STEAM: Sound Project

Overview: Students will explore sound waves over a two-and-a-half-week period. They will showcase their findings in the form of a MS Sway and present them to the class. Within the Sway the students will record various sounds throughout their house, determine the pitch/frequency and the intensity (dB) of those sounds. In addition, the students will create their own musical instrument and play "Mary had a Little Lamb". They video tape their performance and include the video in their presentation. Finally, they will present their Sway to the class and explain their findings.

Grade Level: 8	**Quarter: 3rd**

Standards: *List relevant STEAM – Science, Technology, Art, & Math standards.*

Science

S8P4. Obtain, evaluate, and communicate information to support the claim that electromagnetic (light) waves behave differently than mechanical (sound) waves.

a. Ask questions to develop explanations about the similarities and differences between electromagnetic and mechanical waves.

c. Design a device to illustrate practical applications of the electromagnetic spectrum (e.g., communication, medical, military). d. Develop and use a model to compare and contrast how light and sound waves are reflected, refracted, absorbed, diffracted or transmitted through various materials.

e. Analyze and interpret data to predict patterns in the relationship between density of media and wave behavior (i.e., speed).

f. Develop and use a model (e.g., simulations, graphs, illustrations) to predict and describe the relationships between wave properties (e.g., frequency, amplitude, and wavelength) and energy.

Art

MSGM8.CR.2 c. Use a variety of traditional and nontraditional sound sources and digital tools when composing and arranging music.

MSGM8.CN.1 Connect music to the other fine arts and disciplines outside the arts.

b. Discuss the interrelated principles between music and other subject areas.

Science and Engineering Practices	Crosscutting Concepts
Phenomenon: Claims, Evidence, Reasoning (CER) Ultrasonic Waves **Asking Questions and Defining Problems** A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world works and which can be empirically tested. **Developing and Using Models** A practice of both science and engineering is to use and construct models as helpful tools for representing ideas and explanations. **Constructing Explanations and Designing Solutions** The products of science are explanations and the products of engineering are solutions.	**Patterns.** Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them. **Energy and Matter** Tracking energy and matter flows, into, out of, and within systems helps one understand their system's behavior. **Systems and system models.** Defining the system under study—specifying its boundaries and making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering. **Cause and Effect.** Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering