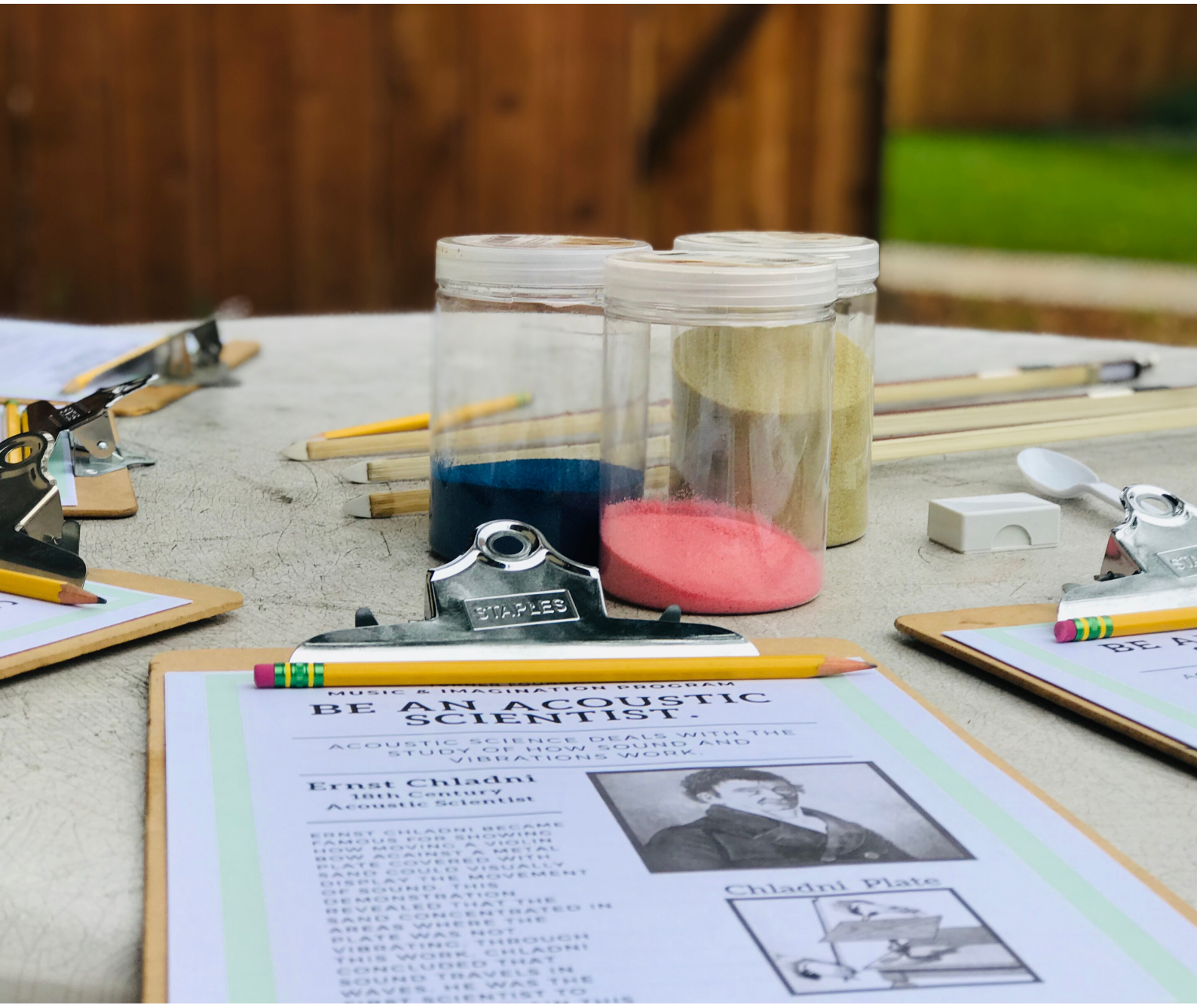
TURNER FOUNDATION
SINCE 1958

THE TURNER FOUNDATION YOUTH PROGRAM REPORT

Be An Acoustic Scientist (B.A.A.S).

Music & Imagination Program

Sept. - Dec. 2019



Prepared by: David Rojas

Turner Foundation | Music Director

BE AN ACOUSTIC SCIENTIST.

PROGRAM OVERVIEW

Below are some program details you can start with:

01 **LEAD BY:**
David Rojas | Music Director

02 **NUMBER OF PARTICIPANTS:**
15 Participants.

03 **TARGET AGE GROUP:**
Ages 7-14.

04 **TURNER FOUNDATION PROGRAM | YES OR NO?**
Yes.

05 **PROGRAM DURATION:**
1.5 Hour(s).

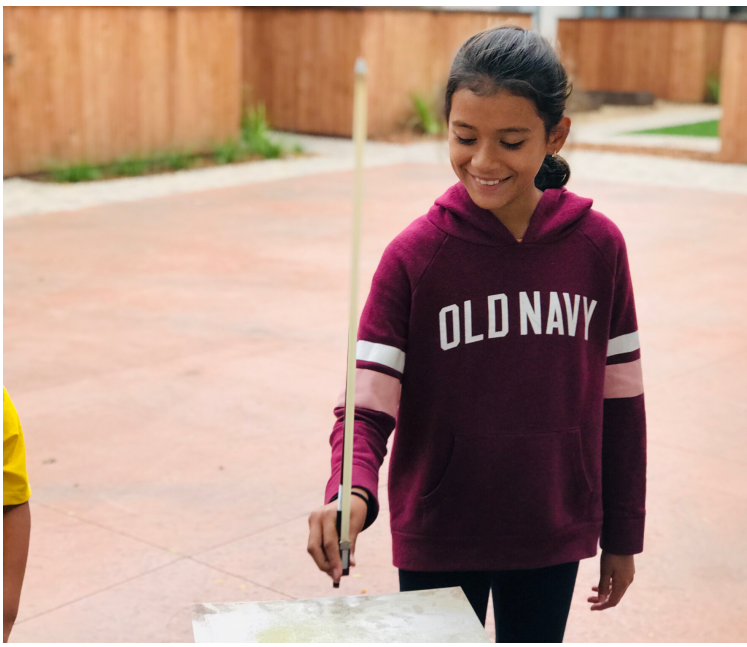
06 **PROGRAM SESSIONS:**
5 Sessions.

07 **TARGET SUBJECTS:**
Music Education, Science Education, & History/Social Studies.

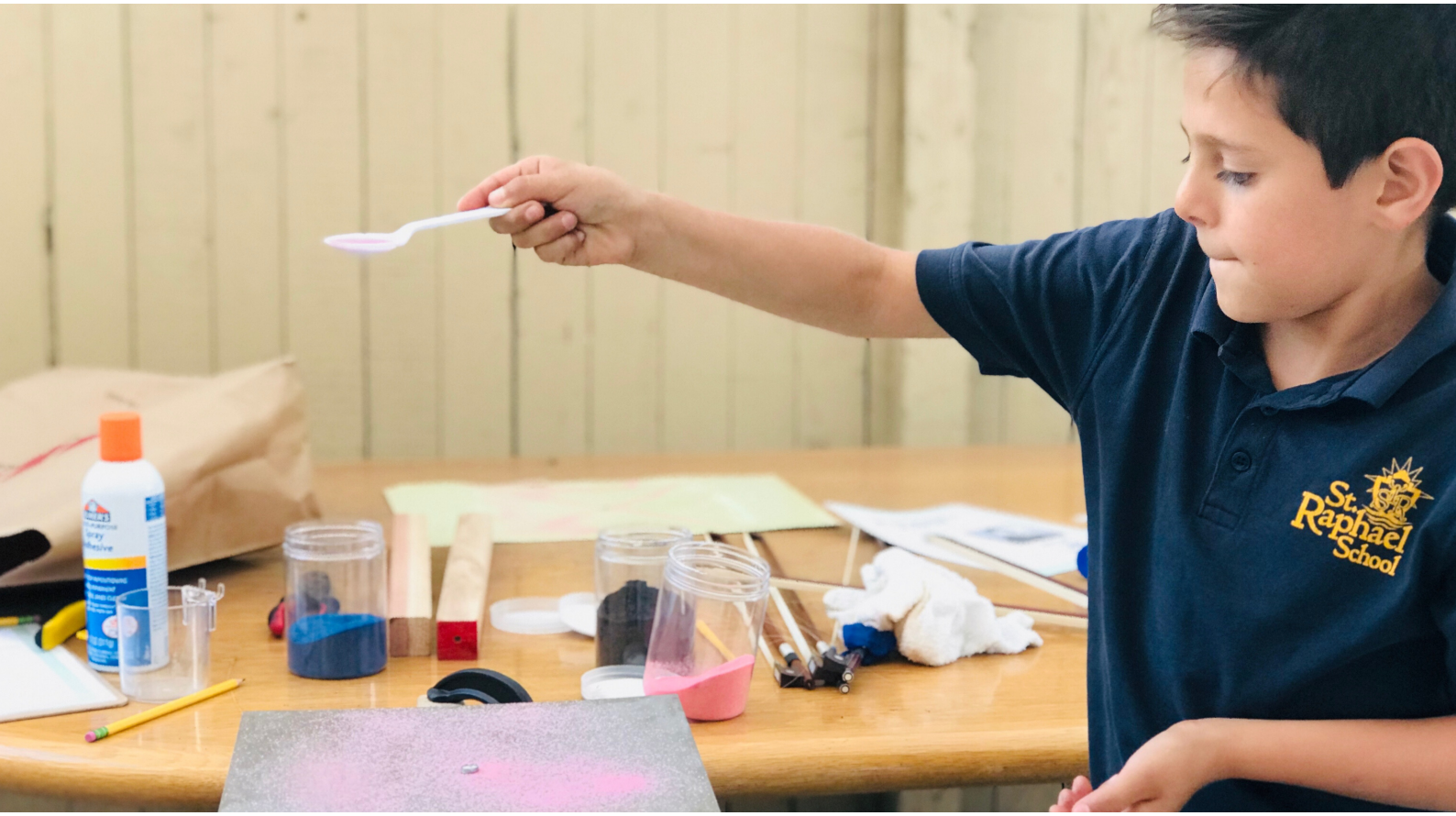
REFLECTION

The Turner Foundation's Music and Imagination Program is very happy to have successfully completed *Be An Acoustic Scientist Workshop Program*. Our bright young students deemed it a fun-meaningful experience and were grateful for being able to participate in the acoustic science workshop.

Moreover, Our students are most excited about participating in other innovative workshop programs. Our music program is thrilled hear this positive feedback from our students and look forward to educating our youth with more compelling workshops.



PROGRAM PURPOSE



WHY LEARN ABOUT ACOUSTIC SCIENCE?

Sound can be a difficult topic for students to understand, and they often have misconceptions about it. The *Be An Acoustic Scientist Workshop Program* is designed to address these misconceptions and highlight the scientific side of music. The purpose of this workshop is to introduce and define the study of acoustic science, display how sound is created, how sound travels, what sound can travel through, and how music is composed of vibrations and sound waves whose movements are governed by scientific principles.

Through enabling our youth to develop a greater understanding of acoustic science they are able to see music as a fascinating combination between art and science.

PROGRAM DESCRIPTION

CONTEXT

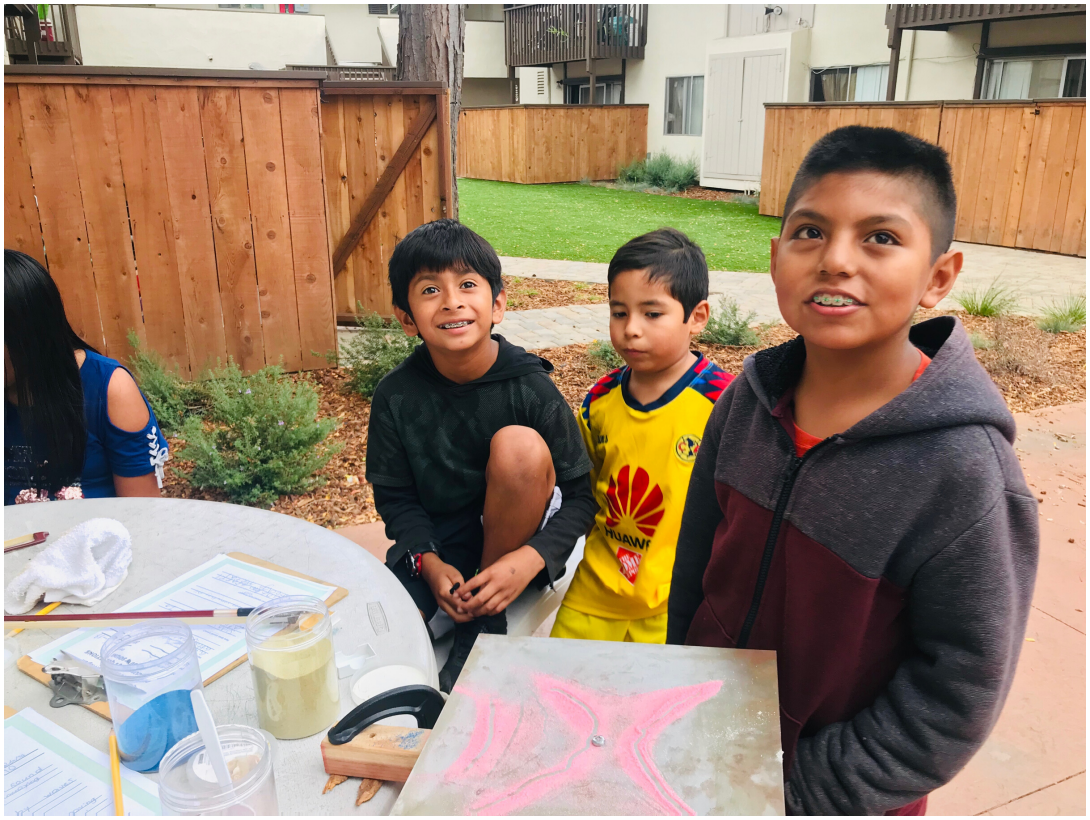
Ernst Chladni, an 18th century German scientist and musician, was a pioneer in the field of acoustics, the science of sound. In a famous experiment, he showed how moving a violin bow against a metal plate covered with sand could visually display the movement of sound. The sand concentrated in areas where the plate was not vibrating. Through this work, Chladni concluded that sound travels in waves. He was the first scientist to clearly demonstrate this connection.

WORKSHOP

During the workshop all our students received worksheets and a brief run-through about acoustic scientist, Ernst Chladni, and his groundbreaking work. We then started a youth discussion and answered some preliminary questions about the characteristics of sound. After receiving a wide range of great answers from our students we moved onto participating in a teacher demonstration of Chladni's famous experiment. As students observed the experiment they were immediately "wowed" by the physical phenomenon created by the sound.

Following the shocking demonstration the students were then asked to re-create the experiment themselves. Each student was given a turn to sprinkle colored sand onto the metal plate and run a violin bow against the it over five trails. After completing their trails the students discussed the patterns they generated and how they illustrate the movement of sound. By the end of the experiment each student was able to identify where the plate vibrated and created sound along with pinpointing the areas that did not vibrate known as nodes. We finished the workshop by answering some reflective questions about what we experienced and learned. This gave our students the opportunity to compare their final answers with the ones they wrote in the beginning and share their favorite moments of what they did during the workshop. All the students who participated eventually left the workshop fulfilled and thrilled about being able to learn in such a fun and rewarding way.

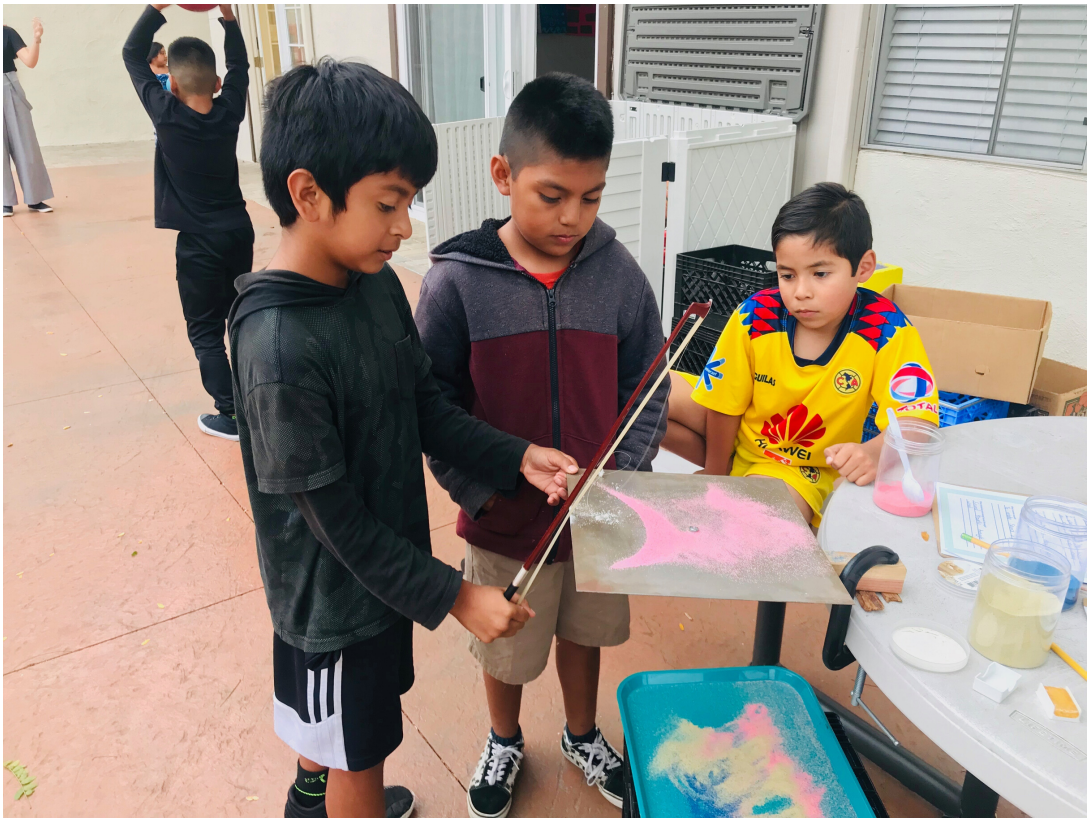
Guillermo Gomez, 10.



Right-side of photo.

“It was really cool to see the sound vibrations move the sand on the Chladni plate.”

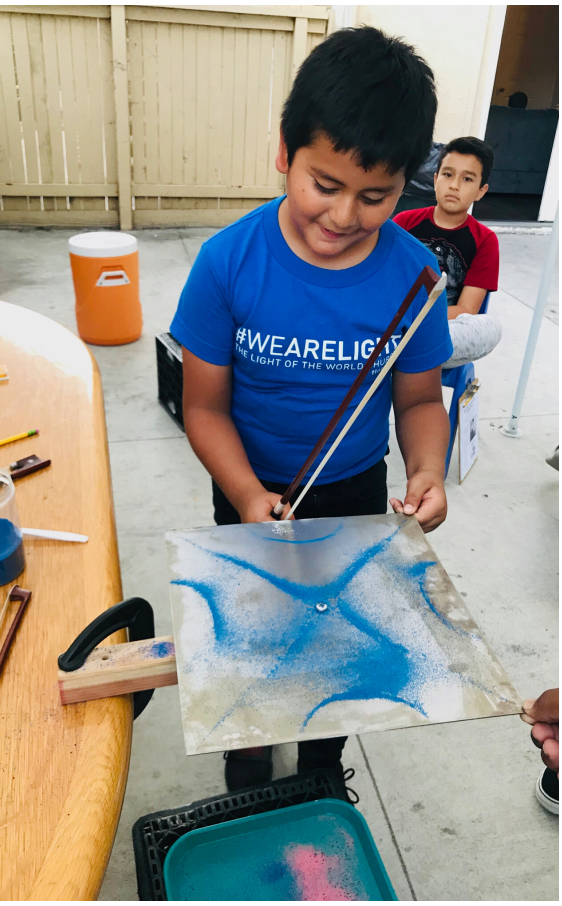
Eduardo Luis, 9.



Left-side of photo.

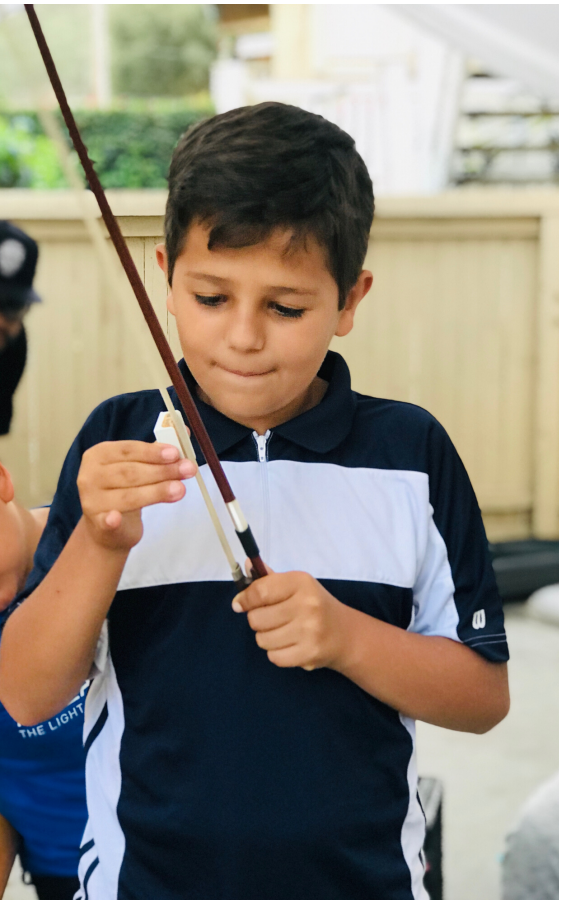
I had a lot of fun making sound with the violin bow and the metal plate. And it was amazing learning about the sound waves.

GOALS & RESULTS



INITIAL RESULTS

Our first significant result of participating in the B.A.A.S workshop program is students satisfying their innate desire to know about the natural world around them. Young people are inquisitive explorers by nature which allows them to think freely and enjoy learning when "wowed" by a great science presentation or workshop. Our students successfully had this meaningful experience and enthusiastically walked away with a new and clear understanding of acoustic science through the great work of Ernst Chladni. Through increasing our youths knowledge of sound the Turner Foundation music students have gained additional necessary skills to continue to mature into well-rounded musicians as well as life-long learners.

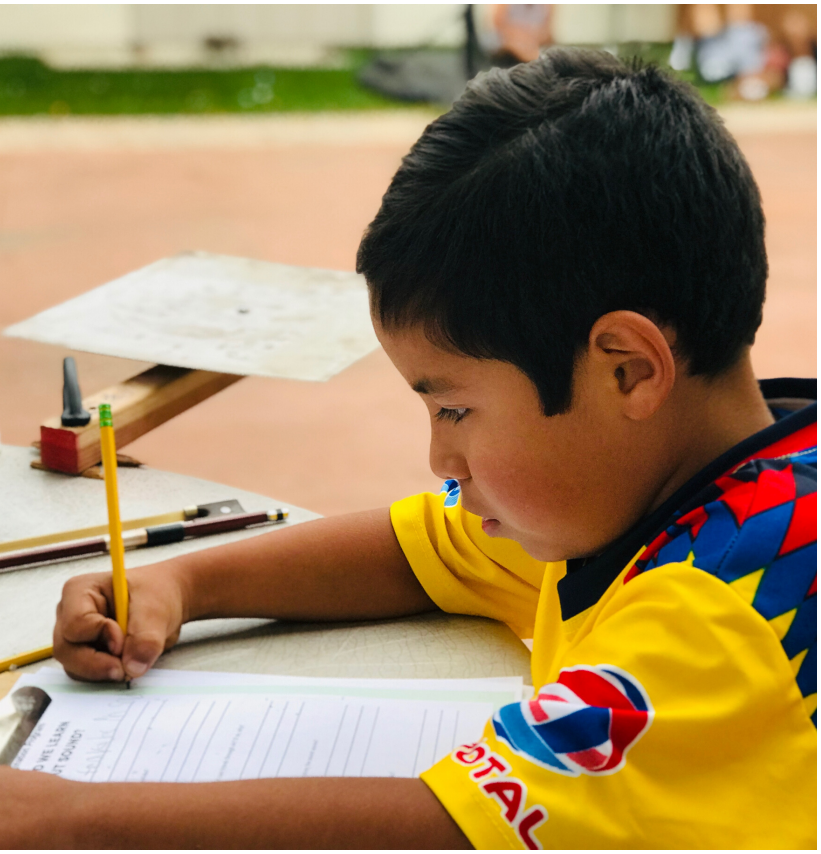


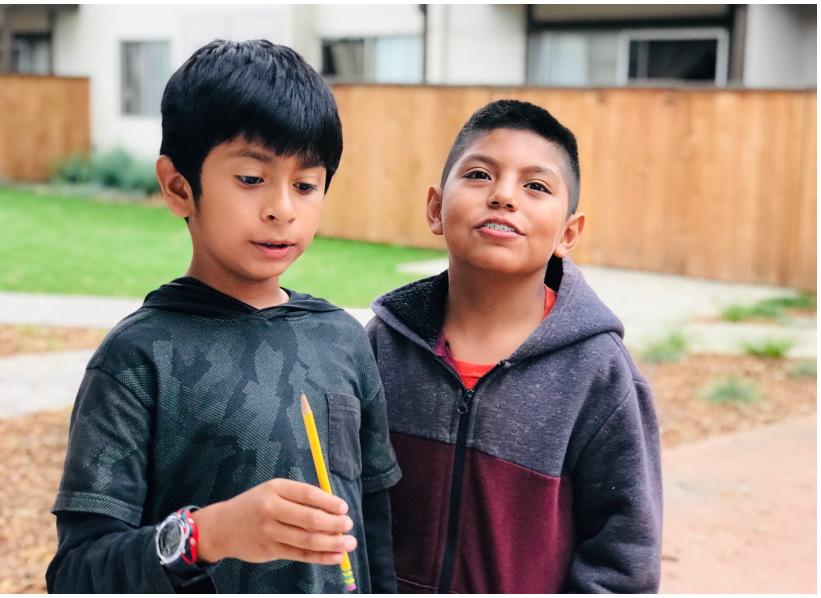
SECONDARY RESULTS

The underlying skills exercised and acquired during the B.A.A.S. workshop were critical thinking, communication, patience, and focused listening. Many of the students applied these skills without knowing they were. Our discussions were full of analysis and objective talking points that were decently articulated. Along with growing their analysis and communication skills they also practiced patience as they politely waited for their turn to bow the metal plate during the activity. These are the sort of skills that will be invaluable for the rest of their life and will enable them to lead their lives with more courage and purpose.

TYPE OF ASSESSMENT

The B.A.A.S workshop measured the growth of each student by providing a skill assessment sheet that documented each participants knowledge of acoustic science. These assessments contained before and after questions that revolved around the Chladni experiment activity.





After reviewing all the assessments they revealed that 90% of our youth who participated in the workshop could theoretically grasp the concepts and understood the scientific jargon being taught and used. We also learned that 100% of our youth saw that there was a scientific side to playing music and that they all concluded that musical instruments fundamentally create sound the same way. We were very excited to see that they were able to recognized that connection. Overall, our music program was thrilled to know that the B.A.A.S workshop was an educational success and was positively mind altering for our youth.

Be An Acoustic Scientist | Activity

Workshop photos.