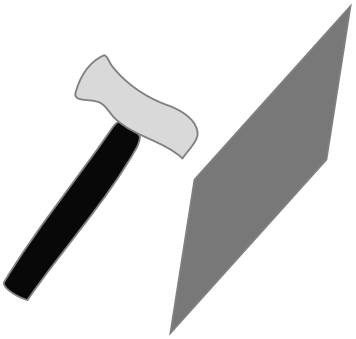
Speed of sound

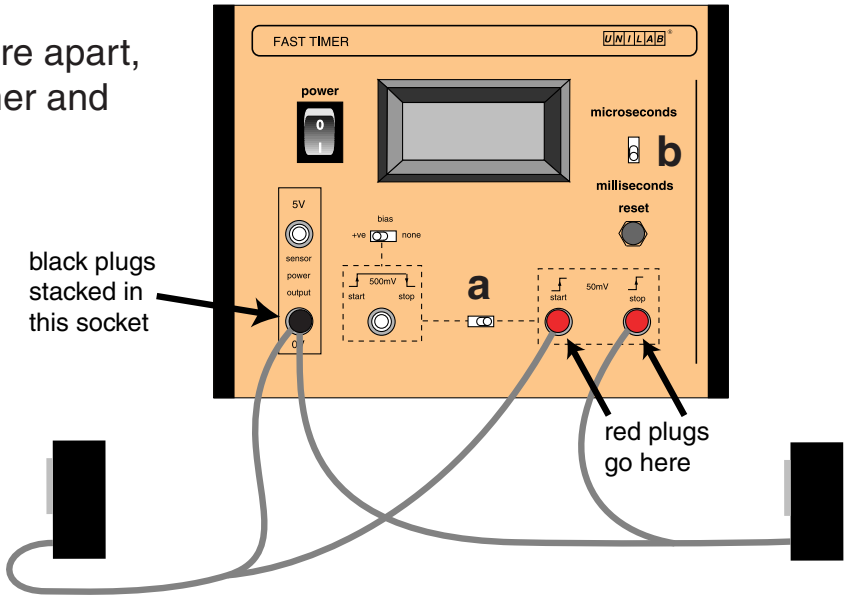
The Fast Timer does just what its name suggests!
It detects events, such as switches changing or light gates being interrupted, or in this case . . loud sounds captured by microphones.
Times can be measured in milliseconds (0.001s) or microseconds (0.000001s).

So let's do the speed of sound in air . . .
Connect the microphones to the sockets shown. Switch on the Fast Timer.
Check switch **a** is set to the right, and switch **b** is set to milliseconds.

Check that the microphones are 1 metre apart, and both are facing towards the hammer and steel plate.

Press **reset.**





Lift the steel plate off the table and strike it sharply with the hammer.

Check the time on the display. Press **reset** and repeat.
This is the time, t , in milliseconds, that sound takes to travel 1 metre.

Do the simple calculation 1000 divided by the time, t
This is the speed of sound in metres per second.

. . . and now in the table top
Ask someone to gently press the two microphones, face down, to the table top.
Check that they are 1 metre apart. Press **reset** on the Fast Timer.

Now hold the steel plate firmly on the table and strike it with the hammer.
You might need to set the Fast Timer to microseconds, to get a more accurate result.

The time is much shorter. Sound travels faster in solids (and liquids) than in air.
Can you calculate the speed of sound in the table top?

Another possibility
If you had two plastic bags and an aquarium, you measure the speed of sound in water!