**Activity 4.1.4 Other Applications of an Inverse Square Law**

1. Radiation spreads out as it travels away from the gamma or X-ray source.  Like light therefore, the intensity of the radiation depends on how far you are from the source.  Suppose that for a particular source, the intensity is 90 milliroentgen/hour at 2 meters and 10 milliroentgen/hour at 6 meters.
2. How does the intensity vary with distance?
3. Write the equation for this situation.
4. What would be the intensity if your distance from the source were:

15 meters? 10 meters? 3 meters? 10 centimeters?

1. Radiation machines produce an intensity of radiation that varies inversely as the square of the distance from the machine. Suppose that for a particular source, the radiation intensity is 80 milliroentgens per hour at 3 meters.
2. Write the general equation that represents this situation.
3. What is the intensity at a distance of 2 meters?
4. Sound Intensity I is inversely proportional to the square of the distance d from the sound source.
5. Write an equation that represents this situation.
6. If a person moves 6 times as far from the source, how will the intensity of sound be affected?
7. The Inverse square law applies to many situations such as [Newton's Law of Universal Gravitation](http://en.wikipedia.org/wiki/Newton%27s_law_of_universal_gravitation) as do the effects of [electric](http://en.wikipedia.org/wiki/Electricity), [magnetic](http://en.wikipedia.org/wiki/Magnetism), [light](http://en.wikipedia.org/wiki/Light), [sound](http://en.wikipedia.org/wiki/Sound), [radiation](http://en.wikipedia.org/wiki/Radiation) phenomena and photography. Below are suggested websites to research how the inverse square law works in these fields. You are not limited to our suggestions. You can choose a different website but you must bring in the addresses to class. Be prepared to give a brief talk in class on what you have learned.

The Inverse Square Law– as it applies to photography

<http://digital-photography-school.com/an-introduction-to-the-inverse-square-law/>

<http://photography.tutsplus.com/articles/rules-for-perfect-lighting-understanding-the-inverse-square-law--photo-3483>

The Inverse Square Law – as it applies to gravity

<http://www.tutorvista.com/physics/inverse-square-law-gravitation>

<http://www.astronomynotes.com/gravappl/s5.htm>

The Inverse Square Law – as it applies to sound

<http://www.sengpielaudio.com/calculator-squarelaw.htm>

<http://www.acousticalsurfaces.com/acoustic_IOI/101_5.htm>