



BOXED-IN SCRIPT: ACTIVITY AND ASSESSMENT

Total Lesson Time: 60 minutes

Total Lesson Time with Extensions: 90 minutes

Lesson Introduction and Conclusion: 5 minutes

Activity 1 Hanford Made Video- 15 minutes

Activity 2: Boxed-In Caption Worksheet- 30 minutes

Assessment: Photo Identification Worksheet- 10 minutes

Extension 1: Discussion- 20 minutes

Extension 2: Boxed-In: By the Numbers Worksheet- 10 minutes

TIME, ACTIVITY, ACTION	SCRIPT
<p>2 MINUTES</p> <p>LESSON INTRODUCTION</p> <p>Split students into pairs.</p> <p>Give students one minute to find partner.</p> <p>Handout caption worksheet and materials for drawing.</p>	<p>For today's lesson you we will be learning about the Manhattan Project which was a top-secret military project to create the world's first atomic bombs.</p> <p>Set rules.</p> <p>You will be working in pairs so please take one minute to find your partner.</p> <p>Each of you should have a pencil and a caption worksheet, and whatever materials you would like to use for drawing.</p> <p>We will begin today's lesson by completing the first box of our caption worksheet. Then we will watch the Hanford Made video. After the video we will finish the caption worksheet and you complete a second worksheet in order to see what you have learned today.</p> <p>(If facilitating Extension 1 or Extension 2- let students know what to expect).</p>
<p>5 MINUTES</p> <p>EXTENSION 1: VOTE WITH YOUR FEET, SCIENTISTS DISCUSSION</p> <p><i>While students have their eyes closed place male scientist, female scientist, and scientist signs around the classroom.</i></p>	<p><i>Now we are going to have a short discussion but first I want you to picture a scientist in your head. Is the scientist short or tall? Is their hair long or short? What kind of clothes do they wear?</i></p> <p><i>Everyone now please stand-up. If you imagined a male scientist walk and stand at the spot that says male scientist. If you thought of a female scientist stand at the female scientist station. (Optional third sex identity: If you drew a drawing of a non-binary person move to station three – scientist.)</i></p> <p><i>(Count how many people in each section. Students should raise their hand to answer.)</i></p>

	<p>- We had _____ many people vote for female scientist. _____ of the class voted for male scientist.</p> <p>- What can you take away or learn from what we just did? Raise your hand if you would like to answer. (Optional third sex option: We had _____ people vote for non-binary scientist).</p> <p>- If we did this same activity back during WWII would we have the same number of female scientists?</p> <p>- (Optional: What about a third non-binary category?)</p> <p>- Let's now learn about how the women of Hanford contributed of the Manhattan Project.</p>
<p>10 MINUTES</p> <p>EXTENSION 2: STATISTICS</p> <p>Hand out worksheet.</p>	<p>- Now we are going to look at some statistics from the Census Bureau. You will complete this worksheet independently and may not work with your partner. You will turn your worksheet in to be graded at the end of class.</p>
<p>5 MINUTES</p> <p>CAPTION WORKSHEET: INTRODUCTION AND BOX 1</p> <p>Show page 1 of caption worksheet to students.</p>	<p>- You each have a Caption Worksheet with four boxes on the front and four boxes on the back. You will draw a picture in each of the blank boxes. You can use color if you would like but you don't have to. Beside each box is a box with lines. After you draw your picture you will use these lines to write a caption for your drawing. A caption is a short description of your picture. Please write full sentences for your captions.</p> <p>- Before we watch the video, you will first draw what you know about World War II and the Manhattan Project in the first box of your caption worksheet. After you are finished drawing and captioning, share your work with your partner and discuss what you drew. Does anyone have a question?</p> <p>-Check in with your partner to make sure they understand the assignment. (Give students 5 minutes)</p>
<p>15 MINUTES</p> <p>HANFORD MADE VIDEO</p> <p>Play Hanford Made video</p>	<p>- Now we are going to watch the Hanford Made video. This is a fifteen minute video about the Manhattan Project.</p>

<p>3 MINUTES</p> <p>BOX 2: HANFORD MADE VIDEO</p> <p>Students will draw and caption each box. Students should be listening, drawing, and captioning. Students may work quietly with their partner.</p>	<ul style="list-style-type: none"> - Does anyone have any questions, comments, or concerns about the Hanford Made video? - For BOX 2, draw something you learned from the Hanford Made video. Once you are finished drawing, caption your box, and share your work with your partner. Remember, a caption is a short description. You have three minutes to draw and caption your picture.
<p>5 MINTUES</p> <p>BOX 3: BACKGROUND</p>	<ul style="list-style-type: none"> - For this part of the activity you are going to listen to each paragraph that I read, and while I am reading, you will draw a picture in the box that reminds you of what I read, and create a caption to go with it. You have five minutes to draw and caption your picture. Does anyone have any questions? Take a moment to make sure your partner knows what we are doing. - Women have always worked outside the home but never in the numbers or with the same impact as they did in World War II. Prior to the war, most of the women that did work were from the lower working classes and many of these were minorities. There were a variety of attitudes towards women in the workforce. Some thought they should only have jobs that men didn't want while others felt women should give up their jobs so unemployed men could have a job, especially during the Great Depression. Still others held the view that women from the middle class or above should never lower themselves to go to work. These and other viewpoints would be challenged with the United States' entry into World War II. - With men off to fight a worldwide war across the Atlantic and the Pacific, women were called to take their place on the production line. The War Manpower Commission, a Federal Agency established to increase the manufacture of war materials, had the task of recruiting women into employment vital to the war effort. Men's attitude towards women in the work force was one challenge to overcome but, surprisingly, women's own ideas about work outside the home had to change as well.

<p>BOX 3: BACKGROUND</p>	<p>- A shortage of white male workers led to recruitment by the United States' government to war industry jobs. In the beginning white middle class women were recruited, followed by minority men, and finally minority women. The integration of women and minorities into the workforce was met with resistance at first, however, the new opportunities for women and minorities "cracked open" the door to equal rights and would have profound impacts on the civil rights movement and women's rights movement during the following decades. During World War II six million women entered the workforce.</p>
<p>3 MINUTES</p> <p>BOX 4: WACS AND LIFE AT THE MANHATTAN PROJECT, HANFORD</p>	<p>- Most of us know that the United States produced the first nuclear bomb in 1945 during WWII. However, less well known are the women who contributed their talents to make this event a reality. Women played a very important role in varying aspects of the Manhattan Project. They participated in both a civilian and a military capacity. However, because both the military and upper ranks of the scientific community were male dominated, the role of women was often overshadowed.</p> <p>- From a military standpoint, the Women's Army Corps (WACs) provided much of the administrative and clerical labor and generally "filled-in" wherever they were needed. Civilian women worked as nurses, physicists, engineers, machine operators, maids, runners, drivers, chemists, typists, filers, doctors, inspectors, researchers, teachers, veterinarians, cryptographers, draftswomen, pipe-fitters, glass blowers, secretaries, and gauge watchers. In most instances they were over-worked and under-paid compared to their male counterparts. Although most of the women were white, there were Latinas, indigenous women and African-American women working in connection to the Manhattan Project.</p> <p>- Hanford also had the smallest number of WACs of the three sites, with sixteen to twenty-four women posted to production work, compared to 260 at Los Alamos, NM.</p>

3 MINTUES

BOX 5: LIFE AT THE MANHATTAN PROJECT, HANFORD

- Women living and working at Hanford also dealt with immense isolation. The turnover at Hanford for construction employees varied between 8 and 21 percent over the course of the project. Women were especially isolated. Single men and women lived in separate barracks and in dormitories surrounded by high barbed wire fences. The gate was guarded 24/7, requiring residents and visitors to sign in and out.

- Although the population at Hanford was vastly dominated by single men, Hanford did have families living around the site. But unlike Oak Ridge and Los Alamos, they did not have the infrastructure most families during the 1940s relied on.

- "I was a typical housewife. They didn't have a nursery school, so I kept my daughter at home. There were very few children to play with because so few people had children." – said Meta Newson in an interview. (S.L. Sanger, 1986)

5 MINUTES

EXTENSION 2: VOTE WITH YOUR HANDS, FAMOUS SCIENTISTS DISCUSSION

- *Raise your hand if you know who Albert Einstein is? (Count how many students raise their hands).*

- *Raise your hand if you know who Marie Curie is? (Count how many students raise their hands).*

- *Raise your hand if you know who Wu Chien-Shiung is? (Count how many students raise their hands).*

- *Why do you think Americans know more about Albert Einstein's than Marie Curie or Wu Chien-Shiung? Einstein, Curie, and Chien-Shiung all made discoveries in physics in the 1900s. They all made huge contributions to the world of physics. Einstein and Curie both won the Nobel Prize. What about Wu Chien-Shiung? She is called the Queen of Physics and made significant contributions to the Manhattan Project but most Americans are more familiar with Albert Einstein. Why do you think that is? (Give students 4 minutes to discuss)*

- *Let's get back to our Caption Worksheet. You should be on BOX 6.*

<p>3 MINUTES</p> <p>BOX 6: DR. LIBBY'S CONTRIBUTIONS</p>	<ul style="list-style-type: none"> - Physicist Leona Woods Marshall Libby was one of the women who helped create the plutonium for the atomic bomb. She worked on the team that constructed the first nuclear chain reaction leading to the development of the bomb. Dr. Libby pursued a PhD in chemistry at the University of Chicago. As a PhD student, she was supervised by noted chemists Robert Mulliken and Stanisław Mrozoński. After she finished her doctorate in 1942, Libby was recruited to work with chemist Enrico Fermi and his team at the University of Chicago. - The activities carried out by Fermi's team at Chicago were associated with a nationwide atomic research program known as the Manhattan Project. When World War II began in 1939, both the United States and the United Kingdom began working to create an atomic bomb. In 1941, the United States entered the war and began to focus more attention and financial resources on atomic research. There were many facilities and scientists throughout the US who worked on this project. Laboratories existed in many locations, including Tennessee, Illinois, and Washington.
<p>3 MINUTES</p> <p>BOX 7: DR. LIBBY'S CONTRIBUTIONS II</p>	<ul style="list-style-type: none"> - Part of the process of constructing nuclear bombs was building up enough plutonium or uranium 235 to create a nuclear chain reaction. In the war, three bombs were built, one of uranium and two of plutonium. A special factory was constructed at Hanford, Washington to produce the plutonium needed to build the bomb. Later in the war, Leona Libby worked at Hanford to help produce the plutonium that would then be sent to Los Alamos, New Mexico to be further processed. The material produced at Hanford was used to make the second nuclear bomb that and was dropped on Nagasaki, Japan on August 9, 1945. The atomic bombings, combined with many other factors, helped World War II end days later. - Many of Leona Libby's fellow scientists barely acknowledged her work on developing the plutonium. When the scientists that helped make the bomb spoke about their experience, they left Leona Libby out completely or used the shortened L. Woods, her married name. Being a working-woman in the 1940s was a different time. While working at Hanford, Libby got married and became pregnant shortly after and had to conceal

her pregnancy from her male co-workers and went back to work just one week after giving birth since they needed her help.

- After the war concluded, Fermi's team held regular anniversaries at the University of Chicago to mark their achievements in nuclear research. For her achievements in science, Libby was honored by Mademoiselle magazine in 1946 by being named one of the top women of the year. In 2016, a new middle school in Richland, Washington, Leona Libby Middle School, was named in her honor.

5 MINUTES

**BOX 8: COMPARE AND
CONTRAST**

- You should have one box left. We have talked about how women were treated during the time of the Manhattan Project. For your last box you will draw a picture of a modern-day woman working at Hanford. T

-Today, women at the Hanford site help with its environmental clean-up. They help manage the site and can be found working at all types of jobs. Women also give tours of the B Reactor and explain the site's complex history, science, and engineering to visitors. Women also work as scientists at the nearby Laser Interferometer Gravitational-Wave Observatory (LIGO) where they study and listen to the universe.

- For this caption you are going to compare and contrast BOX 8 to a BOX of your choice. Your caption should include information on how things have changed for women at Hanford since WWII.

(Give students 5 minutes to draw a picture and write a caption. Hand out Boxed In: Assessment Worksheet)

<p>10 MINUTES</p> <p>ASSESSMENT: CAPTION WORKSHEET</p> <p>Hand out caption worksheet to each student.</p>	<p>- Now we are going to see what you learned today. You must work independently for this activity. In front of you is a worksheet with a list of eight captions. I am going to show you eight photos. Each photo will have a number. You are going to write the number of the photo next to the caption that best describes the photo. I will go through the PowerPoint at least two times for you to see all eight photos twice. Does everyone understand what we are doing? Does anyone have a question?</p>
<p>3 MINTUES</p> <p>CLOSING</p>	<p>Does anyone have a comment, question, or concern about the things we learned today.</p>