**Waves and SHM: Resonance in Pipes**

/5

**Make sure to INCLUDE UNITS!**

1. A tuning fork was held over a tube, ***open at one end only***. The length of the tube was slowly increased until resonance was heard. If the first resonance was detected when the tube was 15 cm long, what length will give the next resonance? ***Justify you answer with a brief statement.***

(A) 30 cm (B) 45 cm (C) 60 cm (D) 75 cm

1. An empty pop bottle is to be used as a musical instrument in a band. In order to be tuned properly the fundamental frequency of the bottle must be 440.0 Hz. If the bottle is 0.260 m tall, how high should it be filled with water to produce the desired frequency if the speed of sound in air is 343 m/s?

Answers:

1. A tuning fork was held over a tube, ***open at one end only***. The length of the tube was slowly increased until resonance was heard. If the first resonance was detected when the tube was 15 cm long, what length will give the next resonance? ***Justify you answer with a brief statement.***
2. 30 cm (B) 45 cm (C) 60 cm (D) 75 cm

*First harmonic 1/4λ = L, for the third harmonic 3/4λ = L.*



1. An empty pop bottle is to be used as a musical instrument in a band. In order to be tuned properly the fundamental frequency of the bottle must be 440.0Hz. If the bottle is 0.260 m tall, how high should it be filled with water to produce the desired frequency if the speed of sound in air is 343 m/s?

Open-closed pipe:



