Unit Waves and Sound: Day 12: Musical Instruments

Grade 11

75 min	**Learning Goals** • Clarify the concepts of waves in strings when the length of the string is changed. • Clarify the concepts of waves and resonance in air columns. • Clarify the concepts of vibrations. **Curriculum Expectations** • E2.1 use appropriate terminology related to mechanical waves and sound, including, but not limited to: longitudinal wave, transverse wave, frequency, period, cycle, amplitude, ... • E2.6 predict the conditions needed to produce resonance in vibrating objects or air columns (e.g., in a wind instrument, a string instrument, a tuning fork), and test their predictions through inquiry	**Materials** • Stringed instrument (e.g. guitar) • Wind instrument (e.g. trombone, vuvuzela) • Percussion instrument (e.g. bongo drums)
Minds On… 5min	• Play a variety of guitars, vuvuzelas and bongo drums.	Teacher reference:

Action!
 	
35 minutes
 	
25 minutes
	• **Investigate the sound from a vuvuzela**:
	  • The students will be given different sized guitars, vuvuzelas and drums and will investigate the sound characteristics.
	  • Using a frequency analyzer, the students will examine the sound emitted by their instrument.
	  • Student will measure the sound intensity using a sound pressure level meter.
	
	• **Whiteboard Activity**
	  • Groups will record their findings and present to the class.
	  • Comparisons between the different instruments will be made by the class.
		Teacher monitors group progress and offers hints as necessary.

Consolidate Debrief 10 minutes	Teacher reviews findings and addresses the misconceptions identified during the activity	