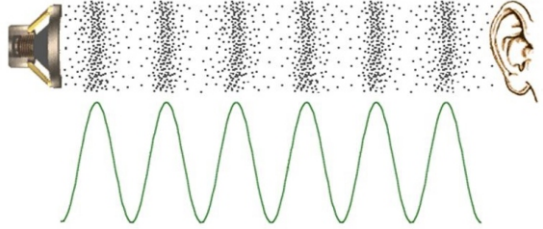


EXPLAIN

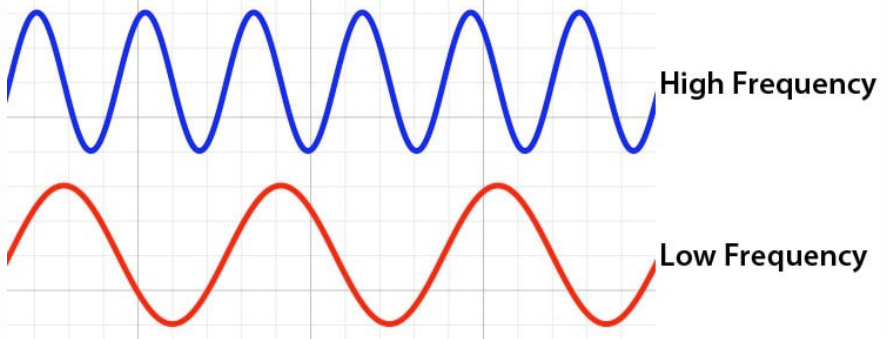
1. Sound is produced when something vibrates. Vibration is nothing but a to and fro motion (oscillation) at a very high speed.

2. Sound travels in the form of waves. Sound is actually pressure waves created by a vibrating body. When an object vibrates at a very high speed, it can compress and decompress the air near itself. This compression travels like a wave through the air to our ears and we finally hear this as “sound”.

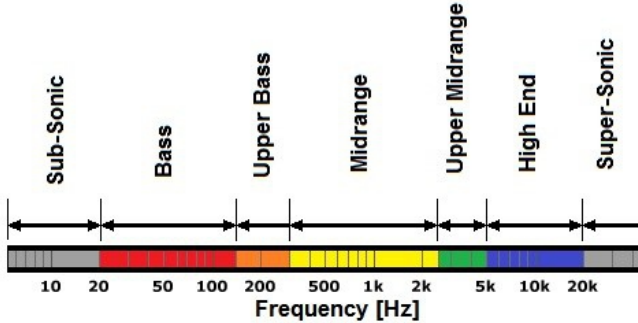


3. But do all vibrations produce a sound? The answer is no. For example, when we shake our body, it is also a form of vibration. But it does not produce any sound. This is because the speed of the vibration is very slow. This “speed” of the vibration is termed as **frequency**. An object has to vibrate with a certain frequency to produce a sound.

4. Frequency is defined as the number of complete vibrations occurring in one second. It is measured in cycles per second or **hertz** (Hz). Humans can normally hear sounds in the range of 20 Hz to 20,000 Hertz i.e. 20,000 vibrations per second.



5. The frequency determines the pitch of a sound. Pitch is nothing but how “high” or “low” a sound is. The greater the frequency, the higher the pitch of the sound.



Audio Spectrum

6. For example, when we increase the bass in a music system, the frequency of the sound is lower and it produces a shrill and bold sound (like the thick string of a guitar), whereas when the bass is low, it produces a shriek or a higher frequency sound (like the thin string of a guitar).

7. The mechanical vibrations that can be interpreted as sound are able to travel through all forms of matter - gases, liquids, solids, and plasmas. Sound needs a medium to travel. If there is no medium or matter (vacuum), sound cannot travel. Sound propagates through compressible media such as air, water and solids as longitudinal waves and also as transverse waves in solids.

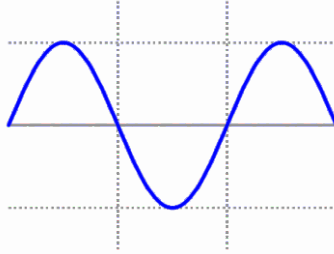


Sound travels fastest through solids where molecules are packed tightly together.

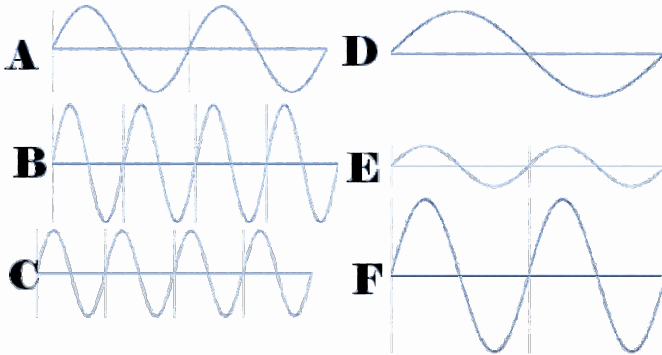
Sound can't travel through empty space where there are no molecules to vibrate.

EVALUATE

1. Label the crest, trough, wavelength and amplitude in the sound wave diagram given below.

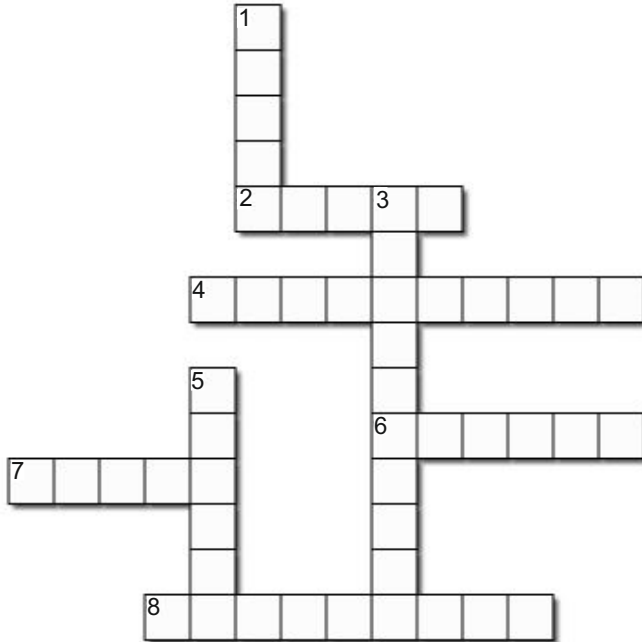


2. Look at the wave diagrams below and answer the following questions.



- i. Which sounds have a higher frequency than A?
- ii. Which sounds have a lower frequency than A?
- iii. Which sounds have the same pitch?
- iv. Which sounds are louder than A?
- v. Which sound has a higher pitch than A, but is at the same volume?
.....
- vi. How would sound D compare to sound A?
.....
- vii. How would sound F compare to sound A?
.....

3. Solve the given crossword.



<u>Across</u>	<u>Down</u>
2. The unit of frequency.	1. The lower the frequency, the lower the of the sound.
4. Sound is produced due to	3. Sound can travel in the form of..... waves through solids.
6. Sound cannot travel through a	5. Sound travels through solids than through air.
7. Sound travels in the form of	
8. is defined as the number of vibrations per second.	

