

Science Learning Activity 1

D. French

The Decibel Scale

Students will practice calculating decibels based on the intensity of sounds.

Learning Objectives:

- 1. Students will calculate the sound level in decibels using logarithms.
- 2. Students will calculate the pressure of sound waves based on their intensity with respect to the threshold of hearing.
- 3. Students will extrapolate data from a chart to use in a mathematical analysis.

Materials Required:

• Calculator that can do logarithms and exponents.

References:

- http://www.coolmath.com/decibels1.htm. Accessed April 2010.
- http://physics.info/intensity/. Accessed April 2010.
- http://web.cvcaroyals.org/~rheckathorn/ (PPT on the Decibel Scale). Accessed April 2010.
- Serway, R. and Beichner, R. Physics for Scientists and Engineers. 5th Edition. pg. 526

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The Common Core Math or Next Generation Science Standard mapping:

Middle school MS-PS4-2.	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
High School	
HS-PS4-1.	Use mathematical representations to support a claim
	regarding relationships among the frequency, wavelength, and speed of waves traveling in various media

- <u>CCSS.Math.Content.HSF-IF.C.7e</u> Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
- CCSS.Math.Content.HSF-LE.A.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
- <u>CCSS.Math.Content.HSF-IF.C.8b</u> Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02)t, y = (0.97)t, y = (1.01)12t, y = (1.2)t/10, and classify them as representing exponential growth or decay.

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