

## **Decibel Scale Worksheet**



## Name:

The loudness of sound is measured in decibels (dB). Most sounds fall between zero and 100 on the decibel scale making it a very convenient scale to understand and use. Each increase of 20 decibels (dB) for a sound will be about twice as loud to your ears. Use the following table to help you answer the questions.

| Level  | Source  |
|--------|---|
| 10 dB  | A quiet whisper 3 feet away                     |
| 40 dB  | Background noise in a house                     |
| 60 dB  | Ordinary conversation 3 feet away               |
| 70 dB  | City traffic                                    |
| 90 dB  | A jackhammer cutting up the street 10 feet away |
| 100 dB | Listening to headphones at maximum volume       |
| 110 dB | Front row of a rock concert                     |
| 120 dB | The threshold of physical pain from loudness    |

## **Example for Intensity Problems:**

How many times more intense is city traffic than a quiet whisper?

 $\begin{aligned} Traffic &= 70 \ dB \to 7 \\ Whisper &= 10 \ dB \to 1 \\ 7-1 &= 6. \quad That's \ 6 \ multiples \ of \ ten \ . \\ 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 1,000,000 \ times \ louder \end{aligned}$ 

- 1. How many times more intense than a jackhammer does the front row at a rock concert sound?
- 2. How many times less intense is the whisper than an average house?
- 3. How many decibels would you hear in a room that is 100 as intense as an average house?
- 4. How many times less intense is the 30 dB than headphones at maximum volume?
- 5. How many times more intense than city traffic does the front row at a rock concert sound?
- 6. What sound source is 10 times less intense than the threshold of pain?
- 7. What sound source is 100 times more intense than city traffic?
- 8. What sound source is 1,000,000 times less intense than city traffic?

- 9. When you whisper, you produce a 10-dB sound.
  - a. When you speak quietly, your voice sounds 100 as intense as a whisper. How many decibels is this?
  - b. When you speak normally, your voice sounds 10,000 times as loud as a whisper. How many decibels is this?
  - c. When you yell, your voice sounds 100,000,000 times as loud as a whisper. How many decibels is this?
- 10. How much more intense is a jackhammer 10 feet away than city traffic?
- 11. How many times less intense is the rock concert than the threshold of pain?