

Experiment 4:

Frequency of sound

A biologist wishes to investigate how bats navigate around obstacles at night. One way of doing this is to monitor the high frequency sound waves generated by the bats. The biologist decides to use a microphone and some recording equipment.

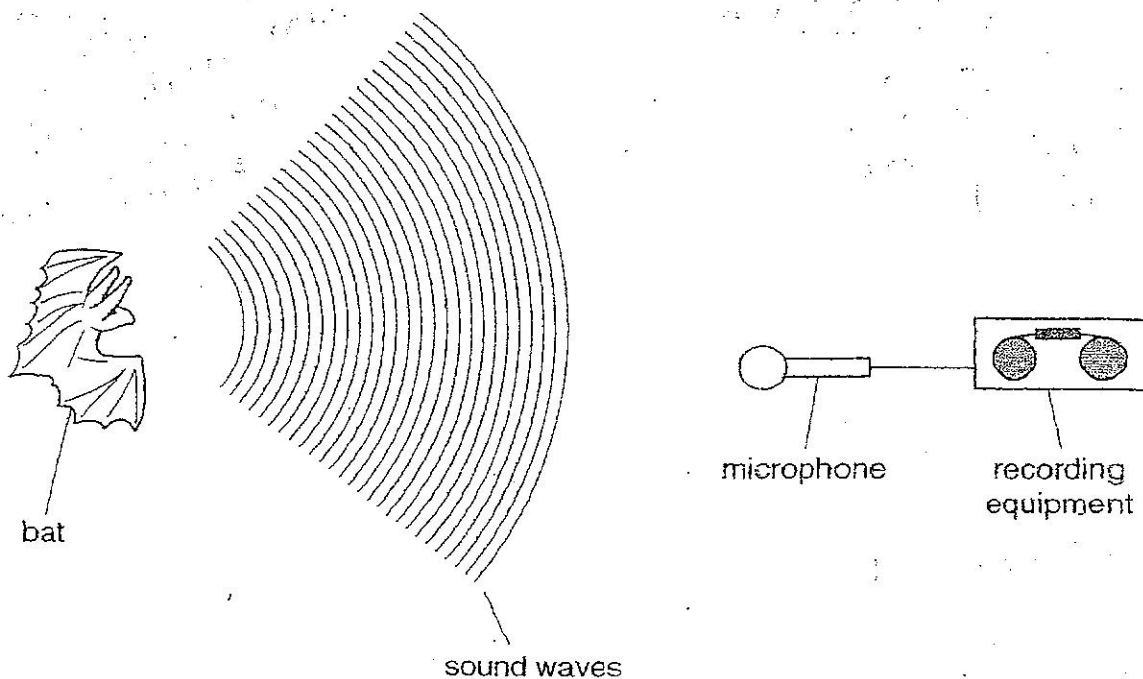


Fig. 3.1

However, the recording equipment fails to register any signals. It is suspected that the frequency response of the microphone does not match the frequency of the sound waves given out by the bats.

Design an experiment to investigate how the output of a microphone varies with the frequency of the sound waves which it receives. You may assume that the following apparatus is available:

Loudspeaker

Cathode ray oscilloscope (with accurately calibrated timebase)

Microphone

Connecting wires

In addition to the apparatus listed above, a signal generator is available. However, the scale of this generator is unreliable and cannot be used to give an indication of frequency. No other signal generator is available.

Any other standard equipment (which may be found in a school or college science laboratory) can be used.

In your account you should pay particular attention to:

- the procedure to be followed,
- how the magnitude of the output signal from the microphone may be measured,
- how the frequency of the signal may be determined,
- precautions taken and control of variables.