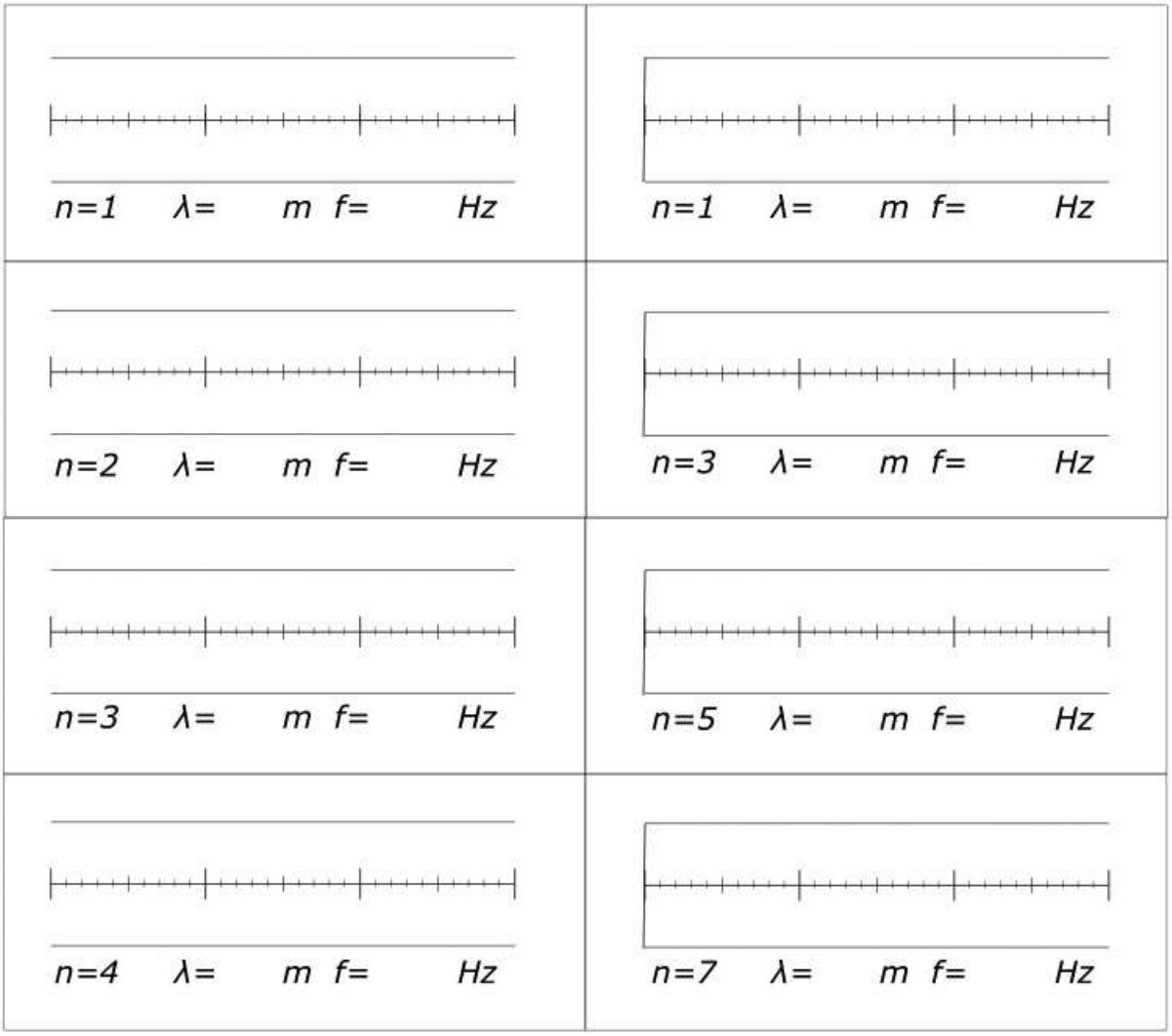
NAME _____ DATE _____

Scenario

The diagrams below show eight tubes that are 3.0 m *long. The four tubes on the left are open at both ends. The tubes on the right are open only on the right end. The speed of sound in the room where the tubes are kept is* 340 m/s.

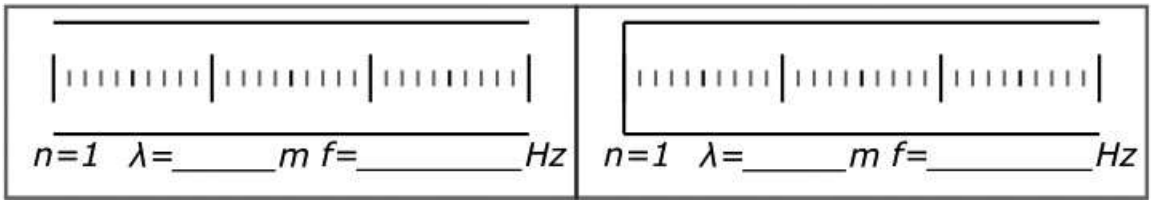
Using Representations

PART A: Draw the transverse representation of displacement wave that vibrates with the harmonic indicated. The speed of sound is 340 m/s. Then indicate the wavelength and frequency of each wave.



PART B: How did you decide where to put the nodes and antinodes? Explain.

PART C: How do sketches of displacement waves differ from sketches of pressure waves? Sketch a ***pressure wave*** for the first harmonic for each tube and use the sketches to explain the differences between pressure and displacement waves.



PART D: A pipe, similar to those above, when capped at one end resonates with a fundamental frequency of 100 Hz. If the cap is removed (not changing the length of the pipe), what is its new fundamental frequency? Sketch the fundamental for the pipe with and without the cap. Explain your reasoning.