

Doppler Effect Experiment

On SCOPE's Emergency Science episode, Lindsay performed an experiment to demonstrate the Doppler effect. Here's how you can try it at home!

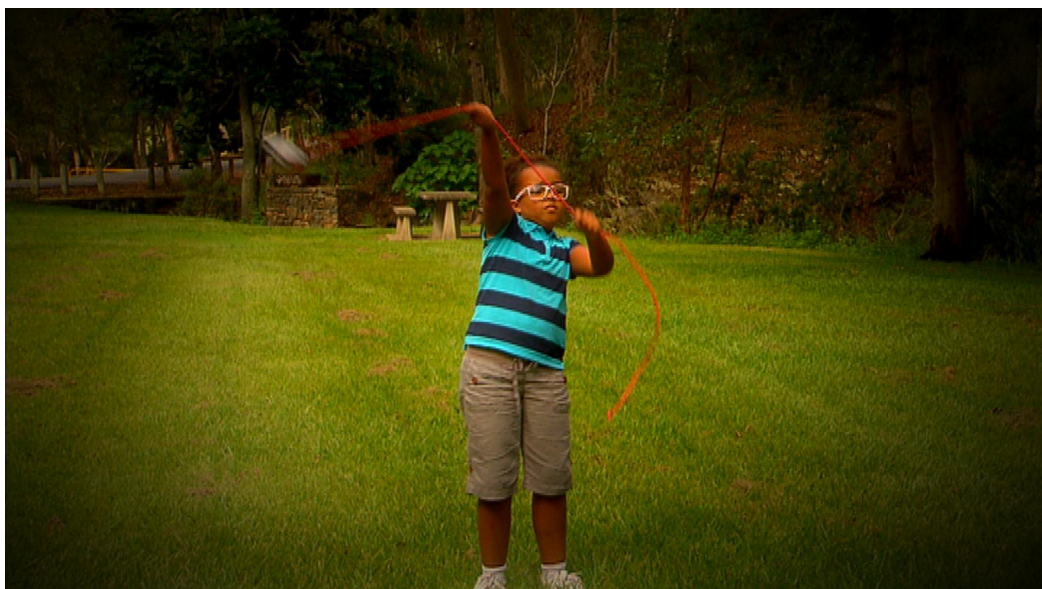


What you need:

- A small alarm clock
- Some strong tape, such as gaffe tape
- A rope
- An observer (someone to listen to the Doppler effect as you do the demonstration!)

What to do:

1. Set the alarm on the clock to go off in a reasonably short time
2. Tape the rope tightly around the alarm using lots of tape
3. Walk away from the observer to a safe distance to swing the alarm clock
4. Wait for the alarm to go off
5. When the alarm is sounding, swing the alarm around your head using the rope
6. The observer should hear the pitch or frequency of the sound change, even though the alarm is making the same sound. This is because of the Doppler effect. Depending on how you swing the alarm, you may also be able to hear this effect as the alarm moves towards and away from your ears.



What's happening:

As the alarm clock swings around, it actually changes the frequency of the sound waves, even though the sound coming out of the clock stays the same. As the clock travels towards the observer, the sound waves get closer together as the clock is moving towards the waves it has already produced. This makes a higher-pitched sound.

As the clock travels away from the observer the sound waves get further apart as the clock is moving away from the waves it has already made. This makes a lower-pitched sound. You can hear the Doppler effect when sirens, like those on emergency vehicles, move past you. When an ambulance is travelling towards you the siren will sound higher than when it is travelling away from you and the sound becomes lower. This is due to the Doppler effect.

