Japan Lesson Plan 1

Purpose:

The United States had reasons for dropping the Atomic bombs in WWII but the bombs had a horrible initial and after effect on the people of Japan.

Essential Questions:

1. How did the bombs initially effect the people of Japan?
2. Why did the US drop the bombs and why did they choose the targets?
3. What was the impact to people of Japan after the dropping of the bombs?

To expose students to what happened in Japan on the day of and after the dropping of the atomic bombs.

Mat

1. Web Sites:
   a. http://www.pcf.city.hiroshima.jp/peacesite/indexE.html
   b. http://www.csi.ad.jp/ABOMB/index.html
   c. Pictures downloaded from the internet, all pictures have the website where they were found.
2. List of questions over the handouts and pictures
3. List of answers for questions from the handouts and pictures.

1. Students will be informed that they will be reading and looking at pictures dealing with the dropping of the atomic bombs on Japan.
2. Students will be broken up into groups (group size will depend on size of class, small classes can have handouts combined into one) and given a handout (1-9) with pictures. These groups will need to answer the questions given to them and decide a way to use their answers and the pictures to present to the class.
3. Students will be given 10 minutes in their groups to answer the questions and to decide how to present to the class. Groups must use the pictures in their pesentation and each person must have a job.
4. As a class we will fill out the answers to the questions that we do not have answers to. Since each group has their own section not all answers will be known by each group.
5. At the end the teacher will restate the answers to the main questions about the dropping of the bombs. Groups will turn in a list of jobs done by each member and this will be a class work grade.

Assessment:

Class discussion about what was read and seen from the pictures. Students will also be asked to write individual responses to the essential questions discussed in class. This could also be done with the teacher leading each handout and the students answering the questions by themselves.

Grade Adaptation:

This lesson is for grades 9-12

This lesson could be made easier by having the handouts read out laud and the pictures being shown by the teacher to the class. The teacher could also lead the discussion of each of the questions with the pictures and statements.

Japan Lesson Question Sheet
WWII and the Dropping of the Atomic Bombs

Handout 1 questions:

1. What was the date that it was decided that the US would drop Atomic bombs on Japan? Why did the US want to drop the bombs on Japan? Give at least 3 reasons.
2. What was the date of the first atomic explosion and when was the order given to drop the bomb?
3. What are the 2 reasons that Hiroshima was chosen as a target?

Handout 2 (part 1) questions:

1. What was the nickname of the bomb that was dropped on Nagasaki?
2. The bomb that was dropped was equal to how much TNT?
3. What type of bomb was dropped on Nagasaki?

Handout 2 (part 2) questions:

1. What was the nickname of the bomb dropped on Hiroshima? What was the name of the plane that dropped it?
2. Who was the piolet of the plane and how did he feel about what they had done?
3. What caused the most damage from the bomb that was dropped? How big was he radius of the distruction?

Handout 3 questions:

1. What type of day was it that morning in Hiroshima?
2. What are 3 reasons why Hiroshima was so important?
3. How many students were in Hiroshima and what were they supposed to do that day? Why were the students not on vacation?

Handout 4 questions:

1. How hot was the air at the point of explotion?
2. After one second after the dropping of the bomb how big was the fireball and how long did it last?
3. What types of energy was released and how much of each was it?

Handout 5 questions:

1. How quick was the destruction of the bombs?
2. What two after effects did the victims of the bombs have to deal with?
3. As of the end of December 1945 how many dead were there?

Handout 6 questions:

1. How much and what type of damage was done to Hiroshima?
2. How fast did the wind blow at the hypocenter of the blast?
3. What danger did glass cause during the explotion?

Handout 7 question:

1. What happened to wood and paper houses?
2. How far away did heat cause combustible material to catch fire?
3. What damage did the extreme heat cause to other materials? What did the city look like after the blast?

Handout 8 questions:

1. What happened to people with in 1 km who were out in the open during the blast?
2. What effects did the radiation have 4 months after the blast? Give 3 examples.
3. How did the radiation spread to people further away from the blast? What happened to rivers and wells?

Handout 9 questions:

1. Are the full effects of the blast on peoples health known yet today? About how many years has it been?
2. What has happened to victims who suffered burns from the blast?
3. What other long term problems has the bomb caused? Give at least 3 examples.

Japan Lesson Question Answers
WWII and the Dropping of the Atomic Bombs

Handout 1 answers:
1. September 1944. **1.** Force Japan to surrender to minimize US casualties. **2.** Use the bomb before the Soviet Union entered. **3**. Use the bomb for the first time in war to gauge the effects.
2. July 16, 1945 and July 25, 1945.
3. **1.** The size and topography of the city made it suitable for testing the destructive capabilities of the atomic bomb, and for confirming the destructive effects later.
2. There was a concentration of military troops, installations, and factories in Hiroshima that had been spared previous bombing.

Handout 2 part 1 answers:
1. Fat Man
2. 21,000 tons of TNT
3. An implosion type bomb

Handout 2 part 2 answers:
1. Little Boy and the Enola Gay
2. Lt. Col. Paul Tibbets, he said in his statement, " My God, what have we done?" Students can infer what he was feeling through his statment.
3. The wind caused the most damage to the city and people. The winds came back as they bounced off the mountains. The damage radius was 1.5 miles.

Handout 3 answers:
1. The day was clear, bright, and cloudless.
2. Political and economic heart of the Chugoku Region. Center of education and a major military base.
3. 8400 students were present and they were to remove debris at demolition sites and work in the factories. The war had prevented them from taking a vacation.

Handout 4 answers:
1. The heat exceeded a million degrees Celsius.
2. The diameter was 280 meters and it lasted 10 seconds.
3. 35% was heat, 50% was from the blast and 15% was radiation.

Handout 5 answers:
1. The destruction was instantaneous.
2. They had to deal with burns and radiation.
3. There were 140,000 dead from Hiroshima.

Handout 6 answers:
1. Near where the bomb was dropped, 90% of the buildings were collapsed or burned.
2. The wind blew about 1,000 miles per hour.
3. Glass shards penetrated victim's bodies. Years later glass shards were still being found in people.

Handout 7 answers:
1. Wood and paper houses burst into flames.
2. 2 km away the damage was caused.
3. The heat melted glass and metal like lava. The city was nothing but a scorched plain.

Handout 8 answers:
1. Half of those people died from the initial radiation.
2. Destruction of cells and organs, Disorders in internal organs, lowering of immune function, Hair loss.
3. The radiation got into rain and clouds and spread far away. Radioactive soot and dust got into the air and were carried further away. Fish died in streams and people suffered from diarrhea when they drank from wells.

Handout 9 answers:

1. It has been well over 50 years and still the effects are seen today.
2. They have formed Keloids which are mounds of flesh formed by scars.
3. Lung cancer, Colon cancer, Leukemia, Thyroid, Breast cancer, Multiple myeloma. (Use graph for this answer)

Handout 1

Why the bomb was dropped on Hiroshima

In the US, with the atomic bomb development still underway, it was decided in September 1944 to use the bomb against Japan. The United States wanted to force Japan's surrender as quickly as possible to minimize American casualties. In addition, the United States needed to use the atomic bomb against Japan before the Soviet Union entered the war to establish US dominance after the war. Further, the Americans wanted to use the world's first atomic bomb for an actual attack and observe its effect. For these reasons, those in charge were in a hurry. Shortly after successfully testing history's first atomic explosion on July 16, 1945, the order to drop the atomic bomb was issued on July 25.

Based on this order, a field operation order dated August 2 called for the attack to take place on August 6, with Hiroshima to be the primary target. It is thought that Hiroshima was selected for the following reasons:

1. The size and topography of the city made it suitable for testing the destructive capabilities of the atomic bomb, and for confirming the destructive effects later.
2. There was a concentration of military troops, installations, and factories in Hiroshima that had been spared previous bombing.

http://www.pcf.city.hiroshima.jp/peacesite/English/Stage1/S1-4E.html

Handout 2 (Part 1)

The Nagasaki Bomb

Compared to one used on Hiroshima, the Nagasaki bomb was rounder and fatter, so it was called "Fat Man." The fissile material was plutonium 239. The plutonium was divided into subcritical portions and packed into a spherical case. To cause the chain reaction, gunpowder around the periphery of the case was used to force the units to the center. Thus, it was called an "implosion-type" bomb.

The fission of slightly more than one kilogram of plutonium 239 is thought to have released destructive energy equivalent to about 21,000 tons of TNT.

Length: Approx. 3.2 meters (128 inches)
Weight: Approx. 4.5 tons (10,000 pounds)
Diameter: Approx. 1.5 meters (60 inches)
Element: Plutonium 239

http://www.pcf.city.hiroshima.jp/peacesite/English/Stage1/S1-3E.html

Handout 2 (part 2)

Welcome to A-Bomb WWW Museum

"Little Boy" is the nick name given to the atomic bomb dropped on Hiroshima on ***August 6, 1945***. It was Monday morning. Little Boy was dropped from the Enola Gay, one of the B-29 bombers that flew over Hiroshima on that day.

Little Boy

After being released, it took about a minute for Little Boy to reach the point of explosion. Little Boy exploded at approximately 8:15 a.m. (Japan Standard Time) when it reached an altitude of 2,000 ft above the building that is today called the "A-Bomb Dome."

The July 24, 1995 issue of Newsweek writes:

"A bright light filled the plane," wrote Lt. Col. Paul Tibbets, the pilot of the Enola Gay, the B-29 that dropped the first atomic bomb. "We turned back to look at Hiroshima. The city was hidden by that awful cloud...boiling up, mushrooming." For a moment, no one spoke. Then everyone was talking. "Look at that! Look at that! Look at that!" exclaimed the co-pilot, Robert Lewis, pounding on Tibbets's shoulder. Lewis said he could taste atomic fission; it tasted like lead. Then he turned away to write in his journal. "My God," he asked himself, "what have we done?" (special report, "Hiroshima: August 6, 1945")
note: Paul Tibbets was Colonel, not "Lt. Colonel," when he was the pilot of the Enola Gay.

The Little Boy generated an enormous amount of energy in terms of air pressure and heat. In addition, it generated a significant amount of radiation (Gamma ray and neutrons) that subsequently caused devastating human injuries.

The people who saw the Little Boy often say "We saw another sun in the sky when it exploded." The heat and the light generated by the Little Boy were far stronger than bombs which they had seen before. When the heat wave reached ground level it burnt all before it including people.

The strong wind generated by the bomb destroyed most of the houses and buildings within a 1.5 miles radius. When the wind reached the mountains, it was reflected and again hit the people in the city center. The wind generated by Little Boy caused the most serious damage to the city and people.

http://www.csi.ad.jp/ABOMB/index.html

Handout 3

That Day in Hiroshima

Monday morning, August 6, 1945, was clear, bright, and cloudless. As the mid-summer sun climbed into the sky, the temperature rose rapidly. At 7:09 a.m. a yellow alert sounded, and many people retreated into air-raid shelters, but the attack turned out to be just one American plane flying at high altitude, the alert was lifted at 7:31 a.m. The people left their shelters and started off to work. That single plane had been observing the weather for the atomic bombing.

The city of Hiroshima was the political and economic heart of the Chugoku Region. It was an educational center as well as a major military base. On that day, some 350,000 people, including over 40,000 military personnel, are thought to have been in the city. Though it was August, the war prevented schools from taking normal vacations. Students in middle school and above were mobilized for daily work at factories or removing debris at demolition sites. On August 6, approximately 8,400 students, mainly first and second year male and female middle-school students, were scheduled to help with the demolition work. Children attending national school (now called elementary school) in the third grade and above had been evacuated to the countryside, so only young children remained in the city.

Major Military Facilities within Hiroshima City
Source: New Edition Hiroshima City History Volume 2, Political History
(Hiroshima City, 1958)
http://www.pcf.city.hiroshima.jp/peacesite/English/Stage1/S1-4E.html

Handout 4

Explosion

Based on research thus far, it is believed that the atomic bomb exploded approximately 580 meters in the air over the Shima Hospital in Saiku-machi (now Otemachi 1 chome), about 300 meters southeast of the Aioi Bridge. At the instant of detonation, the temperature of the air at the point of explosion exceeded a million degrees Celsius (the maximum temperature of conventional bombs is approximately 5,000 _C). A white-hot fireball appeared millionths of a second after detonation. After 1 second, the fireball reached a diameter of approximately 280 meters. For the following three seconds, it emitted powerful heat rays, and continued to shine visibly for approximately 10 seconds.

At the instant of explosion, intense heat rays and radiation were released in all directions. The pressure on the surrounding air created a blast of unimaginable force. The cloud generated by the explosion rose on powerful updrafts. As the pillar of radiation-laden soot and smoke reached the bottom of the stratosphere, it spread horizontally to a diameter of several kilometers, forming a giant mushroom cap. Of the energy released, about 35% was in the form of heat, 50% was blast, and about 15% was radiation.

http://www.pcf.city.hiroshima.jp/peacesite/English/Stage1/S1-4E.html

Handout 5

Nature of the A-bomb Damage

1. Massive destruction and loss of life from the enormous explosion.
2. Destruction was instantaneous.
3. In addition to suffering tremendous social and economic losses, the health of survivors was subject to continuing damage due to the aftereffects of burns and radiation. The complex effects of this permanent anxiety compounded by their other losses created numerous obstacles that impaired their recovery of physical and economic well-being.

Casualties

Approximately 140,000 dead (±10,000) as of the end of December 1945.
(Of Hiroshima's estimated population of 350,000)

http://www.pcf.city.hiroshima.jp/peacesite/English/Stage1/S1-5E.html

Handout 6

Damage to buildings

Because the A-bomb exploded close to the center of the city, and because 85% of the buildings were within 3 km of the hypocenter, destruction to the city was nearly complete, with 90% of buildings collapsed or burned. (August 1946 Survey by the Hiroshima City Government)

Damage due to Blast

At the instant of explosion, a super-high air pressure of several hundred thousand atmospheres was created at the epicenter, which generated a powerful shock wave. The air pressure at the hypocenter was 35 t/m2 . The wind blew at 440 meters per second (about 1,000 mph). Thousands of people were killed or injured when they were hurled through the air or crushed under their collapsed houses. The blast also shattered windows, filling the air with glass fragments that penetrated deep into the victims' bodies. Even quite recently, glass fragments received that August 6 have been removed from survivors complaining of mysterious pains. Nearly all wooden buildings within approximately 2 kilometers of the hypocenter collapsed; even ferro-concrete buildings near the hypocenter were crushed.

http://www.pcf.city.hiroshima.jp/peacesite/English/Stage1/S1-5E.html

Handout 7

Damage due to High-temperature Fires

The intense heat rays emitted by the explosion caused the wood and paper houses and anything burnable in the downtown area to burst into flame. Fires were also started by toppled kitchen stoves. The city-wide conflagration reached its peak between 10:00 a.m. and 2:00-3:00 p.m., but fires continued to burn intensely all day.
Most combustible material within approximately 2 km of the hypocenter was burned to cinders and ash. The extreme heat melted glass and metal like lava. When the flames died away, the city was nothing but a scorched plain stretching out in all directions.

Handout 8

Damage due to Radiation

The explosion instantly released a tremendous amount of initial radiation within 2 km of the hypocenter. Given that half of those who receive 4 grays of radiation die, it is assumed that at least half of the people who were in the open within 1 km of the hypocenter died mainly from the initial radiation.

Acute radiation effects extended for 4 months after the bombing, and these disorders appeared in survivors exposed close to the hypocenter and the characteristic radiation-sickness symptoms included destruction of cells and hematopoietic organs, disorders in internal organs, lowering of immune function, loss of hair.

The tremendous fire that burned downtown caused intense firestorms and whirlwinds. Within 20 to 30 minutes, a heavy black rain began falling in areas to the northwest. This rain contained large amounts of radioactive soot and dust, thus contaminating areas far from the hypocenter. It is said that fish died in ponds and rivers, and people who drank well water suffered from diarrhea for about 3 months.

After the explosion, high levels of residual radiation remained on the ground for an extended period. Many who did not directly experience the bomb were affected.

http://www.pcf.city.hiroshima.jp/peacesite/English/Stage1/S1-5E.html

Handout 9

The Painful Aftereffects

Radiation caused myriad disorders for decades. Even today, after more than fifty years, the full range of effects of radiation taken into the body has yet to be clarified. Many survivors continue to suffer from those effects.

Keloids Beginning in early 1946, scar tissue covering apparently healed burns began to swell and grow abnormally into mounds of thick, twisted flesh called keloids. Keloids occured in 50 to 60% of people who suffered burns directly from the heat ray within a radius of 2 kilometers from the hypocenter.These keloids were a source of great physical and emotional pain for the survivors.

Keloids on the arm and back; October 1945 / US Army photo

Leukemia

http://www.pcf.city.hiroshima.jp/peacesite/English/Stage1/S1-5E.html