Boomwhacker Lesson Plan: (40 minutes)

Materials:
Boomwhackers (Bought or handmade)
- Homemade options:
  http://themoneylessmusicroom.blogspot.com/2016/03/four-ways-to-make-your-own-boomwhackers.html

These are Boomwhackers. They are tubes tuned to a musical note by cut length.

Options for Inquiry and Student Voice and Participation: (10 minutes)

- Who knows what these are?
- Which not will be higher?
  (Shorter)
- Why?
  (Shorter frequency leads to higher frequency and a higher pitch)
- What do you think would happen if I put a cap on the end of these and hit it?
  (It would go down an octave.)
- Why?
  (The sound wave would have to travel twice as far.)

Options for Discussion: (10 minutes)

- Acoustics, both in the ear: amplification and attenuation.
- Will is sound differently in a classroom versus somewhere like an auditorium?
- Resonance (Compare to a tuning fork if you have one.)

Options for Activity: (20 minutes)

Follow Along Boomwhacker Sites (YouTube)
Mystery Boomwhacker
Create a song.
Let’s talk about some other STEM lesson options with these. Let’s get creative.

Relationship-building:

Get with you partner and figure out how to play a song everyone knows.

**Future career options discussion: (20 minutes)**

**WHAT CAREERS CAN MUSICIANS DO IN STEM?**

Computer Science: Web and mobile app developer  
External Hardware programmer  
Recording Engineering  
Electrical Engineers  
Physical engineers (audio analysis)  
Mechanical Engineers (Chamber reverberation)  
Electro Acoustic Design  
Control Rooms/Studio Operators  
Live Music Amplification for Theaters or Concert Halls

**Follow Up Reflection Project OPTION (Over the course of a week or a few days)**

- Students write a story (1 hr-2 hr)  
  You can set parameters if you want (character, genre, length, etc.)  
- Have them film it on some device (THIS GIVES OPPORTUNITY FOR TECH DISCUSSION) (1-hr)  
- Have them make sound effects using all sorts of different sound items available in the room, (1-2 hrs) and have them EXPLAIN why it makes those sounds.