Sound Intentsity

Sound intensity is another thing we're going to talk about here, and this is the rate at which energy is transferred through an area. The formula is intensity equals power divided by 4 pi r squared. And r is the distance from the point source. So you're looking at a distance there.

And the units are watts, which are the units of power, over meters squared. And then oftentimes you'll hear people refer to sound intensity in decibels. And that's just a relative intensity that really puts the scale a little bit easier for us to recognize. And you'll notice that in some of your readings.

So let's do an example problem of intensity. If a saxophone is 4.3 meters away, what is the intensity of the sound wave produced by a saxophone that has a power output of 0.17 watts? Assume the sound waves are spherical.

So we identify our givens. And of course, we're looking for intensity. Intensity equation is power divided by 4 pi r squared. Plugging in our numbers, be careful to only square the r. This is the only thing squared in this algebraic equation. And then we get our intensity to be 7.32 times 10 to the negative 4 watts per meter squared.