Siren Sounds

Wee-oh, wee-oh, wee-oh! Can you hear the siren sounds in your head? What causes the pitch to change? Explore the relationship between wavelength and frequency to create an array of pitches!

TEKS:

SCI 2.6A: The student investigates the effects on objects by increasing or decreasing amounts of light, heat, and sound energy such as how the color of an object appears different in dimmer light or how heat melts butter.
SCI 3.6A: The student is expected to explore different forms of energy, including mechanical, light, sound, and thermal in everyday life.

Materials:

- Cardstock
- Girlstart Siren Sounds template – attached below
- Hole punch
- Scissors
- Small battery/USB powered foam fan – can be purchased here
- Small Phillips screwdriver
- Straw
- Tape

How To:

1. Download and print the Girlstart Siren Sounds template onto cardstock.
2. Cut out the template. Try to keep the edges as smooth as possible.
3. Using a hole punch, punch out all of the solid, black circles.
4. Use a small Phillips screwdriver to remove the foam blades from the small fan.
5. Center the template over where the blades used to be and press the template onto the fan.
6. Put the removed fan blades back onto the fan to sandwich your Girlstart Siren Sounds template between the fan base and the blades. Note: If you cannot remove the fan blades, the template can be taped to the foam blades instead.
7. Turn on the fan to spin the Girlstart Siren Sounds template.
8. Use a straw to blow air at the template's outermost ring of holes. Listen for the siren sounds!
9. The template contains different rings of holes that are measured at different distances from the disk's center. Continue blowing air and changing your aim from ring to ring. Discover how the sounds change!

STEM Explanation:

Sound is created by waves that are caused by vibrations in the air. These vibrational waves push the air around it to transfer the sound energy through waves that eventually reach your ears. Soundwaves are unique because they work as compressions and expansions of air; therefore, obstacles between a sound source and a person's ears can alter the sound! In the Siren Sounds activity, the air blown onto the template creates a sound as it hits the cardstock. However, the air from the straw was aimed at different rings of holes, which are obstacles that create those air compressions and expansions to determine the sound's waves! Did you notice how each ring of holes created a different pitch? Pitch is the highness or lowness of a sound's tone based on the rate of vibrations that make up the sound, or the sound frequency. On the Girlstart Siren Sounds template as the disk spins, the fewer number of holes in a ring yields a lower frequency and lower pitch. The larger number of holes in a ring yields a higher sound frequency and higher pitch. This occurs because more holes allow for the air to compress and expand more times, creating shorter wavelengths. The shorter wavelengths mean more waves, a higher frequency, can occur in one rotation of the template. Now that you know about sound waves, frequency, and pitch, try designing your own Siren Sounds template to create new sounds!

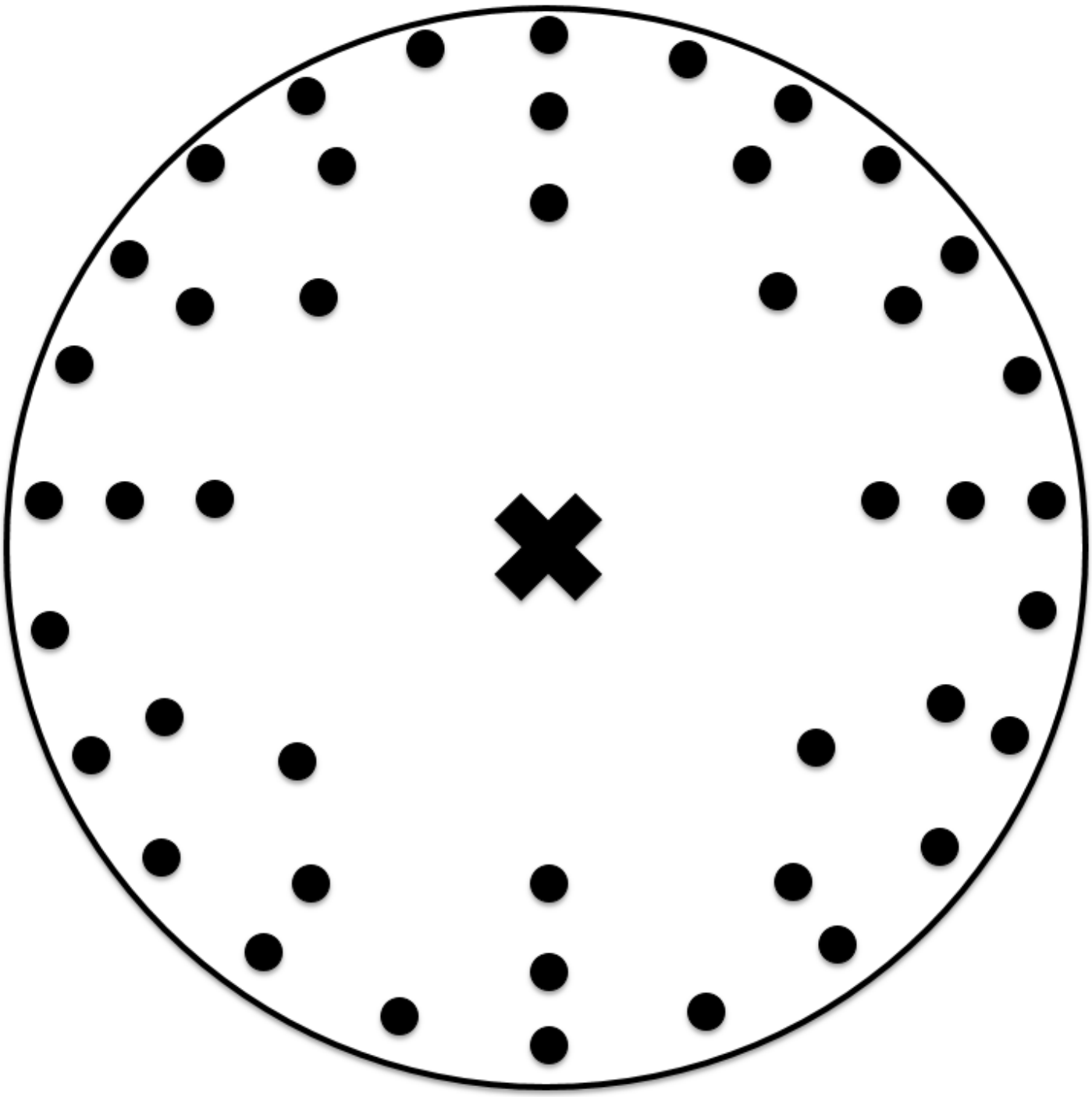
Career Connection:

Acoustical engineers study the science of sounds and vibrations. They look for ways to limit unwanted sound and maximize desired sound to design, analyze, and control sound in different environments. Acoustical engineers are an important part of the music industry, auto manufacturing, architecture, or work to control sound and vibrations in buildings, music studios, aircraft, cars, and outdoor environments like car traffic and industrial equipment.

Resources:

https://www.exploratorium.edu/snacks/siren-disk
https://www.amazon.com/VORCOOL-YGH365B-Mini-Handheld-Fan/dp/B01AROBNKO/ref=sr_1_5?ie=UTF8&qid=1533916858&sr=8-5&keywords=small+foam+fan

Girlstart Siren Sounds Template



31 Days of STEM Fun!