

In today's activity, you will be experiencing the Doppler Effect through the use of a car horn.

**Materials:**

- car with horn
- digital frequency detector

**Part 1: Stationary Source and Observer**

1. Draw a diagram of the sound waves being observed when the horn is creating when the car is at rest:

2. Using the digital frequency detector, make note of the frequency of the car horn.

Car horn at rest = \_\_\_\_\_ Hz

**Part 2: Source Moving Toward Observer**

1. Draw a diagram of the sound waves that are observed when the car is in motion toward the observer:

2. Using the digital frequency detector, make note of the frequency of the car horn when it is approaching the observer.

Car horn moving toward observer = \_\_\_\_\_ Hz

3. How does the frequency that is observed when the car horn is at rest compare to the frequency of the car horn that is observed when it is moving toward the observer? Does this finding support your diagrams above? Explain.

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**Part 3: Source Moving Away from Observer**

1. Draw a diagram of the sound waves that are observed when the car is in motion away from the observer:

2. Using the digital frequency detector, make note of the frequency of the car horn when it is moving away from the observer.

Car horn moving away from observer = \_\_\_\_\_ Hz

3. How does the frequency that is observed when the car horn is at rest compare to the frequency of the car horn that is observed when it is moving away from the observer? Does this finding support your diagrams above? Explain.

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**Questions to consider:**

1. How would the observed frequency compare to the emitted frequency if the observer was moving in the same direction at the same velocity as the car? Draw a diagram to support your answer.

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2. Based on your findings, how would the observed frequency compare to the emitted frequency if the observer was moving toward a stationary car? Draw a diagram to support your answer.

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3. How would the observed frequency compare to the emitted frequency if the observer was moving away from a stationary car? Draw a diagram to support your answer.

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