lesson objectives.

Note: Depending on time and scope, the comparison of Los Alamos to another WWII Heritage city(s) within the mastery product (objectives) may be omitted. However, comparing cities is recommended, as it connects students to a deeper understanding of the WWII home front.

Examples of mastery product choices include, but are not limited to:

- **Written:** Letter (opinion or informative), essay, poem, narratives, biography, articles, class book or children’s book, speech or debate (then presented orally), blog / website, plaque or historical displays, pamphlets or rack cards
- **Graphic Organizers:** timeline, flowcharts, mind or concept content maps, Venn diagrams, comparison matrices, posters
- **Artistic Expression:** song, dance, theater (ex. skits), 3-D models, dioramas, photo journal, stamp and coin designs, visual art, architecture/building or monument, museum design
- **Media design and creation:** podcast, historical markers, social media content, interactive virtual maps or tours, infographics, video, comic strips or graphics, game design, slideshows, digital scrapbook

Please view the [NPS Heritage cities lesson collection](#) for information and resources on other cities.

Single-Point Rubric

Areas for Improvement	Proficient (Meeting Standard)	Areas of Exceeding Standard
	Standard: _____ Evidence of meeting standard: •	
	Standard: _____ Evidence of meeting standard: •	
	Standard: _____ Evidence of meeting standard: •	
	Standard: _____ Evidence of meeting standard: •	
Points		

Figure 27: Single-Point Rubric (Standards; Blank) [Teacher selects priority standards for assessment.] Courtesy of Sarah Nestor Lane

Acknowledgment

The lesson series was written by Sarah Nestor Lane, an educator and consultant funded by a National Council on Public History's cooperative agreement with the National Park Service.