

## Worksheet - Sound Intensity

1. \_\_\_\_\_ is a measure of the "loudness" of a sound.  
Why can't loudness be measured?

2. The equation for calculating sound intensity is  $I = \text{---}$   
The MKS unit is the \_\_\_\_\_ per \_\_\_\_\_.

3. Sound waves travel from the source in the shape of a \_\_\_\_\_. The formula for the area of a sphere is  $A = \text{_____}$ . Insert this into the intensity equation:

$I = \text{_____}$
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4. What is the intensity of a 1.5 w sound at a distance of 5.2m?

5. How much power does a sound source generate if the intensity is  $2.4 \times 10^{-6} \text{ w/m}^2$  at a distance of 2.3m?

6. An intensity of  $1.0 \times 10^{-1} \text{ w/m}^2$  can cause damage to the ears. If the power of sound from a rock band's amplifier is 85 w, how far are you standing from the speaker if you are damaging your ears?

7. Relative intensity,  $\beta$ , is a way of expressing the ratio of the intensity of a sound to the \_\_\_\_\_ of hearing at that frequency. The \_\_\_\_\_ is the unit for expressing relative intensity. Why is this called a dimensionless unit?