

## Question #259

Shown in the photograph below is an open tube about 50 cm long. If you blow at an angle into one end of the tube you can make a sort of musical tone.



Click your mouse on the photograph above to hear the fundamental frequency of the tube on an mpeg video.

Shown in the photographs below are (top to bottom) a closed tube the same length as the original tube, an open tube with half the length of the original tube, and a closed tube with half the length of the original tube.



What is the relationship of fundamental frequency of each of the three tubes above to the frequency of the original tube?

Case (a): Relative to the original tube, the frequency of tube (a) is:

- (a) higher in frequency by a factor of two.
- (b) lower in frequency by a factor of two.
- (c) the same frequency.

Case (b): Relative to the original tube, the frequency of tube (b) is:

- (a) one octave higher.
- (b) one octave lower.
- (c) the same frequency.

Case (c): Relative to the original tube, the frequency of tube (c) is:

- (a) one octave lower.
- (b) two octaves lower.
- (c) the same frequency.

Click here for [Answer #259](#) after October 16, 2006.

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[Question of the Week](#)

[Outreach Index Page](#)

[Lecture-Demonstration Home Page](#)



For questions and comments regarding the *Question of the Week* contact [Dr. Richard E. Berg](#) by e-mail or using phone number or regular mail address given on the [Lecture-Demonstration Home Page](#).