

CONCEPTUAL PHYSICS**Demonstration**

26.1 Sound: The Tuning Fork

SLOW-MOTION WOBBLER**Purpose**

In this activity, you will observe and explore the oscillation of a tuning fork.

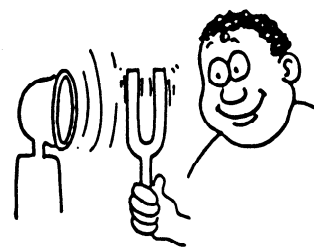
Required Equipment and Supplies

low-frequency tuning forks (40–150 Hz forks work best for large amplitudes)

bright strobe light with a widely variable frequency (an inexpensive, party strobe light *won't* do)

Discussion

The tines of a tuning fork oscillate at a very precise frequency. That's why musicians use them to tune instruments. In this activity, you will investigate their motion with a special illumination system—a *stroboscope*.

**Procedure**

Strike a tuning fork with a mallet or the heel of your shoe (do *not* strike against the table or other hard object). Does it appear to vibrate? Try it again, this time dipping the tip of the tines just below the surface of water in a beaker. What do you observe?

Now dim the room lights and strike a tuning fork while it is illuminated with a strobe light. For best effect, use the tuning fork with the longest tines available. Adjust the frequency of the strobe so that the tines of the tuning fork appear to be stationary. Then carefully adjust the strobe so that the tines slowly move back and forth. Describe your observations.

Summing Up

1. What happens to the air next to the tines as they oscillate?

2. Strike a tuning fork and observe how long it vibrates. Repeat, placing the handle against the tabletop or counter. Although the sound is louder, does the *time* the fork vibrates increase or decrease? Explain.

3. What would happen if you struck the tuning fork in outer space?

