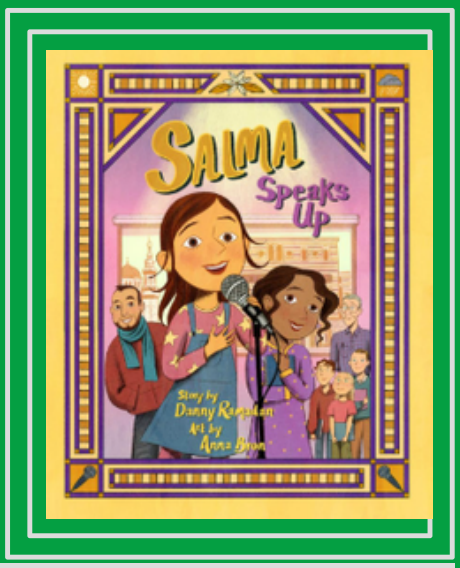
“Salma Speaks Up” by Danny Ramadan



Making Your Voice Heard: The "Amplifier Challenge"

The Problem in the Book: Salma and Riya want their voices and poems to be heard and respected in the Speech Club, but sometimes their confidence (their "voice volume") is low due to criticism.

The Science of Sound: Explain that sound is made by vibrations traveling through the air in sound waves. A regular voice produces sound waves that spread out in all directions, making them weaker the farther they travel. Amplification is making the waves stronger or making them travel in one specific direction.

The STEM Challenge: You are a team of engineers tasked with building an acoustic amplifier (a device that magnifies sound without batteries) to help someone's voice be heard clearly and confidently across a short distance.

Forest Of Reading

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The "Amplifier Challenge"

Design Constraints:

1. Acoustic Only: No electronics or batteries allowed.
2. Size: The device must be able to fit on a student's face to speak through it.
3. Function: The device must visibly (or audibly) improve the clarity or projection of a voice over a distance of at least 5 feet.

The Engineering Process:

1. **Design (E-Sketch):** Students draw a sketch of their plan. They should think about the shape of the amplifier. Hint: Will a cone shape or a rectangular shape work better? Why? (A cone shape collects and directs sound waves.)
2. **Build:** Students cut and assemble their materials. Focus on making sure all seams are sealed with tape so the sound waves don't escape.
3. **Test:** Students take their finished device to a designated testing area.

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Testing and Evaluation

1. **Testing Setup:**
    - Mark a "Speaker Spot" and a "Listener Spot" 5 to 10 feet away.
    - The speaker says a phrase (e.g., "My voice is my map!") at a normal speaking volume without the amplifier.
    - The listener uses a simple Sound Scale to rate the clarity (1 = very quiet, 5 = very loud/clear).
2. **Amplified Test:** Repeat the test using the student-built amplifier.
3. **Data Collection:** Record the "Before" and "After" scores for each device.