Submitted by: GENERATION CURES

TITLE: SOUND WAVES

SUBJECT: Science

GRADE: 6th

RECOMMENDED TIME: 45 minutes

GENERATION CURES CONTENT: Zebrafish Webisode 9-The Event

LEARNING GOALS:

Student will learn how sound travels through waves of vibrations. In addition to learning the basic vocabulary, students will observe sound waves travelling across a variety of mediums.

RESOURCES/MATERIALS NEEDED:

- Computer / Internet / Projector
- Pen / Pencil / Paper
- Zebrafish Webisode 9-The Event (www.kids.generationcures.org)
- Dictionary: Define
    - Wavelength- the distance between two corresponding points on a sound wave. (e.g. peak-to-peak or trough-to-trough, where peak is the high point and trough is the low point of the wave)
    - Frequency- the number of sound wave cycles that occur per second. The higher the frequency of sound, the shorter the wavelength.
    - Medium- any material or substance through which waves and energy can travel. Sound can pass through liquids, solids, or gases.

BACKGROUND:

Tanya's back. Does the microphone work? Is the sound on? She checks her microphone to see if anyone hears her. Check. She takes the stage; the fans roar. Will Vita and the band rock the school? Listen up, South High. The Zebrafish concert starts NOW!

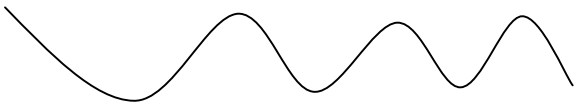
LESSON STEPS:

- Explanation: Sounds travel by producing vibrations, which then move in waves. When we listen to a stereo speaker, like the one projecting Tanya's voice at the concert or the one on the computer showing the Zebrafish webisode, the sound waves are created by vibrations at the source and spread through the air molecules until they are received in the ear. Frequency is defined as the number of sound wave cycles per second. Pitch is affected determined by the frequency of the sound wave,. The more wave cycles per second, the higher the pitch. A low

frequency, long wavelength sound wave is perceived as a low-pitched sound. A high frequency, short wavelength sound is perceived as a high-pitched sound.

- Connection: Ask the students to take out their paper and pencil and draw the following:

Example:



Wavelength

- Set up four stations on a desk, table, or workspace including the following:
    1. A drum (or a coffee can with wrapping paper stretched across the opening) with a few paper clips on top.
    2. A glass of water with a metal utensil such as a fork or a spoon (preferably not a knife).
    3. A rubber band stretched between two points.
    4. Two metal utensils.
- Send students to each station and to make noise using the utensils. Students should observe the following at each station:
    1. Sound waves pass through the paper clips as they bounce and vibrate on the top of the drum as students strike it. They can both hear the effects of their actions and they can see them in the paper clips.
    2. Students can see the sounds waves passing through the water when they tap the side of the glass.
    3. When students strike two metal objects together, they can see, hear, and feel the vibrations that carry the waves of sound.

EXTENSIONS:

- Instruct students to go home and find an instrument that carries or amplifies sound waves. Ask the students to describe the sound production and the method of carrying that sound. Is it a string instrument? A percussion instrument? Can you see the sound waves moving across a medium?