

The Science of Making Music

Would you like to make music? Have you always wondered how this could be done? This project offers you the opportunity to create music and musical instruments using different tonalities (sounds) and meters (beats). The musical instrument creation and performance will allow you to collaborate and learn together. Anything goes for a scientist in a Maker Music environment!

Luigi Russolo, a composer, wrote *The Art of Noises* to say that all sounds are music. The sound of a drum is music, but so are the sounds of a blender, a rubber band, a piece of paper, a computer, a robot, tapping feet, and clapping hands.

We will be making musical instruments out of everyday objects. These musical instruments will be used to create a song and performance using the coding robots Dot and Dash, Dash's xylophone, and computer applications. This song will then become our class song!

Project Tasks

1. In groups of three to five people, choose five everyday materials, such as paper plates, kitchen utensils, tools, and so on. Explore these materials for tonalities or sound. Use your "Feel the Vibration" figure to record your findings.
2. Now, let's have a classroom discussion about this exploration.
 - ◆ Did the materials make sound?
 - ◆ What did you do to the material to produce the sound?
 - ◆ Could you hear differences in sounds between different materials?
 - ◆ Could you feel the sound?
 - ◆ Look at your rubber band, and make a sound vibration by stretching and plucking it. Can you feel the vibration?
3. In your group, use the same five everyday materials to try to create a pattern of sound or meter.
 - ◆ Create some patterns of sound that are fast.
 - ◆ Create some patterns of sound that are slow.
4. Demonstrate your group's slow and fast patterns of sound or meter. After each group's demonstration, we will repeat the pattern with your chosen instrument.
5. Now that you know about everyday materials' vibrations and tonalities, create an instrument that makes a sound.
6. Pair with a friend to use the iPad with the Xylo app to explore plotting tonalities or sounds to create meter. Each group will contribute their Xylo app meter of music to create the transition song for the class.

You will be able to use the Xylo app to create meter by tapping your finger on the meter bars provided. Each tap of your finger will create a sound that will have different tonalities based on the color bars. Place sounds or tonalities in different spots on the Xylo app to create meter.

7. Share your Xylo app meter creation to contribute to the class song.
 - ♦ The group song will be created by opening an empty song and having each group enter its meter. This will create and play the class song to which you will play along.
 - ♦ Prepare to perform your song with Dash and the Xylo app. You will play along with your created instrument. Record your performance with other students using the recording device.
8. All songs will be played for the class. The class will decide each song's purpose. For example, one song may be the song to line up, one may be a transition to a different subject, or one may signal it's time to go to recess or another activity.

Note whether there is a vibration with the sound.

Feel the Vibration

MATERIAL NUMBER	NO 	I DON'T KNOW 	YES 
1			
2			
3			
4			
5			

Scoring Rubric

QUESTIONS TO ASK	YES	NO
Does your instrument make vibrations and sound?		
Did you create a meter for your song?		
Did you place plot points on the Xylo app?		
Did you play your instrument during the performance?		