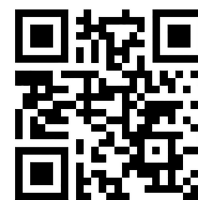




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SCAN ME TO VIEW LESSON

HVL LESSON TITLE:

SURVIVING OKINAWA

DEVELOPED BY: KATHY HIGHTOWER

SURVIVING OKINAWA

GUIDING QUESTION:

Using the interview of Ted Estridge, what were some of the health challenges the military faced that impacted their lives during and beyond WWII?

OBJECTIVES

At the end of this lesson, students will be able to:

- Reflect on the short term implications of hearing when in the midst of a battle;
- Reflect on the long term implications of hearing loss in everyday life; and
- Review a list of items that create noise and rank them on a scale; and
- Determine the percent of change of high frequency hearing loss and estimate the differences between the right and left ear progressions in loss.



Subject(s):
Math
Science



WWII Veteran(s):
Ted Estridge



Duration:
45 min.

SURVIVING OKINAWA

DEVELOPED BY: KATHY HIGHTOWER

“You are not only fighting for your country,
but you are fighting for your
loved ones back home.”

TED ESTRIDGE - WWII VETERAN

HISTORICAL CONTEXT

During World War II, over 1 million African Americans served in one of the American military branches. The United States military was still segregated and denied African American soldiers many opportunities including becoming officers and members of the airborne division. African Americans were fighting abroad for freedoms that they themselves did not receive. This denial of opportunities and advancement however, did not stop them from fighting for their country during World War II.

OBJECTIVES

At the conclusion of this lesson, students will be able to

- Reflect on the short term implications of hearing when in the midst of a battle;
- Reflect on the long term implications of hearing loss in everyday life; and
- Review a list of items that create noise and rank them on a scale; and
- Determine the percent of change of high frequency hearing loss and estimate the differences between the right and left ear progressions in loss.

STANDARDS

SCIENCE

HS-LS2-8

Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.

Clarification Statement and Assessment Boundary

Clarification Statement: Emphasis is on: (1) distinguishing between group and individual behavior, (2) identifying evidence supporting the outcomes of group behavior, and (3) developing logical and reasonable arguments based on evidence. Examples of group behaviors could include flocking, schooling, herding, and cooperative behaviors such as hunting, migrating, and swarming.

MATH

9-12.F-IF.30

Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

SURVIVING OKINAWA

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MATERIALS & DOCUMENTS

DOCUMENT A: TED ESTRIDGE VIDEO:

"Surviving the Battle of Okinawa" | Memoirs Of WWII #23

<https://www.youtube.com/watch?v=Wql0119nnZY>

DOCUMENT B: ARTICLE LINK:

The Final Campaign: Marines in the Victory on Okinawa (Assault on Shuri)

https://www.nps.gov/parkhistory/online_book/s/npswapa/extcontent/usmc/pcn-190-003135-00/sec5a.htm

DOCUMENT C: ARTICLE LINK:

33 Eye Opening Hearing Loss Facts and Statistics - 2021 — Hear Soundly

<https://www.soundly.com/blog/hearing-loss-statistics>

DOCUMENT D: ARTICLE LINK:

Decibel Levels - Measuring Dangerous Noise — Hearing Health Foundation

<https://hearinghealthfoundation.org/decibel-levels>

DOCUMENT E: ARTICLE LINK:

Degrees of hearing loss and hearing loss levels (healthyhearing.com)

<https://www.healthyhearing.com/report/41775-Degrees-of-hearing-loss>

DOCUMENT F:

Sounds at Different Decibels and the Effect on Hearing Loss: (Science Activity Sheet)

DOCUMENT G:

Hearing Thresholds of Different Frequencies (Math Activity Sheet)

PROCEDURES

ACTIVITY 01 (10 minutes)

- Encourage students to consider how the sounds of combat affect hearing health. Imagine being alongside Mr. Estridge at Okinawa. Watch the video about Ted Estridge (Document A) "Surviving the Battle of Okinawa" | Memoirs Of WWII #23
- Consider Mr. Estridge's mission back to Okinawa. What pulled him back to such a difficult setting?

SCIENCE

ACTIVITY 02 (12-15 minutes)

Students can work in small groups for this activity.

- Students will read a portion of The Final Campaign: Marines in the Victory on Okinawa (Assault on Shuri) (nps.gov) (Document B), and note how often artillery and gunfire are in play and the changing landscape. Students may skim the first seven paragraphs and begin reading in the eighth paragraph where the experience of Corporal Day is recorded. Students should read the next twelve paragraphs. (The last paragraph is just below the map image.)
- Students will then brainstorm a list of potential problems that occurred in communication during and after combat. How important would it have been for soldiers to practice loading cannons, driving tanks, moving by foot and do so without verbal communication?

Name _____

Date _____

Surviving Okinawa – Science Activity Sheet

Document F 

Sounds at Different Decibels and the Effect on Hearing Loss

In considering noise that is common to modern life, students will rank the following sounds from most safe to least safe for hearing:

Dishwasher	Whispering	Jackhammer, rock concert,
Personal listening device at maximum	Hair dryer or vacuum	or symphonic orchestra
volume	Firecracker or shotgun	Breathing
Ambulance siren and thunderclap	Subway platform	Refrigerator
School cafeteria or heavy city traffic	Jet taking off	Normal conversation

Decibels range from 0 - 165 (Fill in first two columns)

Best Guess of Sound Progression	Hypothetical Decibels	Actual Sound	Actual Decibels in Sound Progression
1		0	
2		30	
3		40	
4		60	
5		70	
6		75	
7		85	
8		95	
9		105	
10		110	
11		120	
12		140	
13		140-165	

Surviving Okinawa – Math Activity Sheet

Hearing Thresholds of Different Frequencies

An audiogram is a test that measures hearing thresholds of different frequencies in a hushed area. It detects the ability to hear. The threshold is the quietest sound one can detect about half the time.

Using “Degrees of hearing loss and hearing loss levels” ([healthyhearing.com](https://www.healthyhearing.com/report/41775-Degrees-of-hearing-loss))
(<https://www.healthyhearing.com/report/41775-Degrees-of-hearing-loss>)

- Determine the percent of change for the right ear and left ear, respectively.
- Calculate the percent of change for the right ear (old) to left ear (new). A positive percentage indicates the left ear has better hearing at that frequency.

RIGHT EAR (RED LINE)	LEFT EAR (BLUE LINE)	% OF CHANGE FROM RIGHT TO LEFT
(Hz, dB) (x,y)	(Hz, dB) (x,y)	
(250, 10)	(250, 15)	$(10-15)/10 = 50\%$
(500, 10)	(500, 20)	
(1000, 15)	(1000, 10)	
(2000, 20)	(2000, 30)	
(3000, 40)	(3000, 50)	
(4000, 70)	(4000, 70)	
(8000, 80)	(8000, 70)	
		Rate of Change= (Right-Left)/Right

x= Frequency/Pitch of a sound (Hz) - like playing the keys on a piano from left (bass) to right (treble)
y=Decibels (dB) - Volume. A zero reading is a typical baseline.

In this case, a negative value means better hearing. In the value already calculated above, the right ear can hear better than the left. The higher the decibel reading, the greater the level of loss. Calculate the percent of change for the right ear (old) to left ear (new). A positive percentage indicates the left ear has better hearing at that frequency.

PROCEDURES

SCIENCE

ACTIVITY 03 (15 minutes)

- Students will read 33 Eye Opening Hearing Loss Facts and Statistics - 2021 — Hear Soundly (Document C). Each student will identify one fact about hearing loss that was significant and share with the group and why it got their attention.
- In considering noise that is common to modern life, students will rank the following sounds from most safe to least safe for hearing Using Document F: (Sounds at Different Decibels and the Effect on Hearing Loss).

Note: Decibels range from 0 - 165 (Fill in first two columns)

Dishwasher
Personal listening device at maximum volume
Ambulance siren and thunderclap
School cafeteria or heavy city traffic
Whispering
Hair dryer or vacuum
Firecracker or shotgun
Subway platform
Jet taking off
Jackhammer, rock concert, or symphonic orchestra
Breathing
Refrigerator
Normal conversation

- After ranking the sounds, see Decibel Levels - Measuring Dangerous Noise — Hearing Health Foundation (Document D), students should fill in the last column of the chart. In their small groups, students can discuss their responses. (What surprised them most? What sounds resonate as positive or negative in one's quality of life?)

MATH

ACTIVITY 04 (15 minutes)

- An audiogram is a test that measures hearing thresholds of different frequencies in a hushed area. It detects the ability to hear. The threshold is the quietest sound one can detect about half the time.
- Using Degrees of hearing loss and hearing loss levels (healthyhearing.com) (Document E), students will determine the percent of change for the right ear and left ear, respectively.
- Using the data on the Math Activity Sheet students will calculate the percent of change for the right ear (old) to left ear (new). A positive percentage indicates the left ear has better hearing at that frequency.
- Discuss the data from the article using the following questions as a guide:

At what frequency and volume does hearing loss begin for both ears?

Which ear appears to decline more quickly?

At which frequency is the right ear on the verge of severe hearing loss?

What are the causes of high frequency hearing loss?

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