**Title:** How Does Noise Damage Your Hearing?

**Description:** According to the World Health Organization, nearly 50% of persons aged 12-35 years could be exposed to unsafe levels of sound from the use of personal audio devices. Around 40% of persons in that age range could be exposed to potentially damaging levels of sound at entertainment venues.

Hearing loss can result from a single loud sound (like firecrackers) near your ear. Or, more often, hearing loss can result over time from damage caused by repeated exposures to loud sounds. The louder the sound, the shorter the amount of time it takes for hearing loss to occur. The longer the exposure, the greater the risk for hearing loss (especially when hearing protection is not used or there is not enough time for the ears to rest between exposures).

We are constantly experiencing sounds in our environment, such as television, radio, household appliances, street noises and traffic. Normally, these sounds are at safe levels that don’t damage our hearing. But sounds can be harmful when they are too loud, even for a brief time, or when they are both loud and long-lasting. These sounds can damage sensitive structures in the inner ear and cause noise-induced hearing loss (NIHL). The purpose of this intervention is to increase awareness among parents of children ages 8 to 12 about the causes and prevention of noise-induced hearing loss.

This project will be carried out in the form of an intervention. HSTA GA’s will create a PPT presentation for high school students to use for their intervention when facilitating this presentation to high schoolers or middle schoolers. This PPT will give HSTA students a guide for their intervention to run smoothly so they can perform a more sufficient statistical analysis of the data that will be collected from this project. HSTA GA’s will also create a pre- and post-test for students to use for data analysis.

**Draft Procedures:**

1. Read through the project outline, pre- and post-test, and supplemental PPT provided by GRA’s.
2. Recruit 30 participants for intervention - use the recruitment/cover letter script when recruiting folks to participate in your intervention. Be sure to record how you recruited these participants (social media, word of mouth, online survey sent via text, etc.)
3. Before the intervention, go over the supplemental PPT provided with a HSTA teacher and/or GA/CRA so you are prepared.
4. **(Slides 1-7)**: When all of your participants are gathered, introduce yourself to them and go through the supplemental PPT until you get to the “Pre-Test/Post-Test” slide (slide 7). Once you arrive at this slide, give your participants the pre-test.
   1. Give your participants 5-10 minutes to complete the pre-test.
5. **(Slides 8-11):** This is why it is important to read the full article before your intervention. Starting on slide 8, you will be presenting the discussion portion of the intervention. This is where the questions from your pre-and post-test will come from. Do not read directly off of the PPT - either make mental notes or notes on an index card to go more into depth about the newspaper article in which this intervention is based on. A helpful tip during your intervention is anecdotal evidence - do you have experience with polluted water? Do you have a hard time accessing clean water from your house? If you are comfortable doing so, feel free to share these experiences as you present.
6. **(Slides 12-13):** After the supplementary material has been introduced, click on the video in the PPT (it should play directly from the slide). Once the video is done, ask your participants about what they have learned about noise damage.
7. **(Slides 14-15):** After you have completed the video discussion with the participants, click onto the next slide, which should be entitled “05: Post-Test” (slide 14). Slide 15 will say “Post-Test Time”, and this is when you administer the test.
   1. Give students another 5-10 minutes to complete the survey. Once the survey is completed, collect it from them and complete the intervention.
8. **(Slides 16-17):** Slide 16 will have your wrap-up slide. Allow your participants to ask questions, make comments, and clarify any confusion they had during your presentation. If none of your participants have any questions, or after you have finished fielding your questions, click next to slide 17. You are now finished with your intervention.

**Materials and summary of procedures:**

* **Materials**
  + It's a Noisy Planet. Protect Their Hearing® article
  + PPT for guided intervention as provided by HSTA GA’s
  + Pre- and post-test as provided by HSTA GA’s
* **Populations**
  + Middle school aged students (10-14)
  + High school aged students (14-18)
* **Data comparisons**
  + Differences among gender
  + Differences among age group
  + Differences among students at different schools
* **Possible controls**
  + Gender
  + Grade level
  + Using students from a different school

**Possible research questions and data analysis**

* After an educational intervention on how noise can cause hearing damage, will there be a statistically significant difference in knowledge scores among females in fifth grade who attend ABC Elementary School?
  + Independent Variable: Pre Intervention and Post Intervention
  + Dependent Variable: Pre and Post scores
  + Control: no control group
  + Constants: same survey questions, same intervention, same school
  + Data Analysis: t-test to compare STEM interest scores among Pre intervention and Post intervention for fifth grade female students
* After an educational intervention on how noise can cause hearing damage, will there be a statistically significant difference in knowledge scores among females in fifth grade who attend ABC Elementary School?
  + Independent Variable: intervention and no intervention
  + Dependent Variable: change scores
  + Control: the group with no intervention
  + Constants: same survey questions, same intervention, same school
  + Data Analysis: t-test to compare change in STEM interest among intervention and no intervention groups
* After an educational intervention on how noise can cause hearing damage, will there be a statistically significant difference in knowledge scores, among middle school females and males who attend ABC Middle School?
  + Independent Variable: Gender
  + Dependent Variable: change in score
  + Control: no control group
  + Constants: same survey questions, same intervention, same school
  + Data Analysis: t-test to compare change in scores for females and males
* After an educational intervention on how noise can cause hearing damage, will there be a statistically significant difference in knowledge scores pre and post scores for students in grade (level A) and students in grade (level B)?
  + Independent variable: different grade levels
  + Dependent variable: change in scores
  + Control: no control group
  + Constants: the content of the intervention, survey questions, same school
  + Data analysis: t-test to analyze change in scores [ANOVA if you are comparing three or more grade levels]

**Recruitment/Cover Letter Script:**

Hello! My name is [insert name here]. I am a [insert school year here] at [insert high school here] who is working on a project for [insert HSTA region here] Health Sciences and Technology Academy (HSTA). The project I am conducting this year is an intervention exploring noise damage prevention knowledge. I will be providing an intervention to [middle school or high school students] at [insert school name here]. This intervention will include a pre- and post-test in order for me to collect data to see [make research question you selected into a statement and insert here]. The intervention should take around 30 minutes, with each survey taking around 5-10 minutes each. No personal data will be collected, and each participants’ identity will be protected. Any participant may back out of the intervention at any time. Thank you for your participation - this research project will allow me to educate my peers about noise damage prevention.