SOUND

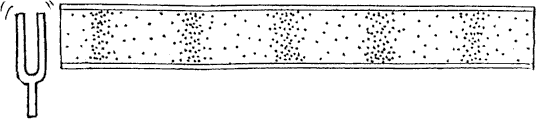
1. Two major classes of waves are longitudinal and transverse. Sound waves are

|  |  |
| --- | --- |
| longitudinal | transverse |

1. The frequency of a sound signal refers to how frequently the vibrations occur. A high-frequency sound is heard at a high

|  |  |  |
| --- | --- | --- |
| pitch | wavelength | speed |

The sketch below shows a snap shot of the compressions and rarefactions of the air in a tube as the sound moves toward the right. The dots represent molecules.

http://dev.physicslab.org/img/48749fce-9fd3-4b4a-83ec-3dd8ae509438.gif

1. Using the ruler provided, the wavelength of the sound wave is measured to be
2. Compared to the wavelengths of high-pitched sounds, the wavelengths of low-pitched sounds are

|  |  |
| --- | --- |
| long | short |

1. Sound waves travel fastest in

|  |  |  |  |
| --- | --- | --- | --- |
| solids | liquids | gases | ... the same speed in each |

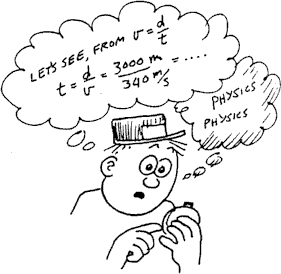
1. The accepted value for the speed of sound in air is 331 m/s at 0ºC. The speed of sound in air increases 0.6 m/s for each Celsius degree above zero. Compute the speed of sound at the

temperature of the room you are now in.

**Refer to the following information for the next two questions.**

Suppose you set your watch by the sound of the noon whistle from a factory 3 km away.



1. Compared to the correct time, your watch will be
2. It will differ from the correct time by

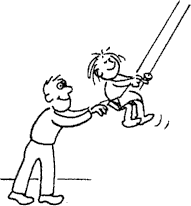
|  |  |  |
| --- | --- | --- |
| 3 seconds | 6 seconds | 9 seconds |

**Refer to the following information for the next four questions.**

Suppose a child's natural frequency of swinging is once each 4 seconds.

1. For maximum amplitude the man should push at a rate of once each

|  |  |  |
| --- | --- | --- |
| 2 seconds | 4 seconds | 8 seconds |

1. If the man in previous question pushes in the same direction twice as often, his pushes

|  |  |
| --- | --- |
| will be effective | will not be effective |

because

|  |
| --- |
| the swing will be pushed twice as often in the right direction |
| every other push will oppose the motion of the swing |

1. Based on this swing example, a 440 hz- tuning fork could NOT be forced into vibration by a sound of

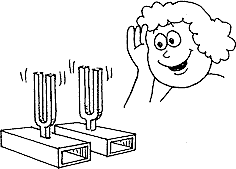
|  |  |  |
| --- | --- | --- |
| 220 hz | 440 hz | 880 hz |

**Refer to the following information for the next three questions.**

Two notes with frequencies of 66 and 70 hertz are "sounded together."

1. The resulting beat frequency is

|  |  |  |
| --- | --- | --- |
| 4 hertz | 68 hertz | 136 hertz |

at a pitch of

|  |  |  |
| --- | --- | --- |
| 4 hertz | 68 hertz | 136 hertz |

1. Beats are the result of the alternate cancellation and reinforcement of two sound waves of

|  |  |
| --- | --- |
| the same frequency | slightly different frequencies |