The Doppler Effect

Read from **Lesson 3** of the **Sound and Music** chapter at **The Physics Classroom:**

http://www.physicsclassroom.com/Class/sound/u11l3b.html

MOP Connection: Sound and Music: sublevel 4

1. **TRUE** or **FALSE**:

   Ken Fused is standing on a corner when a police car passes by with its siren on. Ken hears a different pitch when the police car is approaching him than when it is past him. This is because the siren on the front of the car is set to a higher pitch than the siren on the back of the car.

2. Describe the real reason Ken Fused observes what he does.

3. **TRUE** or **FALSE**:

   The Doppler shift is a phenomenon that is observed only of sound waves.

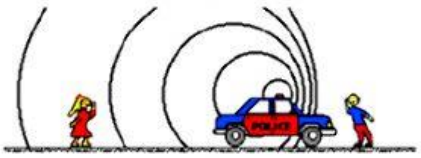
   Explain your answer:

4. **TRUE** or **FALSE**:

   As the source of a sound approaches an observer, the loudness of the sound increases. This is an example of the Doppler Shift.

   Explain your answer:

An automobile is traveling away from Jill and towards Jack. The horn is *honking*, producing a sound wave consisting of the familiar pattern of alternating compressions and rarefactions which travel from their origin through the surrounding medium. The circles on the diagram at the right represent wave fronts; you can think of the wave fronts as the compressions. Observe that the compressions are closer together in front of the car compared to behind the car.



5. Towards which person do the sound waves travel the fastest?
   a. Jack b. Jill c. Both the same.

6. Who will hear the highest frequency?
   a. Jack b. Jill c. Both the same.

7. The Doppler effect can be described as the difference between the frequency at which sound waves are produced and the frequency at which they are observed by the hearer. It occurs when the distance between the source of a sound and the observer is changing. As the source approaches an observer, the observer hears the pitch (or frequency) to be _____ (higher, lower). As the source moves away from an observer, the observer hears the pitch (or frequency) to be _____ (higher, lower).



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