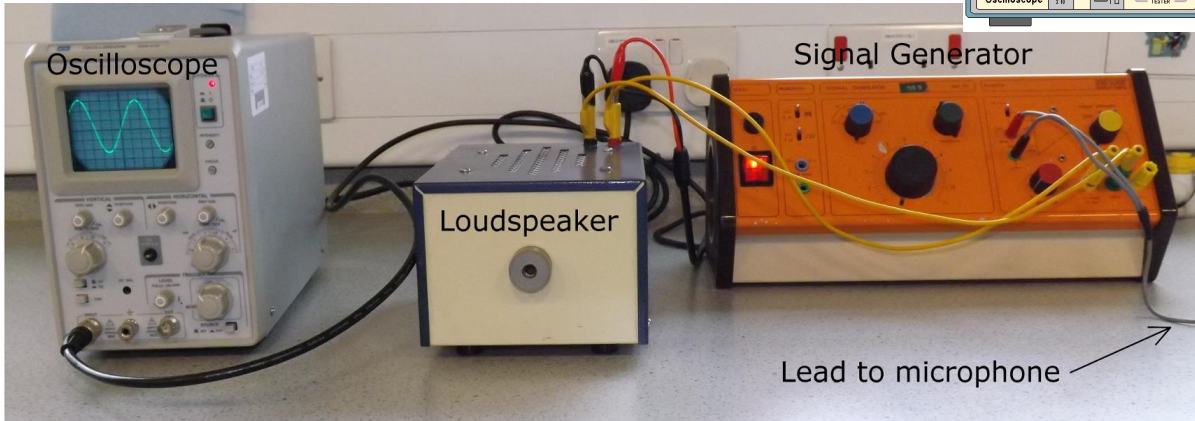
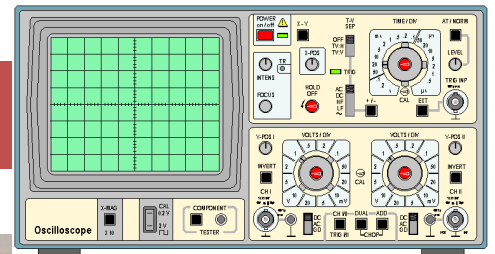


Oscilloscope Traces.



Copy

An oscilloscope is a type of electronic test instrument that graphically displays varying signal voltages. (shows a graph of the change in voltage)

It can be used to display sound signals after they've been converted to an electrical signal by a microphone. The longitudinal sound waves are converted to transverse waves and displayed on a screen.

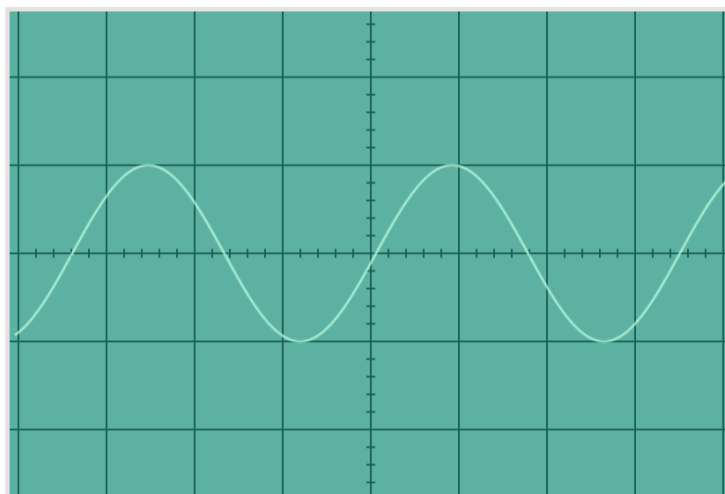
The energy change would be

Sound \Rightarrow electrical \Rightarrow light

As we can't currently do the practical you can try it for yourself.

Academo

<https://academo.org/demos/virtual-oscilloscope/>



Start by setting the input to a sine wave.

Change the frequency and record what happens to the trace.

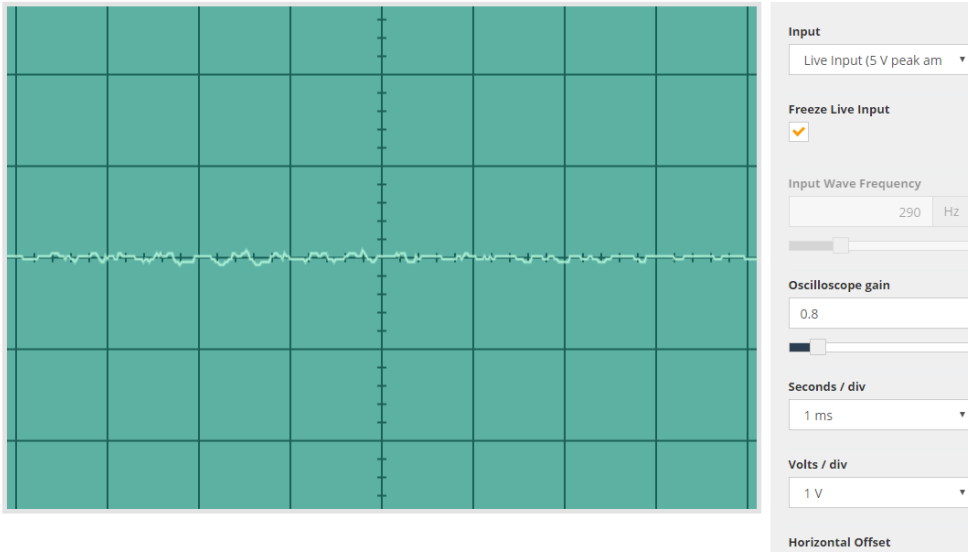
The gain acts like an amplifier for louder sounds.

Leave the seconds/div button.

Volts/div changes the sensitivity.

Now on the sheet below (print it out or use your jotter) draw the traces on the worksheet.

Then change the Input to LIVE INPUT (5V peak max) and see what happens to the trace on the oscilloscope. You might need to change the



Complete the worksheet below

Using the grids on the other side of the page draw the patterns for the following sounds.

All diagrams should be drawn using the original pattern as the starting point.

1. A higher frequency with a quieter sound.
2. A louder sound with lower pitch.
3. A note of the same pitch which is louder.
4. A note of one octave higher with the same loudness.

Phet Colorado Physics

<https://phet.colorado.edu/en/simulation/legacy/sound>

Set this demo to LISTEN TO SINGLE SOURCE

Set the Audio Control to Speaker

Adjust the frequency and look what happens to the wavelength of the waves

Adjust the amplitude and see what happens to the movement of the loudspeaker

Virtual Int 1 (available on TEAMS only) Ask your Physics Teacher if you live in Scotland

DON'T OPEN THE FOLDER, BUT OPEN THE DIAMOND, Open the SOUND and MUSIC section

Name	Date modified	Type
Electronics	24/04/2004 11:04	Application
Movement	24/04/2004 11:03	Application
Practical Electricity	24/04/2004 11:04	Application
Radiations	24/04/2004 11:02	Application
ReadMe	25/04/2004 00:32	HTML Docume
Revision	24/04/2004 10:44	Application
Sound and Music	24/04/2004 10:43	Application
Telecommunications	24/04/2004 10:41	Application

Virtual Int 1 Physics

When you see this sign switch on your sound

Turn on your sound

Read the introduction Section.

Go through the Frequency and Pitch section

Next do the Oscilloscope Traces

Finally look at what an octave is for a Physicist. Brilliant isn't it!.

Interactive summary

Slide whistles and air columns

Guitar and strings

Oscilloscope traces

Introduction

Frequency and pitch

Octaves

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Virtual Int 1 Physics

Frequency and pitch

The frequency of a sound is the number of waves produced in one second.
 Frequency is measured in hertz (Hz).
 How high a note sounds is called the pitch.
 Increase the frequency of the sound. What happens to the pitch? **It increases.**

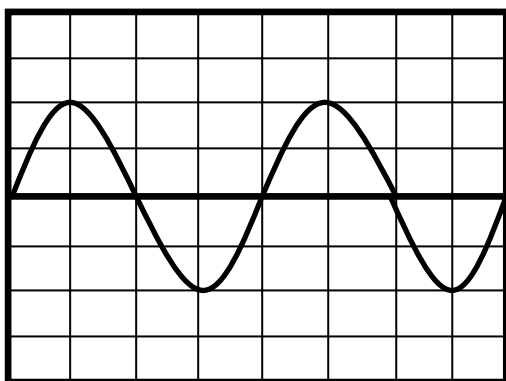
Frequency meter: 200 hertz

signal generator: 200 Hz

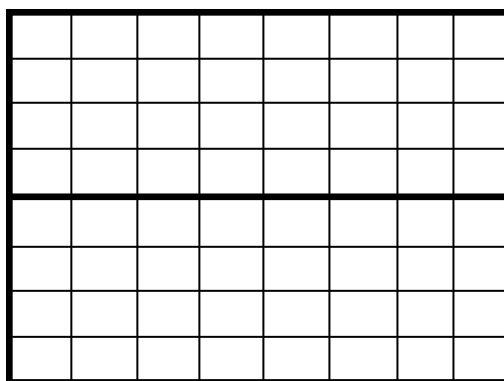
loudspeaker

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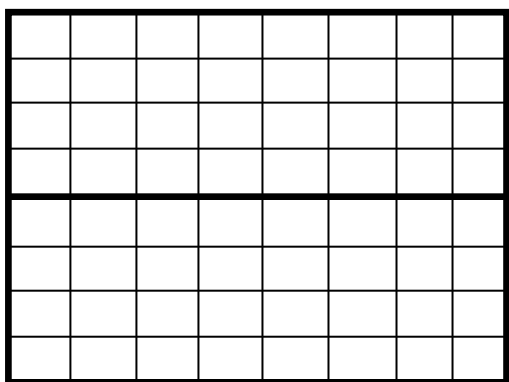
Looking At Sound Waves Worksheet



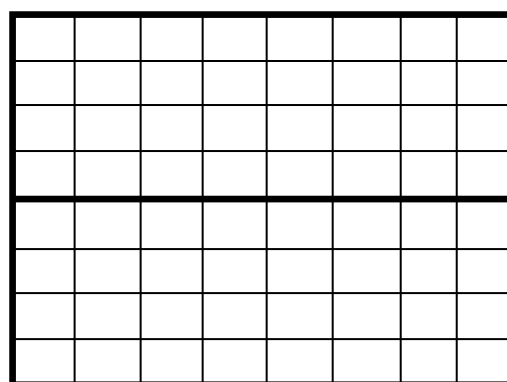
Normal Sound Wave



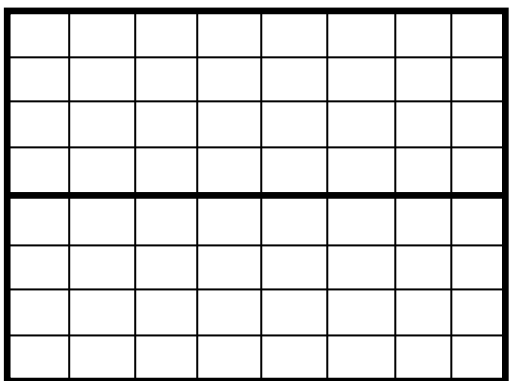
Waves an octave apart



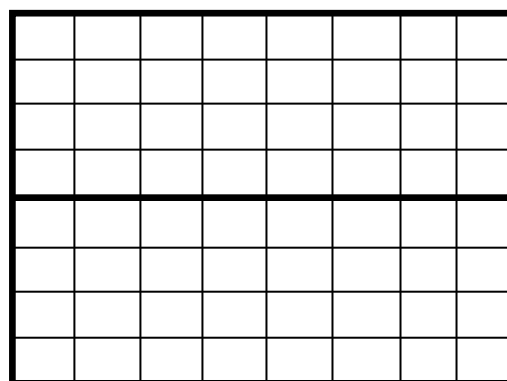
Higher Volume, Same Pitch



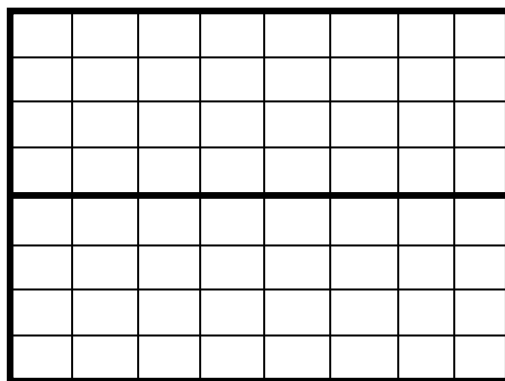
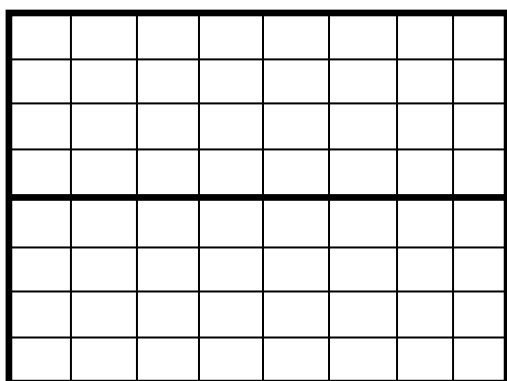
Lower Volume, Same Pitch



Same Volume, Higher Pitch

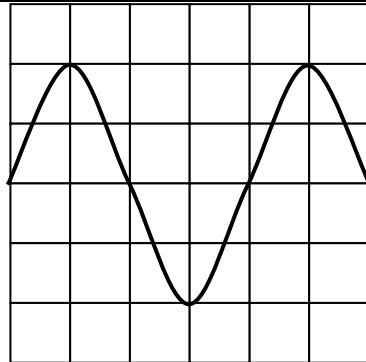


Same Volume, Lower Pitch

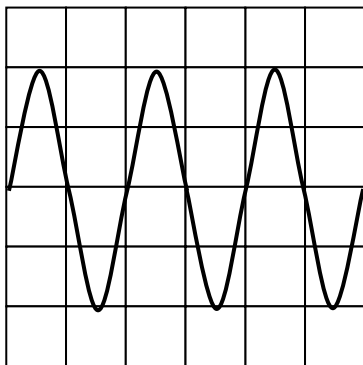


sound and patterns sheet

Original Pattern

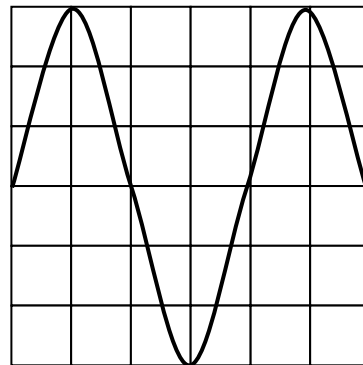


Pattern A



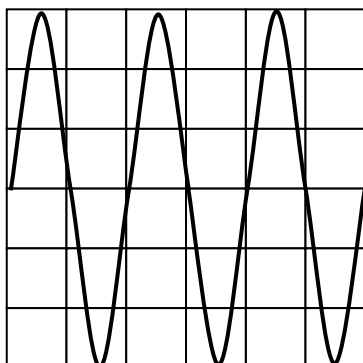
Pattern A Represents a sound with _____ frequency and _____ loudness.

Pattern B



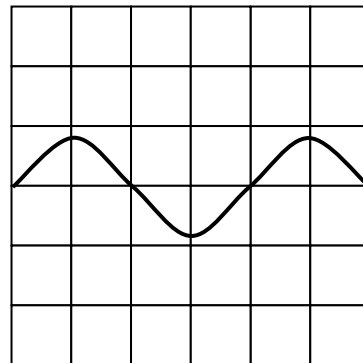
Pattern B Represents a sound with _____ frequency and _____ loudness.

Pattern C



Pattern C Represents a sound with _____ frequency and _____ loudness.

Pattern D



Pattern D Represents a sound with _____ frequency and _____ loudness.

I'll post the answers up next week! Don't cheat but check them off when you've done the work. Please contact me via the website or GLOW for assistance.

There is graph paper on mrsphysics if you need it

<https://www.mrsphysics.co.uk/advanced/wp-content/uploads/2016/06/multiwidth-graph-grey.pdf>