SUITE SCIENCE

Doppler Shift!

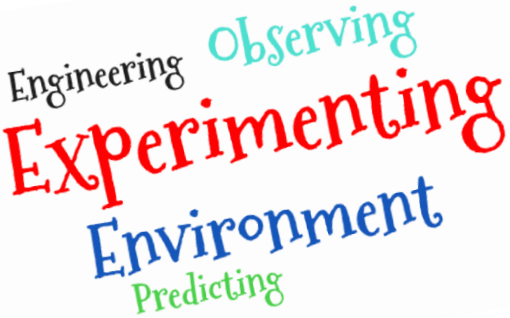
CLASS: 4th- 6th | Demonstration or Experiment 15mins | SESE

Learning Objectives - WALT (We are learning to…)

1. Explore sound and Doppler Shift
2. Observe the effect happening every day in real life.

Curriculum links
Science

- Stand – Energy & Forces, Sound
- Explore how sound travels through materials



Teaching Methodologies

- **Talk and Discussion** - listening, questioning
- **Collaborative/Cooperative Learning** - group work
- **Active Learning** – Hands on learning experience with real life examples.
- **Skills through Content:** observing, predicting, describing, recording, classifying.

That's sound!

Sound is made up of vibrations. These are called sound waves and they are what we hear.
These sound waves are formed by objects shaking back and forth. They travel through air, water, and solid objects as vibrations. When they reach our ears, these waves make our eardrums vibrate. This sends signals to the brain and it figures out what we're listening to.

When a something that is making a sound moves in relation to you, its pitch changes. Pitch can be fast or slow, so it depends on speed with typically high pitch being fast and low pitch being slow. From hearing the doppler effect you can determine whether the source is moving toward or away from you, and by researching more, you also can estimate how fast it's going.

How do you doppler?

For this investigation you'll need something that makes a consistent sound and a piece of strong string. This could be a buzzer or similar but whatever you're using, you need to be careful to 1. Not let go 2. Have the rope secured safely and 3. Not whack into anything when swinging. Maybe try it outside ☺

Once you're happy and you give your apparatus an auld swing, you'll observe that when the buzzer or sound source is moving towards you, in effect, it is catching up slightly with its own sound waves. With each sound of the buzzer, the source is a little closer to you. The result is that the waves are squeezed together, and more of them reach your ear each second than if the buzzer were standing still. Therefore, the pitch of the buzzer sounds higher.

So, what do you think will happen with the buzzer is moving away from you? Are the waves getting closer together or further apart and what does that do to how the sound appears to you?

Have a think or even try it out!

Question!

Where else do you observe this in real life? Do ambulances always change the sound of their siren just as they pass you? Or is it a little bit of science?

REFER BACK TO YOUR WALT GOALS AND HAVE THE CHILDREN SHARE WHAT THEY LEARNED TODAY AS WELL AS RECAPPING ON ANYTHING THEY MISSED!

Fondúireacht Eolaíochta Éireann
Dá bhfuil romhainn
Science Foundation Ireland
For what's next

UCD DUBLIN

Insight
SFI RESEARCH CENTRE FOR DATA ANALYTICS