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SCAN ME TO VIEW LESSON

HVL LESSON TITLE:

## **THE SCIENCE OF THE ATOMIC BOMB**

DEVELOPED BY: CHANTAYE SHAW

### **THE SCIENCE OF THE ATOMIC BOMB**

#### **GUIDING QUESTION:**

**What makes atomic bombs so dangerous and how much damage could they do?**

#### **OVERVIEW**

Watch the interview from Ted Estridge as he speaks about the Battle in Okinawa and the atomic bombing that followed in Hiroshima.

#### **OBJECTIVES**

By the end of the lesson, students will be able to:

- Identify the isotopes in atomic bombs;
- Explain nuclear fission; and
- What are the effects using an atomic bomb in war.



**Subject(s):**  
Math  
Science



**WWII Veteran(s):**  
Ted Estridge



**Duration:**  
45 minutes

# THE SCIENCE OF THE ATOMIC BOMB

DEVELOPED BY: CHANTAYE SHAW

“There would have been millions killed if we had to invade Japan. I’m just thankful that we didn’t have to.”

TED ESTRIDGE - WWII VETERAN

## OVERVIEW

Watch the interview from Ted Estridge as he speaks about the Battle in Okinawa and the atomic bombing that followed in Hiroshima.

## HISTORICAL CONTEXT

The first atomic bomb was used in Hiroshima during World War II. It caused catastrophic damage and loss of lives. However it would have been worse if the U.S. invaded Hiroshima after battling in Okinawa.

## OBJECTIVES

By the end of the lesson, students will be able to:

- Identify the isotopes in atomic bombs;
- Explain nuclear fission; and
- What are the effects using an atomic bomb in war.

## STANDARDS

### CCSS.ELA-LITERACY.RST.6-8.7

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

### CCSS.ELA-LITERACY.RST.6-8.9

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

### SEP Middle School 6-8

Develop and/or use a model to predict and/or describe phenomena.

### NSTA MS-PS1-2

Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

## MATERIALS & DOCUMENTS

### TED ESTRIDGE VIDEO:

*Surviving the Battle of Okinawa*

<https://www.youtube.com/watch?v=WqI01I9nnZY>

### DOCUMENT A:

“Ted Estridge the Soldier” graphic organizer

### DOCUMENT B:

Lab Sheet

### DOCUMENT C:

Damage after Atomic Bomb graphic

### COMPUTER WITH INTERNET ACCESS

## PROCEDURES

### ACTIVITY 01

- Show the video of Ted Estridge.
- Have students fill in the graphic organizer about Mr. Estridge.

### ACTIVITY 02

- Students will demonstrate the drop of an atomic bomb and determine how much damage it can cause. You will need a large area outside.
- You will need the following items: two large water balloons filled with water (color the water for a really fun time).

### ACTIVITY 03

- Students will research possible damage with battle.

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# The Science of the Atomic Bomb

## Graphic Organizer

As you watch the video on Ted Estridge and his role in World War II, fill in the following graphic organizer with complete sentences.

<p>Why did Mr. Estridge join the army?</p>	<p>What injuries did he suffer?</p>
<p><b>Ted Estridge</b></p>	
<p>What happened physically during the war?</p>	<p>Other Facts?</p>

# The Science of the Atomic Bomb

## Activity Sheet

### Simulating Atomic Bombs Lab Report

#### Objective

Students will simulate what it is like to be in warfare and the use atomic bomb. Students should be able to identify isotopes, protons, electron, and neutrons of an element.

#### Materials

- Large water balloons
- Water
- Lab sheet
- Large outside space
- Optional: trash bags or raincoats to cover students

#### Pre-Lab

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1. What are the two main isotopes used in atomic bombs?

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2. Read the article “Nuclear Explained” from the following link:  
<https://www.eia.gov/energyexplained/nuclear/#:~:text=In%20nuclear%20fission%2C%20atoms%20are,form%20of%20heat%20and%20radiation>.

How does nuclear fission work to cause an atomic bomb to explode?

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3. Fill in the table using a periodic table.

ISOTOPE	NUMBER OF PROTONS	NUMBER OF NEUTRONS	NUMBER OF ELECTRONS
URANIUM 235			
URANIUM 238			
PLUTONIUM 239			
PLUTONIUM 244			

Name \_\_\_\_\_

Date \_\_\_\_\_

The Science of the Atomic Bomb - Activity Sheet

## Simulating Atomic Bombs Lab Report

Document B 

### Procedure

Students will fill at least 3 balloons with water and have a bucket prepared to carry water balloons outside.

Class will travel to large outside area that has trees or bushes around which the “bombers” can hide.

Students will begin to walk around or walk low to the ground.

“Bombers” will throw water balloons into the crowd of students.

Divide into small groups to discuss how it feels to be bombed.

### Post Lab Questions

Answer in complete sentences.

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1. What did the water balloons represent?

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2. What were the “effects” of the balloon bursting in the middle of the group of students?

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3. If this were a real bomb, would anybody be able to visit this area when it is cleaned? Why or why not? Feel free to research.

# The Science of the Atomic Bomb

## Graphic Organizer

### Damage of an Atomic Bomb

Read the article “Hiroshima and Nagasaki: The Long Term Health Effects”  
from the following link:

<https://k1project.columbia.edu/news/hiroshima-and-nagasaki>

Answer the following questions in complete sentences.

How many people died altogether in Hiroshima and Nagasaki?

What are the causes of death and effects on DNA?

What were the effects on unborn children or survivors?

What evidence supports the notion that these cities are no longer radioactive?