**Doppler Effect**

1. Look at the “Sound” simulation on the PhET.colorado.edu site. Investigate how the wave changes as you adjust the various parameters. Draw a picture of a sound wave below. Draw a wave that is a low sound and one that is a high sound. What is different between the two?
2. If a tuning fork is sounding and then swung over a person’s head, how do you think it will sound?

**Demonstration**

1. After listening to the demonstrations, describe what you heard.
2. *Prediction:* Draw a picture or pictures that show how wave fronts (like shown in the Sound sim) might look while a speaker is moving towards you. Draw how it would look if the speaker were moving away from you.

**Class Discussion and Explanation**

1. Describe in your own words as you might to your students, how the Doppler effect works.

The demonstration is to show the first 10 seconds of the “The Sound of Audi” video. This video will eventually be posted on explore sound but right now can be found at <http://www.youtube.com/watch?v=sY7KhvdtB9I>

This 10 seconds of video is shown and astudents are asked what they observe about the sounds. This takes several showings before the class comes to the idea that the pitch is higher as it heads towards you and lower as it drives away. Students may also talk about the car is loudest when it’s right in front of the man with the microphone. T his is true but the Doppler effect deals with the pitch change.

Now show <http://www.youtube.com/watch?v=a3RfULw7aAY> and discsus what is heard. It takes fewer showings since most of the observing was done with the Audi video.

Now demonstrate the tuning fork spinning it around your head while it vibrates loud enough for the class to hear it.

Now draw on the board wave fronts for a high frequency and wave fronts for a low frequency and ask students to think about the car moving and try to come up with a theory as to why the pitch sounds higher as the car approaches and lower as it drives away.

Have every group report out on their theories and then show the answer.

Discuss how hard it’d be to understand and describe to someone why you hear a difference if you didn’t have the model of sound waves that we got from the Sound Sim.