The day's assignment

Comprehension questions thus far

1. Suppose you encounter a periodic sound signal with period (i.e., peak-to-peak distance) 0.009525 s.
   (a) What is the fundamental frequency?
   (b) What other frequencies may be present in this periodic sound?
   (c) For what types of instruments should you expect them all to be present? Are there any instruments for which some of these frequencies are not expected?
   (d) If we wish to have a recipe for reconstructing the sound from its frequencies—that is, wish to know the frequency spectrum for the sound, its timbre—what tool do we have to achieve this?
2. What is the difference between an overtone and a harmonic?
3. What is the problem with the 7th harmonic?
4. What is the relationship between
   (a) A4 and A6?
   (b) A4 and E5?

   Use Kung's "many perspectives" approach to answer this question in more than one way.
5. What is the definition of consonance? Does it seem like A4 and E5 exhibit it? Write out the first 5 harmonics for both and compare them.

A task to do individually

Use playFreqsTogether.m to create your own instance of the "missing fundamental" auditory illusion. Send me an email message with your function call. To add to the challenge, try to make your sound as much like that of a particular musical instrument—a violin, clarinet, etc.—as possible. That is, go for replicating the timbre of one of these instruments. Indicate in your message which instrument you are trying to imitate.

Get out in front?

Read Chapter 4 of the Benson text, "Music: A Mathematical Offering" and answer the questions in Room SCOFIELD3894 at socrative.com. These questions will remain open through Thurs. am.