

Caynen Hansen  
*Freaky Flames*

Last year, after seeing a video on the internet, I conducted my science fair experiment on the Ruben's Tube. All of the right elements were there but I was focused on the "awe factor" of having fire obey my will. In the end I didn't really have an experiment and my science fair wasn't that good. This year before science fair I was trying to figure out what I should do my experiment on. Then I realized I have a perfectly fine piece of pipe that is a classic physics demonstration of sound representation. All I had to do was find an application for my Ruben's tube and I would have a project. I set to work perfecting the tube. I made some minor repairs like adding more caulking but then I also figured out the exact amount of gas needed to have a good standing flame and what density rubber to use as my membrane. My tube was ready for action. I knew that the point of the Ruben's Tube was to create sound visualization but I was intrigued to see if the Ruben's Tube could create sine wave patterns (the waves shown in my book) of frequencies that the human ear could not comprehend. I soon found a tone generator online that I quickly downloaded to my laptop. I rigged up a way to connect my laptop to my stereo by way of auxiliary wire. Now I could choose exactly what hertz was going to be played into my tube. I conducted my experiment and recorded my data. I found out that the Ruben's Tube could not create sound visualization of tones out of the range of human hearing. My hypothesis had been proven correct. It was my understanding, after researching sound, that the higher the frequency the more compressed a sound wave is. The Ruben's tube was too short to interpret these compressed waves. The same thing applies for the low tones, they had waves that were spread out which is called rarefaction. Again, the Ruben's tube failed to show the waves. I disassembled the tube and finished science fair.