Act 1 - Solution

The speed of sound in air is a bit over **300 m/s**, and the speed of light in air is about **300,000,000 m/s**.

Suppose we make a sound wave and a light wave that both have a wavelength of **3 meters**.

1. What is the ratio of the frequency of the light wave to that of the sound wave?

(a) About **1,000,000**   (b) About **0.000001**   (c) About **1000**

$$f = \frac{v}{\lambda} \quad \text{and} \quad \frac{v_{light}}{v_{sound}} \cong 1,000,000 \quad \Rightarrow \quad \frac{f_{light}}{f_{sound}} \cong 1,000,000$$