

In this activity, you will experience the Doppler effect through the use of a car horn.

**Materials:**

- car with horn
- digital frequency detector

**Part One: Stationary Source and Observer**

1. Draw a diagram of the observed sound waves created by the horn when the car is at rest.

2. Record the frequency of the car horn according to the digital frequency detector.

car horn at rest = \_\_\_\_\_ Hz

**Part Two: Source Moving Toward Observer**

3. Draw a diagram of the observed sound waves created by the horn when the car is moving toward the observer:

4. Record the frequency of the car horn according to the digital frequency detector.

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

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

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**Part Three: Source Moving Away From Observer**

6. Draw a diagram of the observed sound waves created by the horn when the car is moving away from the observer:

7. Record the frequency of the car horn according to the digital frequency detector.

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

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

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**Questions to consider:**

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

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

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

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