

The Nature of Sound Waves

Read from **Lesson 1** of the **Sound and Music** chapter at **The Physics Classroom**:

<http://www.physicsclassroom.com/Class/sound/u1111a.html>

<http://www.physicsclassroom.com/Class/sound/u1111b.html>

<http://www.physicsclassroom.com/Class/sound/u1111c.html>

MOP Connection: Sound and Music: sublevel 1

TRUE or FALSE: Identify the following statements as being either true (T) or false (F).

T or F?

- _____ 1. Sound waves are longitudinal waves.
- _____ 2. As the teacher talks, students hear the voice because particles of air move from the mouth of the teacher to the ear of the student.
- _____ 3. Sound waves are mechanical waves.
- _____ 4. All sound waves are produced by a vibrating object.
- _____ 5. A sound wave does not consist of crests and troughs.

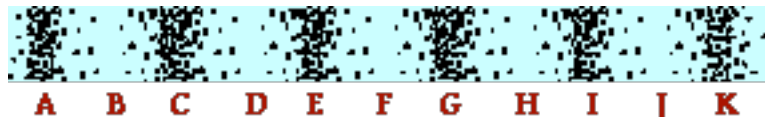
6. Mac is talking to Kate. The dot at A represents a particle of air. Describe the motion that this particle must undergo in order for Kate to hear Mac. Then show the motion by placing arrows on the diagram.



7. Tosh is holding one end of a slinky; the opposite end is attached to a wall. Tosh wishes to produce a longitudinal wave in the slinky. Describe how Tosh must move his hand in order to produce a longitudinal wave. Then place arrows on the diagram to show the way in which Tosh must move his hand.



8. A sound wave is moving through air. The diagram below represents a snapshot of the air particles at a given instant in time. Several regions are labeled with a letter. Use the letters to identify the compressions and rarefactions.



Compressions: _____ Rarefactions: _____

9. A science fiction film depicts inhabitants of one spaceship (in outer space) hear the sound of a nearby spaceship as it zooms past at high speeds. Critique the physics of this film.