NAME _____ DATE _____

Scenario

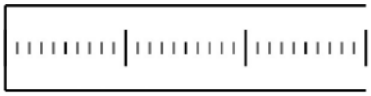
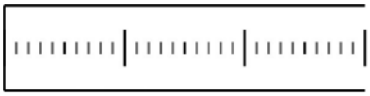
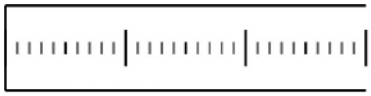
Consider a pipe that is 3 m long in a gas where the speed of sound is 360 m/s. Determine the longest three wavelengths and lowest three frequencies that resonate a standing sound wave in the pipe in the following two cases. For each part, first draw the standing waveform inside the pipe (as precisely as possible). Then explain how the wavelength and frequency were found.

Using Representations

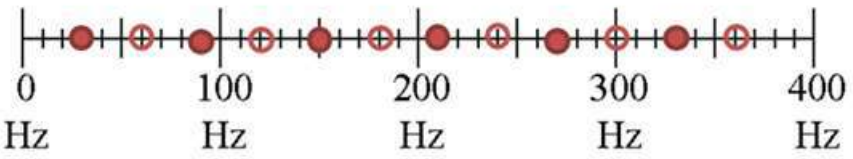
PART A: The pipe is open at both ends.

Lowest frequency, longest wavelength	Second frequency, second wavelength	Third frequency, third wavelength
		

PART B: The pipe is closed at its left end.

Lowest frequency, longest wavelength	Second frequency, second wavelength	Third frequency, third wavelength
		

PART C: On the number line below, draw an open circle ○ at each open-pipe frequency you found in Part A. Then use the pattern to get three more open-pipe frequencies. Then draw a closed circle ● at each closed-pipe frequency you found in Part B and use the pattern to get three more closed-pipe frequencies. List the additional frequencies below.



Three more open-pipe frequencies: _____, _____, _____.

Three more closed-pipe frequencies: _____, _____, _____.