Oak Ridge, Tennessee, WWII Heritage City

A series of lessons from the World War II Heritage Cities Lesson Collection

Figure 1: Control desk in the master control room at K-25 at Oak Ridge (Credit: Department of Energy and Oak Ridge Public Library)

Introduction

The three lessons and culminating final lesson support the development of understanding the significance of Oak Ridge, Tennessee as an American World War II Heritage City. These lessons highlight the workers of Oak Ridge, with specific focus on contributions of women and African American workers, and the short- and long-term effects of the area having produced material for the atomic bombs dropped on Japan. Oak Ridge contributed to the home front development of uranium for the atomic bomb as part of The Manhattan Project. One lesson also details challenges faced by African Americans residing and working at Oak Ridge during the era of segregation and intense discrimination. These 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. Oak Ridge, TN: Innovation and Employment (p. 5)
    - Atomic bomb
    - Uranium
    - The Manhattan Project
    - Civilian workers
    - Women
    - African Americans
    - Science and innovation
2. Life in Oak Ridge, Tennessee for African Americans (p. 16)
    - African American workers
    - Discrimination
    - Wartime housing
3. The Atomic Bomb's aftereffects on Oak Ridge, Tennessee (p. 29)
    - The Manhattan Project
    - Atomic bomb
    - V-J Day (Victory over Japan Day) Day
    - Science and innovation
    - Post-War
4. Oak Ridge, Tennessee: Comparing and Connecting WWII Home Front Cities (p. 38)

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, African American history, Women's history

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

Note: This series of lessons may also have connections to your state's science standards due to its integration of information about the innovation and science behind the atomic bomb.

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

Lesson 1: Oak Ridge, TN: Innovation and Employment

About this Lesson

This lesson is part of a series teaching about the WWII home front. The subject is Oak Ridge, Tennessee, which is an American World War II Heritage City. The lesson contains photographs, background reading, and two primary sources to contribute to learners' understandings of the role of Oak Ridge during World War II, specifically its contribution to the Manhattan Project, and the workers there that contributed.

Objectives:

1. Understand the significance of Oak Ridge's role during World War II, specifically its contribution to the Manhattan Project and the production of enriched uranium.
2. Recognize challenges faced by workers at Oak Ridge, including women and African Americans, and their important contributions to the war effort.
3. Describe scientific innovation and engineering achievements, as shown by the achievements at Oak Ridge, in addressing global crises and shaping historical outcomes.

Materials for Students:

1. Photos: Figures 2-7 *(can be displayed digitally)*
2. Readings 1, 2, 3
3. *Recommended:* Map of the Oak Ridge, Tennessee area to plot locations
4. *Optional:* Extensions 1 & 2

Getting Started: Essential Question

How did the contributions of workers at Oak Ridge during World War II impact the success of the Manhattan Project and the outcome of the War?

Photos

Figure 2: One of the signs addressing Oak Ridge workers. (Credit: U.S. Department of Energy / Ed Wescott, via National Park Service)

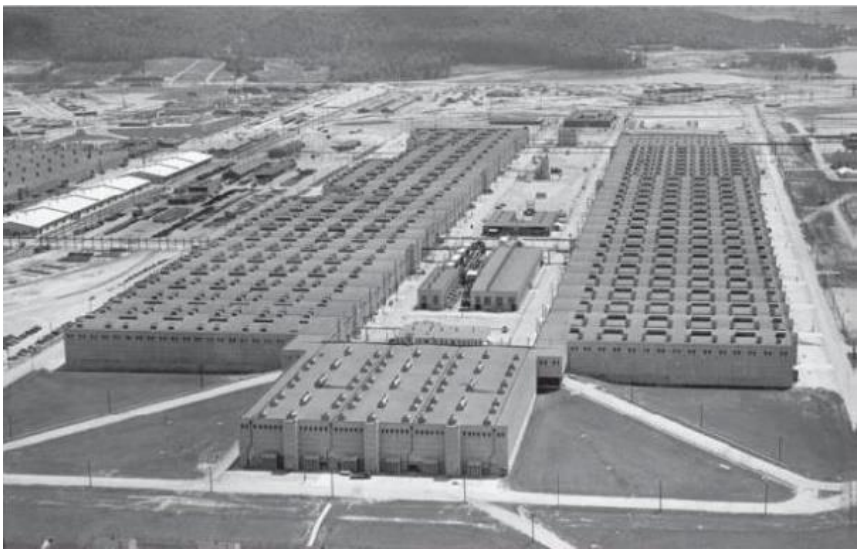

Figure 3: The K-25 gaseous diffusion plant was one of the largest buildings in the world at the time at about a mile-long, four stories, and was over 5,264,000 square feet (489,000 m2) of floor space. (Credit: U.S. Department of Energy)

By the numbers:

- Employment at Oak Ridge's height of operations was about 80,000 in summer 1945.
- Approximately 7,000 African American workers at Oak Ridge at peak employment in 1945.

Quotation to consider

"People would ask me… people who worked in the factory. What is that white powder? What is that yellow powder? What could you possibly be doing with it?… We weren't as cautious as we should have been. As far as breathing uranium dust and all."

- Herman I. Summerfield interview, Library of Congress

"There are no individuals who will take all the credit for this job, although certain key individuals deserve lasting credit. . .The girl washing dishes in the cafeteria and the man building roads all did their part, and perhaps they deserve more credit than the man who knew what he was doing. A real cross-section of America did this job."

- Colonel Kenneth D. Nichols (*The Knoxville Journal*; August 8, 1945)

Read to Connect

Reading 1: What was the role of Oak Ridge in World War II?

(Background Reading)

By Sarah Nestor Lane

Oak Ridge, Tennessee played a pivotal role in World War II, serving as a crucial site for the Manhattan Project, the top-secret research and development initiative that produced the atomic bomb. Oak Ridge emerged as a bustling city dedicated to the production of enriched uranium, a key component for the creation of nuclear weapons. Its contribution to the war effort was highly significant and an example of scientific and engineering achievements of the time.

Purpose of Oak Ridge

Prior to the war, Oak Ridge was a small rural community with a population of just a few thousand. Everything changed in 1942, when the United States government selected the

site to house three major facilities involved in uranium enrichment: the X-10 Graphite Reactor, the Y-12 electromagnetic separation plant, and the K-25 gaseous diffusion plant. These facilities were tasked with the enormous challenge of producing enough enriched uranium to fuel the atomic bomb.

The X-10 Graphite Reactor, located at Oak Ridge National Laboratory, was the world's first continuously operated nuclear reactor. It played a vital role in demonstrating the feasibility of producing plutonium, an alternative to enriched uranium. The Y-12 electromagnetic separation plant separated uranium isotopes by using powerful magnets. Its work was crucial in obtaining the highly enriched uranium needed for the bomb. The K-25 gaseous diffusion plant, one of the largest buildings in the world at the time (a mile long, four stories high, and over 5.2 million square feet of floor space), employed a complex method to separate uranium isotopes through a series of barriers, allowing for large-scale production.

Workers at Oak Ridge

The scale of operations at Oak Ridge was immense. By 1945, the site had grown to accommodate over 75,000 people, making it the fifth-largest city in Tennessee at the time. Its population was a mix of scientists, engineers, military personnel, and support staff. The city was kept strictly secret, with barbed wire fences and armed guards patrolling its boundaries. Workers lived in temporary and segregated housing, and recreational facilities were limited. Despite these challenges, the inhabitants of Oak Ridge worked tirelessly to meet the project's objectives.

The demand for workers was high, and many women joined the workforce, taking on various roles to support the production of enriched uranium. Many workers did not know the details of the project they were working on: an atomic bomb. They worked as scientists, technicians, clerks, and more. Their contributions were essential to the success of the project, and they proved women could excel in fields that were historically male dominated. One example was the "Calutron Girls," young women who operated the calutron machines at Oak Ridge during World War II. These machines were the ones used to separate isotopes of uranium to produce enriched uranium.

African Americans made valuable contributions to Oak Ridge despite the racial segregation prevalent at the time. Many African American workers were limited in their employment to construction, maintenance, and other support roles due to discrimination. They faced challenges such as segregated facilities and living arrangements and had limited opportunities for advancement or technical roles. Their dedication and hard work were crucial to the overall operation, and their contributions were instrumental in achieving the project's goals.

The Impact of Oak Ridge

The efforts at Oak Ridge culminated in the successful production of enriched uranium, which played a pivotal role in ending the war. The atomic bombs dropped on Hiroshima and Nagasaki in August 1945, with uranium-235 obtained from Oak Ridge, were devastating. They led to Japan's surrender and ultimately brought an end to World War II.

Today, Oak Ridge continues to be an important center for scientific research and development. The Oak Ridge National Laboratory remains an institution for scientific inquiry, with a focus on energy, materials, and national security. The city's role in World War II serves as a reminder of the feats that can be achieved when scientific innovation is harnessed for a specific purpose; however, it also leads to reflection of the war's harmful toll on human life.

Photos

Figure 4: Control room operators, mostly women, at Oak Ridge (Credit: Oak Ridge Public Library and Department of Energy)

Figure 5: Workers at Oak Ridge carrying coal (Credit; Department of Energy, Oak Ridge Public Library)

Reading 2: Worker Interview (Mary Boswell)

Teacher Tip: On August 4, 2018, Ms. Boswell recounted what she could remember, many years after working at Oak Ridge. Students should apply Reading 1 to this reading for greater understanding of the role of workers like Ms. Boswell at Oak Ridge.

For full interview: Boswell, Mary - COROH - ORPL Digital Collections (oclc.org)

MRS. BOSWELL: . . . I went to Knoxville with my friends because her (friend's) sister was giving us a free beauty course. So we went from there, after we left from Knoxville, we decided to go get an interview in Oak Ridge because we had some friends that were working in Oak Ridge. So, I went there in 1943.

MR. SMITH: Do you remember the month?

MRS. BOSWELL: No, I don't.

MR. SMITH: That's okay. Well, tell me about what your experience was when you got there.

MRS. BOSWELL: Well, of course, we took training a while. We went to classes and they didn't say, "Keep your mouth shut," because they knew that wouldn't do any good, but they did, when we were in our class, they did kind of give us a caution to be careful. From that,

why we got interviewed and I got a job. So, I started working at Tennessee Eastman as a cubicle operator. The cubicle operators didn't have a thing to do with the engineered part. What we did, the cubical operators was keep the stuff hot. You had to work on those cubicles all the time to keep it hot. Then we had to climb a ladder and they called it cleaning the slats. We had to go up and walk around that thing. So, that was my job. They called us the "Girls of Atomic City." That's what we did, but on the other hand, there were other parts of the place that I had no idea what was going on. I wasn't in the engineering department or anything like that. So we all had separate jobs. So that's just the way that worked out.

MR. SMITH: Do you remember what building you worked in?

MRS. BOSWELL: No, I don't.

MR. SMITH: What do you remember about that machine, where you had to walk up on the top and walk around it?

MRS. BOSWELL: Mm-hmm [affirmative].

MR. SMITH: What shape was it?

MRS. BOSWELL: It was round.

MR. SMITH: Okay.

MRS. BOSWELL: Inside the cubicles, we were working keeping that hot, and the upstairs, way up high, was where the stuff went, that kept getting hotter and hotter. So, that part is what was being hid in Y-12 at that time.

Questions for Reading 1 and 2, Photos 2-5

1. What was Oak Ridge's role during World War II?
2. What was the purpose of signs used in and outside of Oak Ridge, like in photo 1?
3. What roles and workers were needed for the development at Oak Ridge to be successful?
4. What challenges would workers face by being at Oak Ridge? Consider the challenges specifically for African American and women workers.
5. Based on Mrs. Boswell's descriptions in Reading 2, what do you think some of her responsibilities were at Oak Ridge? What type of building would she have worked at?

Photos

Figure 6: Display of Oak Ridge plant worker uniform and personal items at a history museum in Oak Ridge, Tennessee, at the former K-25 uranium-enrichment plant. (Credit: Photo by Carol Highsmith, Collection: Library of Congress)

Figure 7: Megan Lingerfelt's "Together, We Thrive" mural located in Oak Ridge, Tennessee today, photographed on 11/8/2021. (Credit: Photo by Carol Highsmith, Collection: Library of Congress)

Reading 3: Newspaper Excerpt

"10,000 More Workers are Needed Here" *(Excerpt)*

The Knoxville Journal (Knoxville, Tennessee) · Tue, Apr 18, 1944 · Page 1

Note: Oak Ridge is referred to as Clinton Engineer Works, or the Clinton Project. "4-F" is a classification in the U.S. Selective Service System that identifies a person as unfit for military service.

Area Director Robert L. Morrison, of the War Manpower Commission here, yesterday reported the Knoxville 48-hour minimum work week area was still in need of 10,000 more workers excluding the needs of the Clinton Engineer Works.

"The need is still tremendous," Morrison said, "we need about 20 per cent more men for our local industries alone. This does not take in the needs of the Clinton project."

"We are appealing to men in 4-F to go into war work. And it is the duty of every worker to fulfill the minimum 48-hour work week if it is humanly possible.

Some people don't seem to realize that the war is yet to be won. Many of us are spending a lot of time talking about postwar projects and are forgetting that this war is far from over."

Questions for Reading 3, Photos 6-7

1. What caused the immense need for workers in the area? Why did Director Morrison only refer to a need for more men and not men and women? What were his intentions?
2. What drew people to Oak Ridge? What else may have brought them to work there?
3. What details do you notice in the mural, "Together, We Thrive?" How do these details connect to your learning about Oak Ridge?
4. Would you add or revise any features of the mural? Why, or why not?

Lesson Closing

Answer the essential question: How did the contributions of workers at Oak Ridge during World War II impact the success of the Manhattan Project and the outcome of the War?

How do you think the employment at Oak Ridge, and other home front contributing employment, changed the working demographics of the U.S. over time?

Extension Activities

1) Employment at Oak Ridge today

Support your students' understandings with two more visual, multimedia resources:

- Oak Ridge National Labs circa 1945 (Standard Definition) - YouTube
    - This B-roll archival footage can be used in clips to show Oak Ridge in 1945. Compare what is seen in parts of this video to the next video (today's Oak Ridge).
- Oak Ridge Site 101 - YouTube (U.S. Department of Energy)
    - At about 1:26 you can view the landscape of the area. What area(s) seem familiar from the readings?
    - How do the number of employees and the Oak Ridge operations compare to the statistics of 1945? (See lessons *By the Numbers*)
    - You may also choose to explore their website: Oak Ridge | Department of Energy

2) Personal Stories of those who worked at Oak Ridge

Reading 2 highlighted an interview with one employee of Oak Ridge. There are many other interviews and personal narratives to explore. Break into small groups or partners and listen to another interview. Take notes and share out new details and connections from the individual's story.

Examples:

- Bill Wilcox [Source: Atomic Heritage Foundation, YouTube]
- Nina Ruth Steele Sherrill Collection | Library of Congress (loc.gov)
- Herman I. Summerfield Collection | Library of Congress (loc.gov)
- George Harvey Miles Collection | Library of Congress (loc.gov)

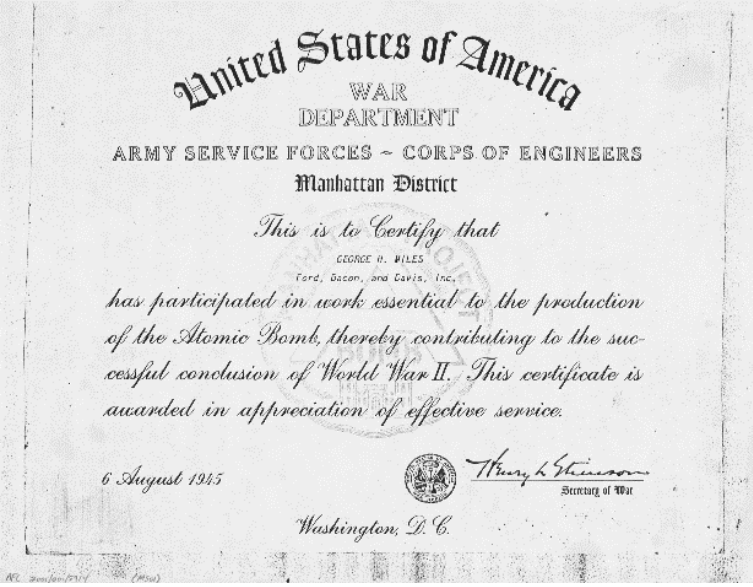
United States of America
WAR
DEPARTMENT
ARMY SERVICE FORCES ~ CORPS OF ENGINEERS
Manhattan District
This is to Certify that
GEORGE B. MILES
Ford, Bacon, and Davis, Inc.
has participated in work essential to the production of the Atomic Bomb, thereby contributing to the successful conclusion of World War II. This certificate is awarded in appreciation of effective service.
6 August 1945
Henry L. Stimson
Secretary of War
Washington, D. C.

Figure 8: Certificate for George Miles, certifying his contribution to the production of the atomic bomb (Credit: Library of Congress)

Additional Resources

The Calutron Girls (U.S. National Park Service) (nps.gov)

Manhattan Project Site Selection (U.S. National Park Service) (nps.gov)

Manhattan Project Science at Oak Ridge (U.S. National Park Service) (nps.gov)

Oak Ridge Secret Cities - Manhattan Project National Historical Park (U.S. National Park Service) (nps.gov)

Science Behind the Atom Bomb - Nuclear Museum (Atomic Heritage Foundation)

Symbols of Peace in the Secret Cities of the Manhattan Project (U.S. National Park Service) (nps.gov)

Victory Gardens at Oak Ridge (U.S. National Park Service) (nps.gov)

Lesson 2: Life in Oak Ridge, Tennessee for African Americans

About this Lesson

This lesson is part of a series teaching about the WWII home front, with Oak Ridge, Tennessee as an American WWII Heritage City. The lesson contains photographs, two primary sources, and a secondary source to contribute to learners' understandings of the contributions of African Americans at Oak Ridge, Tennessee, and the wrongful discrimination against those that lived and worked there. Many moved to the area for employment connected to the maintenance and operations of the facilities that contributed to the Manhattan Project. The Manhattan Project led to the creation and use of the atomic bomb in WWII.

Objectives:

1. Describe why people, particularly African Americans, would move to Oak Ridge, and the lifestyle and activities of those living there.
2. Identify examples of segregation and discrimination faced by African American Oak Ridge residents and workers.

Materials for Students:

1. Photos: Figures 8-15 *(can be displayed digitally)*
2. Readings 1, 2, 3
3. *Recommended:* Map of the Oak Ridge, Tennessee area to plot locations

Getting Started: Essential Question

How did African American workers contribute to the Manhattan Project at Oak Ridge, and what barriers did they face while residing there?

Photos

Figure 9: Women hanging laundry outside of hutments (Credit: Department of Energy (DOE); Oak Ridge Public Libraries (ORPL))

Figure 10: A row of hutments (Credit: DOE, ORPL)

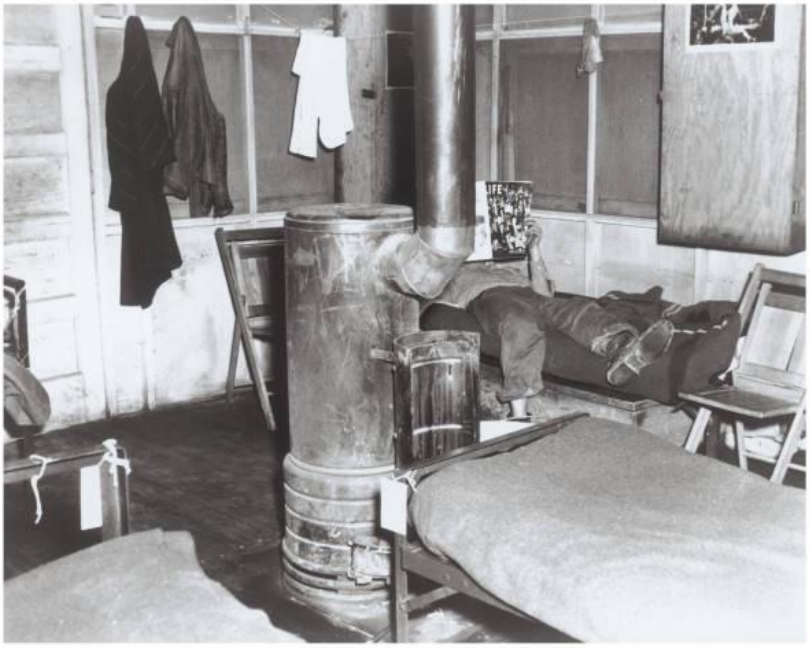

Figure 11: Inside of a hutment (Credit: DOE, ORPL)

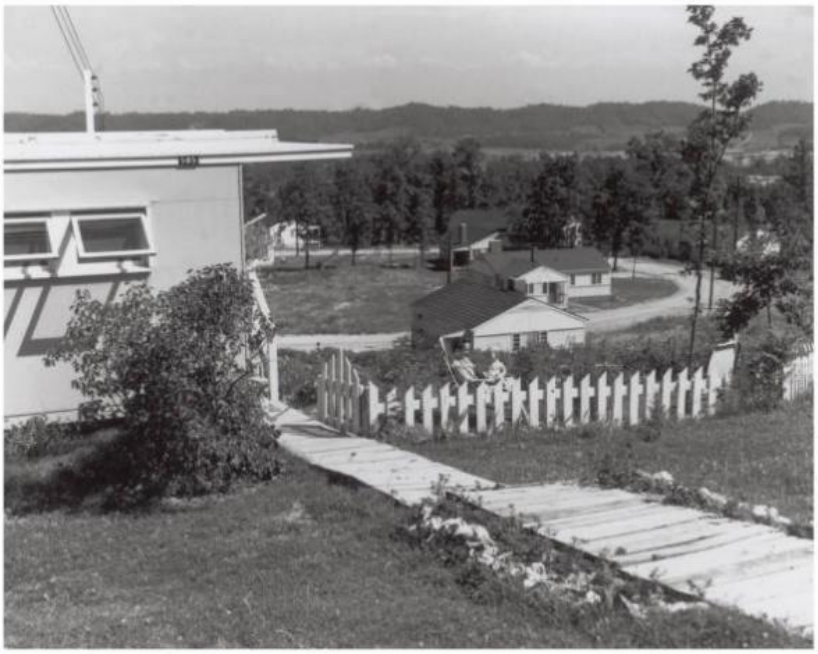

Figure 12 :A woman and child sitting in the yard of a flattop house (Credit: DOE)

Figure 13: Inside of a flattop house (Credit: DOE)

By the numbers:

- 30,000 people: the number originally expected for providing housing
- 75,000: Oak Ridge's population by war's end
- 2,000 African American workers (of 7,000 total) lived on-site

Quotation to consider

"If you were Black, even if you had a master's degree, it made no difference. All you could do was sweep up, clean up. In '43, that's all that you could do."

- Mrs. Ayers (Reading 2)

Read to Connect

Reading 1: Newspaper

Oak Ridge Is Locale of Best Kept Secret of War – Only 18 Miles of Knox

The Knoxville Journal, Tuesday, August 7, 1945

Teacher Tip: You will come back and focus on the detail of "8 percent hutments," and the lack of details surrounding this description when compared to the other living arrangements.

"During the past 36 months, one of the most remarkable cities in the world has come into being on a site where only oak and pine trees dotting small farms had been before.

In three years, the town of Oak Ridge, 18 miles west of Knoxville, has not only grown from nothing to the fifth largest city in Tennessee, with a population of nearly 75,000, but in the course of this time has managed to become one of the historic cities of America, a town that will ever remain associated with the greatest secret project of World War 2. . . .

. . . In July 1945, about 50 per cent of Oak Ridge's population lived in houses and apartments, about 21 per cent in dormitories, another 21 per cent in trailers and about eight per cent in hutments. The houses vary in size but are comfortable, roomy and homey. The Guest House, the town's pleasant two-story inn, frequently houses many of the world's most distinguished scientists and other persons of note, including Secretary of War Henry L. Stimson during and inspection visit last spring.

Cultural activities at the project began practically when the first residents moved into their new homes, on which rentals per month range from $22 to $75 for family houses, $10 to $15 monthly per person in dormitories, and $30 to $50 monthly on apartments. The cultural activity includes the Singing Society, the Oak Ridge community chorus, the Oak Ridge community band and string orchestra, the Oak Ridge symphony and the Music Society, which are sponsored by the Oak Ridge Recreation and Welfare Association. There is also the Oak Ridge Artists' Society and a Little Theater."

Reading 2: Interview with R.L. Ayers (Excerpts)

Teacher Tip: You may wish to break the interview into multiple parts that students share and report out on. The full interview can be accessed via Oak Ridge Public Library.

Arrival at Oak Ridge and Housing

MRS. AYERS: I came to Oak Ridge, October 1943. I was working at an Army camp in Grenada, Mississippi, near my hometown. This friend came by and said, "I heard of this place in Tennessee where you can make good money. Would you like to go?" I said, "Yes. Sure." She said, "Well, I'll get two tickets." And she did. We headed out to Tennessee. It was not Oak Ridge at that time. We came to Kingston, Tennessee. We crossed over on a little boat on over, it was called J.A. Jones at the time. So we came on to the Personnel there, which we were there all day long at the Personnel trying to get processed in. Then they took us to the hutments, where Black people lived. Black people and white people did not live in the same area. White people had barracks and dormitories, but Black people had huts to live in and that was it for the Black people. The huts were something like a box, made like a box. It had four beds in it. And if they needed more space they would put 8 beds in it, double beds. It had a big pot belly stove in the center of the floor and that was the heat. So we had no running water, no place to cook and no bathrooms in this place. They had a big long place they called it the latrine. That's where you had to go to do your washing, do your cooking if you wanted to cook anything, take a bath and use the bathroom.

MR. ALBRECHT: When you arrived and you saw where you would be living, did you suddenly have second thoughts?

MRS. AYERS: I didn't see where I was going to be living until I was bused there. No, I was too far from home then and broke at that. (Laughter) I didn't have any second thoughts. I thought, "Well, we'll make it." That's what I thought to myself that we will make it. So, they had only one building and we came to the K-25 area. They had one building then that was the K-25 building. Of course, you know they built more building, which were 33 and 1401 and all that. But there was only one building then and that was the K-25 building. We went to work at that building. If you were Black, even if you had a master's degree it made no difference. All you could do was sweep up, clean up. In '43, that's all that you could do. So, I wasn't making but $1.47 an hour, but it was better than where I came from. I worked at the K-25 building I guess maybe for a month. After I began to learn things, I went to the J.A. Jones. They owned the cafeteria. J.A. Jones was building that area down through there. That was the construction gang that was building down through there. So I went to work for J.A. Jones in the cafeteria and I didn't have to buy my food. That's why I went there. . . .

MR. ALBRECHT: Were you married when you came to Oak Ridge?

MRS. AYERS: No, I was not. But I hadn't been here very long before I got married. My husband came from Huntsville, Alabama. He was a concrete finisher here. He had worked with Hal Williams and the construction and all that because that was the only thing for Black males to do was construction and my husband worked in construction.

MR. ALBRECHT: You mentioned a few minutes a go about it didn't matter as a Black person, it didn't matter if you had a master's degree you were going to be sweeping the floor.

MRS. AYERS: That's right.

MR. ALBRECHT: Did you know of or did you meet any, or hear of any educated Black people that were here pushing brooms.

MRS. AYERS: As every Black person here. Every Black people here. No Black person held a high position or worked in an office or anything like that.

MR. ALBRECHT: Where there any of the Blacks that had college degrees that you know of?

MRS. AYERS: Yes, yes, it was.

MR. ALBRECHT: And they were pushing brooms.

MRS. AYERS: Yes, they were still a maid. You know, I have made the statement once that this place was owned and operated by the federal government and it was sad the way that the Black people were treated.

MR. ALBRECHT: Now at that time, at the time of the war, President Roosevelt signed executive order 8802 that said it was illegal to discriminate if you were a war time industry. And yet in Oak Ridge that was patently ignored. They said they would go along with the local customs instead. Was that widely known among the workers that there was that executive order and it was being ignored?

MRS. AYERS: Maybe some of them knew about it. But not everybody. People just didn't have time to talk with each other. Even if they did it wouldn't have done any good. . . .

MR. ALBRECHT: You had mentioned that you hadn't been here very long at all before you met and married your husband.

MRS. AYERS: Yes.

MR. ALBRECHT: Once you became man and wife, were you able to live together?

MRS. AYERS: No, we was not. They had, in these huts that I was talking about; they were inside what they would call a pen. They had all the women in one pen and the men were in another pen. They had board, five foot board around it with a strand of barbed wire at the top that you could not get in or get out. You had to come in by the guard. They had one way in and one way out. That was the men and the women. There was no family life for Black people here until the late, late '40's. That was just the life for Black people. That was the

reason that I said a while ago that it was awful the way that Black people were treated and it was in the federal government, all of it. . . . .

MR. ALBRECHT: You said that the white workers had different housing.

MRS. AYERS: Yes.

MR. ALBRECHT: Where were they housed?

MRS. AYERS: They was housed, oh, it was called Clinton Engineer. It was where Scarboro, old man Scarboro owned all that property in there. It was something like barracks for soldiers and of course they moved all the soldiers and everything out. That is where white people lived. They had running water; they had family lives, because a man could live with his wife there and the children. And they had white schools for white children. There was no Black children here, so there were no schools. It wasn't until '46 and '47 that they started letting Black children come here. So...

MRS. AYERS: I worked at the cafeteria the longest and when they finished this part over here which was called Clinton Engineer, they had a hospital over here. So, then I transferred to the hospital and went to the hospital to work. I worked there for 56 years at the hospital.

MR. ALBRECHT: Tell me a little bit about what your work was at the cafeteria, and then I want to hear about what you did at the hospital.

MRS. AYERS: Well, in the cafeteria, you just cleaned up after, it's just like working in a cafeteria, and you know a restaurant. You just clean up and washed dishes and stuff like that. Kept it clean. . .

MRS. AYERS: Well, I was always off into the medical departments, where ever I was, you know. That was really my field, was medical. And they were hiring everybody. It didn't make any difference who and where. They would hire you, whether it was sweeping a floor, whether it was cooking, or cleaning, or what. Any time that you could walk off of this job over to this job, they would hire you over there. You could get a job anywhere you say I want to work. So, I went to the hospital and I started working there as an aide. You know what an aide is? Helping patients. And I started to working there. I stayed there for 56 years. I worked in the emergency department and when the doctors took over the emergency room, I had too much seniority with the hospital to go under the doctors. So I went to surgery and I started working in the anesthesia department. That is where I retired from was anesthesia.

MR. ALBRECHT: I assume you got training along the way and constantly. . .

MRS. AYERS: Well, yes, I did get some training, but I did a lot of training myself. I did because I always had my ears open to everything. I worked with the doctors. I waited on them and I helped them. If there was anything I wanted to know, I would ask them. Of course, they would tell me whatever I asked them, they would tell me. I always had an exploring mind. I told you that. (Laughter)

MR. ALBRECHT: You alluded to it earlier, when you first decided to come from Mississippi up here to work. You said part of it was the lure of good money. What kind of money did you make throughout the war years? …

MR. ALBRECHT: Oh, my. I have heard some other folks being asked to and agreeing to giving a day of work for the bomb.

MRS. AYERS: Yes, everybody was asked to give one of the time and a half days, or a double time day, which if you worked a Saturday or Sunday, it was Saturday was a time and a half, Sunday would be double time. Everybody gave a day's work to the building of the atomic bomb.

Building of the Atomic Bomb

MR. ALBRECHT: Which brings up another question. This was during the time that the atomic bomb was being developed. This was a big secret. This was a secret city. Say nothing, ask nothing. How did people, how did they ask you to donate to the bomb if nobody knew they were building a bomb.

MRS. AYERS: Well, people knew that they were building a bomb. They knew that. Of course, you know the bomb wasn't built here. Only part of it. They had six plants in the United States where the bomb was built. Of course, It was assembled in California and then shipped on over to be dropped. People didn't know that and people really didn't care anything about that. But that's what happened.

MR. ALBRECHT: So it was, the bomb wasn't too big a secret. It was just a little bit of a secret, I guess.

MRS. AYERS: Well, it was a secret because they had like Hal said, "What you see here, what you hear here, you leave it here." You didn't talk about anything.

MR. ALBRECHT: What about while you were here? Did people talk; did people try to figure out what was going on?

MRS. AYERS: No, I don't think they really cared. I don't think so. Maybe they did care. There wasn't anybody to talk to about it. Who could you talk to? I couldn't talk to my neighbor because they didn't know anything about it, and didn't want to know anything about it.

MR. ALBRECHT: What typically were you told about the overall mission of the Manhattan Project and the Clinton Engineer Works? Or did anybody ever say, just do your job.

MRS. AYERS: Just do your job. That was it. Just do your job. . .

Questions for Reading 1 and 2, Photos 9-13

1. Describe the different housing conditions as seen in the photographs and described in the readings. Use details from both.
2. How does Reading 1's description (newspaper) of living compare to the interview description (reading 2)?
3. Mrs. Ayers (in Reading 2) blames the federal government for the discrimination faced by African Americans at Oak Ridge. Why is this? Do you agree with her reasoning? Why or why not?

Hint: In the interview, the interviewer says, "Now at that time, at the time of the war, President Roosevelt signed executive order 8802 that said it was illegal to discriminate if you were a war time industry. And yet in Oak Ridge that was patently ignored. They said they would go along with the local customs instead. Was that widely known among the workers that there was that executive order and it was being ignored?"

4. How does Mrs. Ayers describe working at Oak Ridge, and the knowledge, or lack thereof, of the atomic bomb? Did any details surprise you?

Photos

Figure 14: African American teens dance at segregated recreation hall (Credit: DOE, ORPL)

Figure 15: African Americans at one of the Oak Ridge houses of worship (Credit: DOE, NPS)

Reading 3: Excerpts from African Americans at Los Alamos and Oak Ridge: A Historic Context Study (nps.gov) (p. 39, 40)

Recreation

"A common complaint from African American residents living in Oak Ridge was the lack of recreational opportunities. Planned neighborhoods for white workers included community facilities such as pools, schools, and shops, but a comparable development for African Americans was never constructed. The small commercial area developed near the African American hutments included a cafeteria, a necessity considering the basic communal accommodations and lack of food preparation space in the hutments; however, its limited hours meant those who worked long hours or night shifts potentially missed meal periods. Without other places to eat, some African American workers faced the choice of sleeping during their off-hours and missing meal times or sacrificing sleep to eat during the cafeteria's limited open hours. Other facilities in the hutment area included a recreation center, a one-chair beauty shop, a barber shop, the Atomic Club—a juke joint that served fried chicken—and an administrative office, which employed white secretarial staff to oversee African American workers.

The bare-bones recreation center located in the African American hutment area took the place of the theaters, gymnasiums, and community buildings constructed in white neighborhoods. The recreation center became the location of weekly showings of dated "race" films—films with all-black casts produced for black audiences—card games, weekend dances, and church services. . .

Baseball

One of the few organized recreational opportunities available to African American men at Oak Ridge was baseball. An August 10, 1944 Oak Ridge Journal article mentioned the creation of a new African American baseball league that would be playing on the "colored ball diamond" located near the hutment area and the K-25 diamond. At the time, the five teams were named for the contractors that employed the players: Roane-Anderson; Stone and Webster; J.A. Jones; Ford, Bacon, and Davis; and Keith Williams and Carbide and Carbon.140 This entirely African American league could have been the genesis of the "Oak Ridge Bombers," a semi-pro team that was created and managed by Robert Lee as early as 1944. Lee organized African American men who were excluded from playing on white teams but wanted to travel and compete against other black men who were excluded from professional teams. There is no mention of the African American Oak Ridge plant teams after 1945, but the Oak Ridge Bombers, which was primarily made up of workers from the Oak Ridge facilities, continued to play into the 1960s, well after Jackie Robinson integrated professional baseball in 1947."

Questions for Reading 3, Photos 14-15

1. How does the reading compare the African American community facilities to those provided to white residents?
2. What was a difficulty faced by residents with unique working hours?
3. Who were the "Oak Ridge Bombers?"
4. Why is baseball a historically significant activity to note for recreation opportunities at Oak Ridge (for African American residents)?

Extensions

Video

Support your students' understandings with another resource.

Oak Ridge's segregated and oppressed history not forgotten - YouTube

- What are the strengths of the video?
- What could be added or revised to strengthen it?

Teacher tip: The Manhattan Project included more than one site. You may wish to research with students how the site location did, or did not, impact discrimination and/or segregation. You may also wish to research African American scientists that worked on the Manhattan Project.

Additional Resources

African American Experiences at Oak Ridge:

- African American Houses of Worship (U.S. National Park Service) (nps.gov)
- African Americans at Los Alamos and Oak Ridge: A Historic Context Study (nps.gov)
- African Americans and the Manhattan Project - Nuclear Museum
- Flattop houses (to compare, as hutments are no longer standing): Oak Ridge Alphabet Housing (U.S. National Park Service) (nps.gov)
- Series: Curiosity Kit: African American Baseball (nps.gov)

Lesson 3: The Atomic Bomb's After Effects on Oak Ridge, Tennessee

About this Lesson

This lesson is part of a series teaching about the WWII home front, with Oak Ridge, Tennessee as a WWII Heritage City. The lesson contains photographs, three primary sources, and two optional extensions to contribute to learners' understandings of the contributions of Oak Ridge to the creation of the atomic bombs with the Manhattan Project, and its short- and long-term impacts on the community.

Objectives:

1. Describe the contributions of Oak Ridge to the Manhattan Project and the development of the atomic bombs.
2. Analyze local citizens' connections to, and opinions of, the role of Oak Ridge in developing the atomic bombs.
3. Compare the short- and long-term impacts of the atomic bomb production on the city of Oak Ridge.

Materials for Students:

1. Photos: Figures 16-19 *(can be displayed digitally)*
2. Readings 1, 2, 3
3. *Recommended:* Map of the Oak Ridge, Tennessee area to plot locations
4. *Optional:* Extensions 1 & 2: devices for students to explore digital resources

Getting Started: Essential Question

How did the dropping of the atomic bombs impact Oak Ridge, both immediately, and in the future?

Photos

The Knoxville News-Sentinel

Served by United Press, Scripps-Howard Alliance, Chicago Daily News Foreign Service, NEA Service, Acme Telephoto and Newspictures, Associated Press Daily.

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Oak Ridge Has Over 425 Buildings

ATOMIC SUPER-BOMB, MADE AT OAK RIDGE, STRIKES JAPAN

By CHUET COLEMAN

WASHINGTON, Aug. 6—The United States has unleashed against Japan the terror of an atomic bomb 2000 times more powerful than the biggest blockbusters ever used in warfare.

President Truman revealed this great scientific achievement today and warned the Japanese that they now face "a rain of ruin from the air the like of which has never been seen on this earth."

More and more of these devastating bombs, unlocking the vast hidden energy that lies within the atom, will tumble on Japan if they continue to reject the Potsdam surrender ultimatum.

The new atomic bomb was used for the first time yesterday. An American plane dropped one on the Japanese army base at Hiroshima.

Its use marked victory for the Allies in the greatest scientific role in history. We put $2,000,000,000 and the work of 125,000 persons into the project.

A single bomb has more power than 20,000 tons of TNT. It has more than 2000 times the blast power of the British "grand slams" veteran bomb, the largest ever used previously in the history of warfare.

Secretary of War Henry L. Stimson disclosed that an improved bomb would be forthcoming shortly that would increase by several-fold the present effectiveness of the new weapon.

Thick Cloud Obscures Target Area

The War Department said it was not yet able to make an accurate report of the damage caused by the first bomb.

"Reconnaissance planes state that an impenetrable cloud of dust and smoke covered the target area," an announcement said. "As soon as accurate details of the result of the bombing become available, they will be released by the secretary of War."

Development of the bomb, a victory of American scientists in a desperate race with Germany, is "the greatest achievement of organized science in history," Mr. Truman said in a statement released at the White House.

The United States, he added, is now prepared "to obliterate more rapidly and completely every productive enterprise the Japanese have above ground in any city.

Japan Warned in Potsdam Ultimatum

He revealed that the July 26 ultimatum issued to Japan

Mr. Truman said that Secretary of War Henry L. Stimson, who has kept in personal touch with the atomic developments, would make public further details. Stimson's statement, the President said, will give "facts" concerning the atomic production centers at Oak Ridge, near Knoxville, Tenn.; at Richland, near Pasco, Wash.; and near Santa Fe, N. M.

was made "to spare the Japanese people from utter destruction."

When the ultimatum was rejected, the atomic bomb was sent into action.

"If they (the Japanese leaders) do not now accept our terms, they may expect a rain of ruin from the air, the like of which has never been seen on this earth," he said.

Mr. Truman revealed that "two great plants and many lesser works" employing more than 65,000 workers are producing the new atomic bomb. Even more destructive bombs are being developed, he said.

Oak Ridge One of Three Centers

Production centers are located at Oak Ridge, near Knoxville, Tenn.; at Richland, near Pasco, Wash.; and near Santa Fe, N. M.

Mr. Truman's statement, released while he still was en route home by cruiser from Potsdam, lifted the secrecy from one of the most closely-guarded enterprises of the war. No mention of atomic power or any possible use of it in warfare has been allowed under the newspaper and radio code of the Office of Censorship.

Mr. Truman did not reveal the effects of the first bomb used against Japan. He said, however, that despite the vast multiplied potency of the bomb, "the physical size of the charge is exceedingly small."

"It is an atomic bomb," he said. "It is a harnessing of the basic power of the universe."

"The force from which the sun draws its power has been loosed against those who brought war to the Far East."

Uranium Ore Used for Bombs

Stimson revealed that uranium is the essential ore in the production of the bombs. He added that steps have

(See full page of Oak Ridge pictures on Page 17, and further details on Pages 2 and 18.)

been taken and will continue to be taken to insure adequate supplies of this mineral."

(Uranium is a "radioactive" chemical element. It belongs to the same family as radium. In radioactive elements the atoms slowly disintegrate by radiating energy, and in course of centuries one element is transferred into another.)

Stimson said "We are convinced that Japan will not be in a position to use an atomic bomb in this war."

"It is abundantly clear that the possession of this weapon by the United States, even in its present form, should prove a tremendous aid in the shortening of the war against Japan," Stimson said.

Stimson praised highly the scientists who had developed this atomic power.

"Behind these concrete achievements lie the tremendous contributions of American science," he declared. "No praise is too great for the unstinting efforts, brilliant achievements and complete devotion to the national interest of the scientists of this country. Nowhere else in the world has science performed so successfully in time of war."

The first atomic bomb presumably was dropped from a

Story of Secret Officially Told

Even Plant Chiefs Didn't Know What Work Others Did

Two Views of Giant Oak Ridge Production Plant

Figure 16: Front page of the newspaper, with headline reading, "Atomic Super-Bomb, Made at Oak Ridge, Strikes Japan," from the Knoxville News-Sentinel (Credit: NPS)

Figure 17: People enter and leave a theater, showing "The beginning or the end" Story of the Atomic Bomb and Oak Ridge. (Credit: Department of Energy)

By the numbers:

- By April 1945, 25 kilograms of bomb-grade uranium had been produced at Oak Ridge and by mid-July 1945, about 50 kilograms
- By July 1945, the Y-12 facility at Oak Ridge had consumed about 1.6 billion kilowatt-hours of electricity, which was 100 times the energy produced by the atomic bomb "Little Boy," the bomb dropped on Hiroshima
- 2 atomic bombs dropped on Japan, both using materials produced at Oak Ridge
- 14,000 people let go in layoffs from Oak Ridge in summer to October 1945

Quotation to consider

"I was a good, loyal American. I have a good feeling for having contributed to the war effort. It was tragic that we had to have that big of a war, but it had to be."

- Herman I. Summerfield, worker from Oak Ridge *(He had finished college with a degree in Chemical Engineering prior to arriving at Oak Ridge. Full interview here.)*

Read to Connect

Reading 1: Interview Excerpt (Ms. Mary Alexander)

Teacher Tip: The full interview is catalogued with the Oak Ridge Public Library. Ms. Alexander lived at Oak Ridge as a child; her father worked there.

MR. HUNNICUTT: Do you remember in 1945 when they announced about dropping the bomb on Japan? Do you remember that event?

MS. ALEXANDER: Yes and no. We moved right after that to Oak Ridge. I was still living in Madisonville. I had friends whose parents went to the war and we had a neighbor boy that was killed. We had another one that lost both legs. So I was well aware of the war. And that's the reason I think my dad got 1-A. I was scared. I was really frightened.

So when we got the word all we knew was Dad worked and of course, you had nothing to get visually that showed you what devastation was there. And Hiroshima and Nagasaki, you just knew that bomb was over there and the war was over. When the war was over, I

remember our street just celebrated. The kids ran up and down the street and said, “The war is over, the war is over!” I remember that very well.

But I don't know that I really realized the impact that Oak Ridge had on the war. Because you just didn't have all that information. Now, as time went on, you begin to know and be aware of what contribution Oak Ridge had. I think things when I began to appreciate that.

Reading 2: Newspaper Article (Excerpt)

Teacher tip: The bolded text is originally bolded in the newspaper. Explain the importance of bolded sentences as an author’s choice in historically long newspapers.

Newsman From All Over U.S. Besiege Oak Ridge for Stories on Atomic Bomb *(excerpt)*

The Knoxville News-Sentinel (Knoxville, Tennessee), August 8, 1945, p.12

Want Stories and Pictures

And thus it goes. The press, magazines, and newsreel people want stories and pictures. They already have come from all over the country and more are coming.

Oak Ridge gates are not open to all comers, however, and armed Military Police still guard the gates. When a reporter arrives he is given military escort to the Press Headquarters building on Oak Ridge Turnpike.

There, Lt. Robinson, in civilian clothes, issues identification passes and off goes the reporter with an Army officer as guide. But, the newsman is restricted to the residential and business sites. He must not, and cannot approach the industrial plant sites where the atomic bomb elements are produced. This secret is kept from prying eyes.

Not Open to Sight-Seers

Oak Ridge is not open to sight-seeing visitors. Not even the townsites. Residents here may invite their guests and relatives, but they must have passes waiting on them at the many gates.

Soon after President Truman revealed the atomic bomb had been dropped on Japan – obliterating mile after mile of Hiroshima, reporters threw an extra shirt in a traveling bag and came to Oak Ridge.

At Col. Kenneth D. Nichols' first press conference there were some 30 disseminators of news on hand. They came from New York, Washington, Philadelphia, St. Louis, Memphis, Nashville, Asheville, Atlanta and elsewhere. …

These newsmen knew the atomic bomb was the biggest news story of the century. Newspaper extras in Oak Ridge were far in excess of the German surrender or the Normandy invasion of Europe. And more were sold, with many still complaining there weren't enough to go around.

Newsmen Seek New Angles

Grasping the meaning of this spectacle, visiting newsmen knew their papers at home were going just as rapidly to a news-hungry America. They still are searching every nook and corner for new angles—new stories on the most destructive force on earth.

Newsmen are housed in either Casper Hall or Oak Ridge Guest House as guests of Oak Ridge officials. They take their meals wherever they can catch them, at one of the many cafeterias or restaurants.

And more are coming. Oak Ridge has catapulted from a hidden city in East Tennessee's hills to the most publicized place on earth.

Questions for Reading 1 and 2, Photos 16-17

1. Describe Ms. Alexander's perspective as a child in Reading 1. How do you think her perspective has changed over time?
    a. Why may she have added, "*you had nothing to get visually that showed you what devastation was there*," when referring to the bombing sites in Japan?
2. In Reading 2, the role of the press and media is described. If you were a reporter at the time, what would you ask? What would you try to document?
3. In Photo 2, the movie / news reel being shown was titled "The Beginning or the End." Considering what you have read, why do you think the news of the atomic bomb and connections to Oak Ridge would be titled this?

Photos

Figure 18: Crowd at Jackson Square, celebrating, on V-J Day. (Credit: Department of Energy)

Figure 19: Jackson Square today, marked with a National Park Service historical marker (Credit: NPS)

Reading 3: Editorial in Newspaper

Teacher Tip: Support students in this understanding: The term "Jap" is a derogatory slur that was used to build anti-sentiment toward the Japanese. It is offensive and should not be used today.

Oak Ridge Development As 'Atomic Capital of World' Anticipated

From the Editorial Page of *The Knoxville Journal* (Knoxville, Tennessee), August 10, 1945, p.6

It will occur to a good many Oak Ridgers that, now their city has become Atomic Capital of the World, they have more or less worked themselves out of jobs. That is to say, the actual production of the new bomb in its effective form has definitely shortened the Jap war and thus lessened the time in which atom-cracking, for war purposes, will be necessary.

It immediately becomes apparent, however, when one looks at the whole picture that Oak Ridge and its people almost certainly have ahead of them peacetime objectives, and jobs, of even more far-reaching importance than the one they have just brought to such an astounding conclusion. The development of atomic processes to bless, rather than obliterate, mankind must now become one of the prime objectives of science and industry.

If such a forecast is reasonable, then it follows that Oak Ridge, having been released from the cocoon of secrecy which has surrounded it for sound military reasons all these months, will now begin to take on additional lines of development as an independent and growing city. This is a natural process and one which will add immeasurably to the satisfaction of Oak Ridge residents, many of whom have been humanly irked, from time to time, by the feeling that their community was considered a sort of suburb of Knoxville.

It seems to us that this development adds definitely to the logic of a piece which appeared here several weeks ago in anticipation of the close of the war. At that time The Knoxville Journal, pointing out the possibilities for development in this territory, urged that war workers, who might be displaced from their present positions by the ending of the war, should undertake to relocate permanently in this area. In extending this invitation on behalf of East Tennessee, we also suggested that the 'natives' would be glad to assist in this process in any way they could.

We should like to renew and reemphasize this invitation in view of the imminent ending of the war, and also to call attention to the fact that our invitation has been endorsed by a large number of local civic organizations and other groups.

We close on the note that if, perhaps, there are some things about East Tennessee that some of our newcomers don't like, then take this as an invitation repeated to stay with us and help change them.

Questions for Reading 3, Photos 18-19

1. Photo 3 shows celebration at Oak Ridge on Victory over Japan Day, or "V-J Day," when Japan surrendered. Why is this photo significant to Oak Ridge's history?
2. Why does reading 3 call Oak Ridge the "Atomic Capital of the World?"
3. Connect Reading 2's descriptions to Reading 3's phrase, "released from the cocoon of secrecy."
4. Why would the writer from reading 3 be inviting residents of Oak Ridge to stay in the area?
5. Using all resources from the lesson, answer the essential question: How did the dropping of the atomic bombs impact Oak Ridge, both immediately, and in the future?

Complete Extension 2 to learn about Oak Ridge and its residents today.

Extension Activities

1) Ed Westcott: Oak Ridge Photographer

Support your students' understandings with more visual and multimedia resources.

Ed Wescott was the Oak Ridge photographer that produced many of the images used throughout the (H)our History lessons on Oak Ridge.

Explore more photos by Ed Westcott and of Oak Ridge. Pick one or more to share with others. Consider its importance and the details that make it interesting.

a. Department of Energy Photograph Collection - ORPL Digital Collections (oclc.org)
b. Ed Westcott - Explore Oak Ridge

To learn more about the photographer Ed Westcott, you may choose to share this video with students: "Ed Westcott – Photographer." (This video is runs at 14:52, but can be broken into parts or share a highlight.)

2) The City of Oak Ridge today…

In Reading 3, the writer urged Oak Ridge residents to consider staying in the area.

a. Make a prediction: What do you think the area of Oak Ridge looks like today? Do you think people stayed, and/or developed it as more of a city? Why, or why not?
    - Investigate the City of Oak Ridge's website. What surprises you? Do you think the writers from 1945 would be surprised today?
b. Use the site to find mentions, or details, of the origin of the city. What connections do you make to the primary sources?
c. Read about the International Friendship Bell in Oak Ridge. Why do you think the Friendship Bell is important to the city's identity today?

Additional Resources

From Treasury Vault to the Manhattan Project | American Scientist

Oak Ridge, TN – Nuclear Museum (The Atomic Heritage Foundation)

The Atomic City: Why Oak Ridge Was Chosen for the Manhattan Project - Explore Oak Ridge (The City of Oak Ridge)

Jackson Square, Oak Ridge (National Park Service)

Lesson 4: Oak Ridge, Tennessee: Comparing and Connecting World War II Home Front Cities

About this Lesson

This lesson is part of a series teaching about the World War II home front. Oak Ridge, Tennessee is an American WWII Heritage City. The lesson contains photographs, reading, and a primary source, 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 WWII location(s) in Oak Ridge, Tennessee and describe its historical significance
b. Summarize the contributions of Oak Ridge, Tennessee civilians to home front wartime efforts and challenges overcome to make these contributions
c. Evaluate the short- and long-term impacts of the contributions of Oak Ridge and The Manhattan Project
d. *Optional:* Describe similarities and differences of Oak Ridge, Tennessee and other WWII Heritage city(s) / home fronts.

Materials for Students:

1. Photos: Figures 20-23 *(can be displayed digitally)*
2. Readings 1-3
3. Maps, project materials (as needed)
4. Student graphic organizers (See Figure 24 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 WWII location(s) in Oak Ridge, Tennessee and describe its historical significance
    b. **Objective**: Summarize the contributions of Oak Ridge, Tennessee civilians to home front wartime efforts and challenges overcome to make these contributions
    c. **Objective**: Evaluate the short- and long-term impacts of the contributions of Oak Ridge and The Manhattan Project
    d. **Objective** *(optional)***:** Describe similarities and differences of Oak Ridge, Tennessee and other WWII Heritage city(s) / home fronts.

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 Oak Ridge, Tennessee chosen as an American World War II Heritage City, and what are its similarities and differences to other home front cities?

Photos

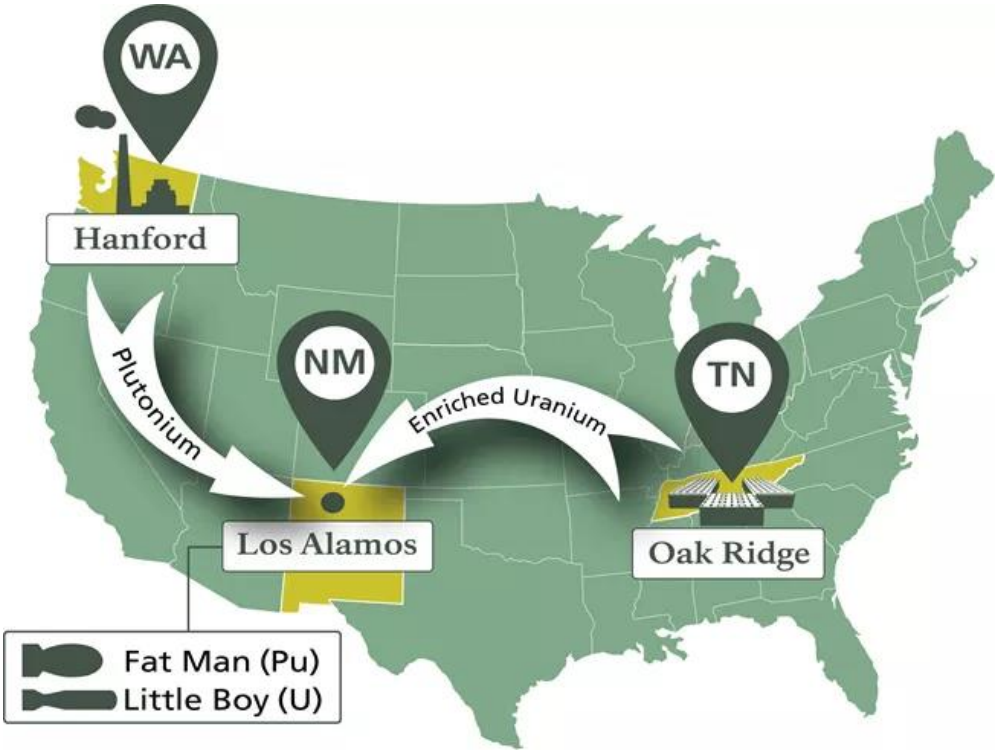

Figure 20: A map showing the locations of The Manhattan Project and the flow of plutonium from Hanford, and uranium from Oak Ridge to Los Alamos to create the atomic bombs. (Credit: National Park Service)

Figure 21: General Groves, also the speaker in the "Quotation to Remember," speaking to a group of service members at Oak Ridge (Credit: Oak Ridge Public Library; Department of Energy)

Figure 22: Display of atomic bomb model at the former K-25 uranium-enrichment plant, now a history museum, in Oak Ridge (Credit: Photo by Carol Highsmith, Library of Congress Collection)

Quotation to consider:

"Oak Ridge will have a unique place in history. It will be a landmark in the field of atomic development."

- General Leslie R. Groves, USA, Commanding General (Manhattan Project, 1942-1947)

Reading 1: The Manhattan Project and Oak Ridge (Overview)

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 this 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.

Scientists used two materials: plutonium and uranium. Plutonium is a heavy metal that can release a lot of energy when its atoms split apart. Uranium is a type of metal that can also release energy when its atoms are split. Scientists combined these 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. Plutonium, or uranium, was put in a bomb to create the atomic bombs used at the end of the war.

Oak Ridge made important contributions to the Manhattan Project during World War II. Located in Tennessee, Oak Ridge played a crucial role in developing and producing enriched uranium for the atomic bomb. Scientists and workers at Oak Ridge worked to refine and purify uranium through a process called gaseous diffusion. This helped create the necessary fuel for the bomb's powerful chain reaction. The work done at Oak Ridge was top secret and greatly aided in the success of the Manhattan Project. Workers often did not know the overall project they were contributing to.

The Manhattan Project National Historical Park is three sites: Los Alamos (New Mexico), Hanford (Washington), and Oak Ridge (Tennessee). Each had its own part in developing the atomic bombs.

Reading 2: 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 1 and 2, Photos 20-22

1. What was The Manhattan Project and Oak Ridge's role in this project?
2. What was the purpose of the bill (H.R. 6118) according to the report?
3. Why do you think Oak Ridge, Tennessee, was designated as a World War II Heritage City? Use details from the bill and from prior lessons.
4. Are there other cities you think of when considering home front contributions during wartime? Which, and why?

Photo

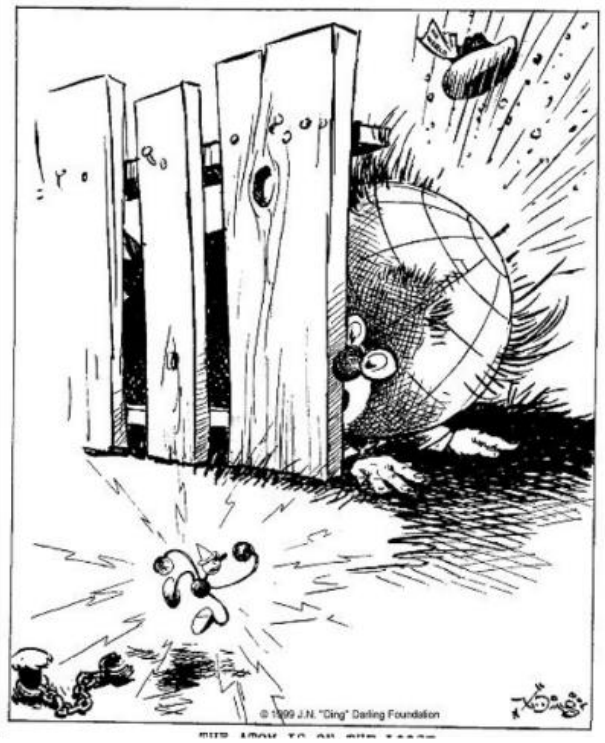

Figure 23: "The atom is on the loose," an editorial drawing released on August 8, 1945 by Jay N. Darling (Credit: The University of Iowa Libraries)

Reading 3: Newspaper Excerpt from *The Knoxville Journal*

August 8, 1945

"Bomb Cheapest Way to Beat Nips" ("Nips" is a term that was used to derogatorily label the Japanese. It is inappropriate and discriminatory to use this term.)

Despite the $1,600,000,000 initial outlay that went into plants at Oak Ridge and elsewhere, the Atomic Bomb is "far cheaper than any other way of bombing Japan," Col. Kenneth D. Nichols, district engineer of the Manhattan Engineer of the Manhattan Engineer District in charge of the Oak Ridge Project said yesterday.

The Army officer, who yesterday conducted the first press conference ever held on the recently "blacked-out" project, explained this mathematical conclusion in this way:

"The atomic bomb is estimated to have the explosive power of 20,000 tons of TNT. It would probably take 2000 bombers to carry that much TNT to the target.

"But the atomic bomb delivered the blow with the help of just one airplane."

"And there are more coming," he added.

Another beauty of the atomic bomb discovery is that the manpower involved in production is kept well behind the lines, he added. . .

He was warm in his praise of what he called "the greatest accomplishment we have ever had in the history of this country so far as teamwork is concerned."

"There are no individuals who will take all the credit for this job, although certain key individuals deserve lasting credit," he declared.

"The girl washing dishes in the cafeteria and the man building roads all did their part, and perhaps they deserve more credit than the man who knew what he was doing.

"A real cross-section of America did this job," He concluded.

Questions for Reading 3, Photo 23

1. Today, the $1,600,000,000 in 1945 is roughly equivalent to $2,696,560,000 today, or $8 per person in the United States. Do you think the investment from the U.S. government into Oak Ridge and The Manhattan Project was successful? Why, or why not?
2. Col. Nichols describes the teamwork of those at Oak Ridge. How did the various contributions of home front workers at Oak Ridge contribute to the U.S. war efforts?

3. How would you remember and honor the contributions of workers from Oak Ridge today?

Culminating Activity/Mastery Product

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

a. Identify important WWII location(s) in Oak Ridge, Tennessee and describe its historical significance.
b. Summarize the contributions of Oak Ridge, Tennessee civilians to home front wartime efforts and challenges overcome to make these contributions.
c. Evaluate the short- and long-term impacts of the contributions of Oak Ridge and The Manhattan Project.
d. *Optional:* Describe similarities and differences of Oak Ridge, Tennessee and other WWII Heritage city(s) / home fronts.

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 Oak Ridge 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 24: Single-Point Rubric (Standards; Blank) [Teacher selects priority standards for assessment.] Courtesy of Sarah Nestor Lane

Acknowledgment

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