

33000 Doppler Demonstrator

Purpose:

This device is designed to demonstrate the change in pitch produced by a constant frequency emitted from a moving source or a moving receiver.

Required Accessories:

One (1) Battery, 9V
A Recording Device

Procedure:

1) Suspend the device from the ceiling, a doorway or other convenient location. Insert a 9V battery into the battery holder. The device should automatically activate when battery is inserted.

Note: The longer the string, the more evident the change in pitch will be.

2) Set the buzzer into a simple pendulum swing. The pitch will alternate from high to low. Distinguish between changes in pitch and changes in loudness.

3) Keep the buzzer stationary and swing a recording device (microphone or small tape recorder) in a simple pendulum motion in front of it. Play the recording to hear how the same effect by a moving sound source is produced by a stationary sound source.

Discussion Questions:

- 1) When the Doppler device is in motion, does the wavelength change. Does the pitch change?
- 2) Can you identify, just by listening, when motion is toward and when it is away?
- 3) Imagine that you are swinging with the Doppler device. Would you hear a change in pitch?
- 4) How does the Doppler effect apply to starlight?
- 5) Be prepared to explain student perceptions based on reflections in the room, other sources, etc.

Time Allocation:

To prepare this product for an experimental trial should take less than two minutes. Actual experiments will vary with needs of students and the method of instruction, but are easily concluded within one class period.

Feedback:

If you have a question, a comment, or a suggestion that would improve this product, you may call our toll free number below.