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| [Homepage](http://docs.google.com/homepage.htm)  [Abstract](http://docs.google.com/abstract.htm)  [Introduction](http://docs.google.com/introduction.htm)  [Review of the Literature](http://docs.google.com/research.htm)  [Statement of the Problem](http://docs.google.com/problem.htm)  [Hypothesis](http://docs.google.com/hypothesis.htm)  [Materials](http://docs.google.com/materials.htm)  [Procedure](http://docs.google.com/procedure.htm)  [Results](http://docs.google.com/results.htm)  [Recommendations](http://docs.google.com/recommendations.htm)  [Acknowledgments](http://docs.google.com/acknowledgements.htm)  [Images](http://docs.google.com/images.htm)  [Works Cited](http://docs.google.com/workscited.htm) | The basic energy that runs the life on this planet is light. The light from the sun gives food and warmth to provide for life. There is, however, another source of energy on earth: sound. Just like light, sound is transmitted in waves,   |  | | --- | |  | | Diagram 1 |   being shaped by frequency, the rate of oscillation, amplitude, the height of the wave, and the wavelength, or the distance between two waves. (1) (See [diagram 1](#gjdgxs), [2](#30j0zll) and [3](#1fob9te)) Sound also, like light, comes in a variety of spectrums that humans can or can not perceive. The light spectrum ranges from low frequencies like radio waves to high frequencies like gamma or cosmic rays. (6) (See [diagram 4](#3znysh7)) Humans are also limited to the range of sound they can hear or emit. (1) Humans can normally hear sounds that range between 20Hz and 20,000Hz. (1) Different animals can hear and/or emit different frequencies of sound than humans can. (1) For example, dogs can hear high pitch frequencie s that humans can't hear and elephants can hear low frequencies that humans can't detect either. (4) (See [diagram 5](#2et92p0)) The waves created by a noise travel through the air by setting other   |  | | --- | |  | | Diagram 2 |   molecules in motion. The wave moves by first having a source that sets the molecules in motion. These molecules hit other molecules, allowing the sound wave to travel outward. (2) The trough of the wave is created as the molecules snap back into place. (2) When there isn't enough energy left to displace the molecules, the sound is said to have died out. (2) Sound, therefore, is a vibration that moves in waves and can move through anything that can vibrate. (4) The phenomenon of matter vibrating in symphony with the original source of the sound from the sound waves emitted is called vibrational sympathy. (5) The moving molecules can even make objects vibrate, lending credibility to the myth of high singing shattering glass. The high pitch emitted from the singer travels at a fast frequency, bombarding the glass with waves of vibrations until it shatters. (5)   |  | | --- | |  | | Diagram 3 |   Sound is produced every second of everyday. Sound that is called "noise" has little or no organization or pattern in its wave. (8) Static, wind, thunder and jet engines are sounds that fall into this category since they don't have any pattern in their sound waves. (8) When silence is perceived by the human brain, it is not that there isn't sound in the air at the present time. The sound waves are actually disturbing the air faster than 20,000 times per second, which is so fast human's hearing mechanisms can't handle it and perceive silence. (8) The sound that is commonly called music was defined by composer Edgar Varese as "ordered sound," since the sound waves produced are carefully controlled. (8) How   |  | | --- | |  | | Diagram 4 |   the human brain hears the sound relies heavily on how quickly the sound waves are hitting the receptor. When air disturbances come at less than 16 times per second, individual noises are heard, such as clicks, pops, or a drip of water. When the wave comes faster than 16 times per second, though, the nervous system can't deal with hearing that many individual noises in a second. The disturbances are combined into a single event-commonly called a musical note. (8) When a device is created that can control the rates of the sound waves, it is called a musical instrument. (8) A musical instrument that can disturb the air at a rate of 440 times per second can produce the note A above middle C.   |  | | --- | |  | | Diagram 5 |   [Next Page](http://docs.google.com/research2.htm) |