***Doppler Effect Worksheet*** Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. When an automobile moves towards a listener, the sound of its horn seems relatively

a. Low pitched   
b. High Pitched   
c. Normal

1. When the automobile moves away from the listener, its horn seems

a. Low pitched   
b. High Pitched   
c. Normal

1. The changed pitch of the Doppler effect is due to changes in

a. Wave speed b. wave frequency

1. Circle the letter of each statement about the Doppler Effect that is true.
   1. It occurs when a wave source moves towards an observer
   2. It occurs when an observer moves towards a wave source
   3. It occurs when a wave source moves away an observer
   4. It occurs when an observer moves away a wave source
2. True / False: A moving wave source does not affect the frequency of the wave encountered by the observer.
3. True / False: A higher frequency results when a wave source moves towards an observer.
4. Two fire trucks with sirens on speed towards and away from an observer as shown below.



1. Which truck produces a higher than normal siren frequency? How do you know?

B) Which truck produces a lower than normal siren frequency? How do you know?

8. **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.

Justify your answer to question 8.

10. **TRUE** or **FALSE**:

As the source of a sound approaches an observer the pitch 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.

11. Towards which person do the sound waves travel the fastest?

a. Jack b. Jill c. Both the same.

12. Who will hear the highest frequency?

a. Jack b. Jill c. Both the same.



13. 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).