

Doppler Effect

Teacher's Notes

Main Topic	Sound
Subtopic	Doppler Effect
Learning Level	High
Technology Level	Low
Activity Type	Student/Demo

Description: Observe and analyze the Doppler effect with a simple apparatus.

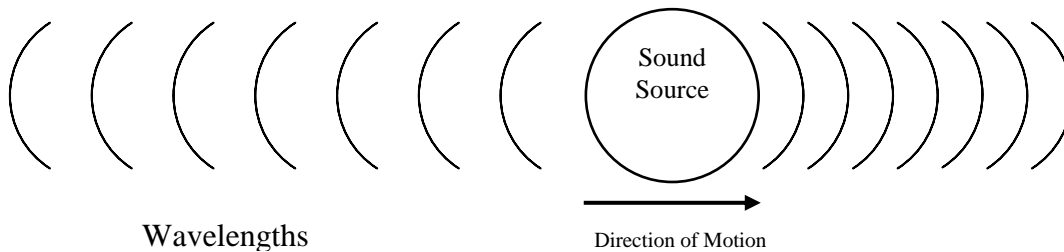
Required Equipment	Doppler Ball, String
Optional Equipment	Audioscope Software

Educational Objectives

- Observe the Doppler effect with sound, and explain it using waves.

Concept Overview

The Doppler Effect occurs when an observer hears a sound from a moving source. If the sound source is moving toward the observer, the perceived frequency will be higher than the actual sound frequency. If the source is moving away from the observer, the perceived frequency will be lower.



Lab Tips

Snap the battery connection onto the 9V battery (included) to start the buzzer. Push the buzzer into the ball.

Use Audioscope or another sound analysis program to graph the frequency of the sound. With the microphone at arm's length, push the buzzer toward and away from the microphone. Observe how the measured frequency varies.

Doppler Effect

Name: _____

Class: _____

Goal:

Observe and explain the Doppler effect.

Materials:

Doppler Ball, String.

Procedure:

1. Start the buzzer and observe its pitch. Play catch. Throw the ball fast, and without spin. Describe the pitch of the sound you hear when the ball is going away from you, and when it is coming toward you.
2. Tie a string tightly around the ball. Swing it in a circle above your head. Take turns listening to the buzzer from several feet away. Describe your observations.
3. The first diagram below shows a stationary ball emitting sound waves. Draw another identical ball moving to the right. Show how the sound waves would appear to stationary observers.

