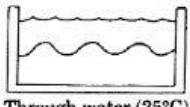


# Sound Waves

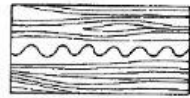
The Speed of Sound  
in different mediums

The **sound wave** is a series of compression and rarefaction areas traveling through a substance.



Through water (25°C)

6. \_\_\_\_\_



Through pine wood (25°C)

7. \_\_\_\_\_

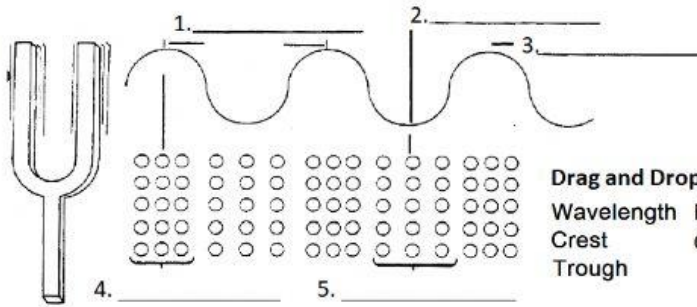


Through steel (25°C)

8. \_\_\_\_\_

Drag and drop  
the speeds

- 5,200 m/sec
- 1,497 m/sec
- 3,320 m/sec



Drag and Drop

- Wavelength
- Rarefaction
- Crest
- Compression
- Trough

Describe the relative spacing of molecules as they are affected by compression and rarefaction.

As energy moves through a medium, the particles move **parallel perpendicular** to the direction of the wave and are **tightest loosest** at the compressions and **tightest loosest** at the rarefactions.

Describe the motion of individual molecules. In a **transverse compressional** wave, the particles move up and down **parallel perpendicular** to the direction of the wave, in a **transverse compressional** wave the move back and forth **parallel perpendicular** to the direction of the wave.

Look at the speed of sound through these unknown substances and determine if the substances are solid, liquid, or gas.

- a. 1200 m/sec \_\_\_\_\_
- b. 259 m/sec \_\_\_\_\_
- c. 5000 m/sec \_\_\_\_\_
- d. 2680 m/sec \_\_\_\_\_

What is the speed of sound through air at these temperatures?

The speed of sound is 331.5 m/sec at 0 °C and increases .6 m/sec for each degree the temperature increases. We can put this in the **y = mx + b** line format like this:

$$\text{Speed} = .6 (\text{temperature}) + 331.5$$

Temp.	Speed	Drag and Drop to Graph the points
5°C	_____	●
15°C	_____	●
25°C	_____	●
35°C	_____	●
45°C	_____	●
55°C	_____	●
65°C	_____	●

Speed m/sec

370.5

367.5

364.5

361.5

358.5

355.5

352.5

349.5

346.5

343.5

340.5

337.5

334.5

5

15

25

35

45

55

65

Temperature °C