

Doppler Effect

Listen to a car engine going past you. Or better yet, listen to the sounds of an ambulance siren as it goes by. The sounds seem to change from high to low as it passes by you. In the 1800's, an Austrian mathematician named Christian Doppler figured out why moving sounds change depending on the position of the listener. Here's your chance to check out the "Doppler Effect" for yourself and see how time flies!

Materials:

1. A friend
2. Two meter length of string
3. A digital watch with an alarm

What's Happening:

When you swing the watch around, the watch stays about the same distance from your ears all the time, so its sound waves reach your ears at the same time. But when you stand back as your friend whirls the watch around, the beeping watch moves away from you, then towards you. When the watch comes closer, the sound waves bunch together, so more waves get to your ear each second. This makes the pitch of the sound go up. As the watch swings away from you, the sound waves stretch out, making them sound lower in pitch. The speed of the sound waves is the same coming and going, but the frequency or pitch changes. Your hearing the Doppler Effect!

What to do:

1. find an open space outside
2. Tie the watchband to the end of the cord. Set off the alarm on the watch.
3. Have your friend hold the watch and walk away from you, with you holding the end of the string. Now, have them set the watch down and take a few more steps away from you. This way they are further from you than the watch.
4. Pull the watch back to you. When the alarm goes off, pull the string in to get it started, then whirl it around your head. Gradually let the string out until it's at its full length.
5. What did you hear? What did your friend hear?
Very Important Don't let go of the whirling string— you'll send the watch flying
6. Now switch places with your friend and repeat the whole thing. Do you anything different?