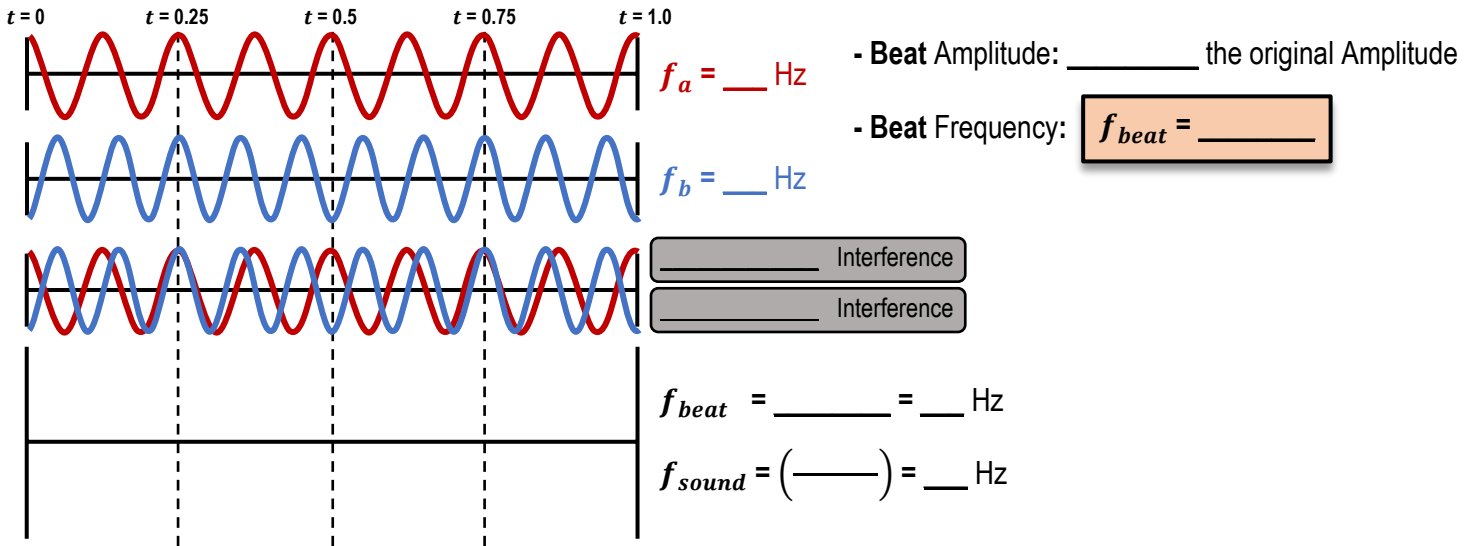


## CONCEPT: BEATS

- **Beats** are oscillations in Amplitude that occur when 2 sound waves with \_\_\_\_\_ frequencies interfere.
  - The **beat frequency** is the # of oscillations or # of Amplitudes you hear per second.



- The resulting sound you hear has a frequency (pitch) of  $f_{sound} = \left( \frac{f_a + f_b}{2} \right)$ , but the *Amplitude* (loudness) varies at  $f_{beat}$ .

**EXAMPLE:** Two musicians try to play the same note, which has a wavelength of 65cm, at the same time. Sadly, one of the instruments is out of tune and plays a note with a wavelength of 65.4cm. What is the frequency of the beats the musicians hear? Assume the speed of sound is 343 m/s.