Section 9.3: Beats
Mini Investigation: Wave Beat Demonstration, page 428
A. The beat pattern emerges when two waves of similar but slightly different frequencies overlap. One wave is the graph the program is trying to draw and the other wave is the location of the pixels of the computer screen.

Mini Investigation: Creating Beats, page 428
Answers may vary. Sample answers:
A. I think the waveform produced in Step 5 is a beat because it is the result of the interference of two sound waves.
B. No, I do not think the beat pattern would change if I tapped the tuning forks at different times because they would still emit the same sound waves with the same amplitude and frequency.

Research This: Humming Fish, page 429
A. The frequency of the males' humming is in the range of 90 Hz to 100 Hz.
B. Answers may vary. Sample answer:
I thought the humming sounded like a distant airplane.
C. The females are attracted to humming with a frequency of 100 Hz. So, when they encounter an acoustic beat of two or more males humming, the females' brains can isolate the overlapping sound waves and swim to the male with the better frequency.

Section 9.3 Questions, page 429
1. Answers may vary. Sample answer:
When waves in the same medium interact, they interfere with each other according to the principle of superposition. At times, the waves are in phase, and constructive interference occurs. At other times, waves are out of phase, and destructive interference occurs. These changes in phase produce a change in loudness, which is the beat.
2. You should loosen the string. To tune the guitar correctly, the beats should not be audible which means the beat frequency should be zero.
3. The sound waves produced by two engines probably have similar amplitudes but different frequencies. As the sound waves move in and out of phase, a change in loudness, or acoustic beat, arises.
4.