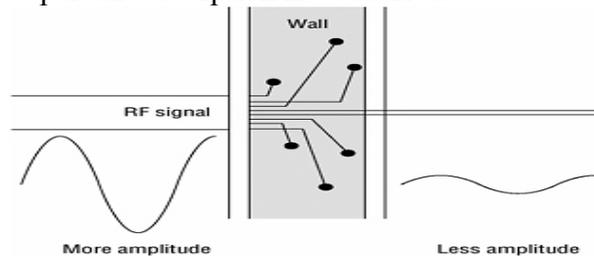


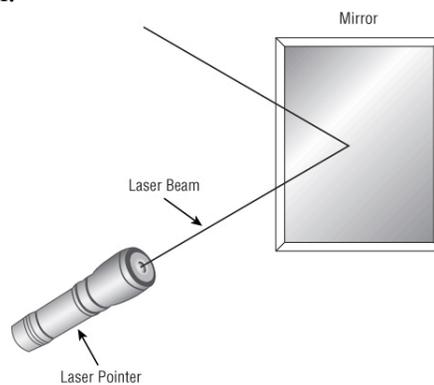
CWNA- Certified Wireless Network Administrator Official Study Guide

In chapter 2 Radio Frequency Fundamentals, I would like to talk about RF propagation behaviors, which includes absorption, reflection, scattering, refraction, diffraction, free space path loss, multipath, attenuation, and gain. Before we discuss about RF propagation behaviors, it is important to know how RF wave moves, because propagation; can vary drastically depending on the materials in the signal's path. For example, drywall will have a much different effect on an RF signal than metal or concrete.

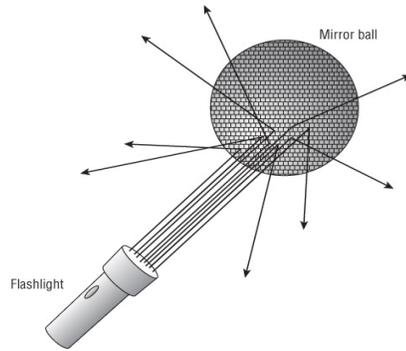
Absorption; if the signal does not bounce off an object, move around an object, or pass through an object, then 100 percent absorption has occurred.



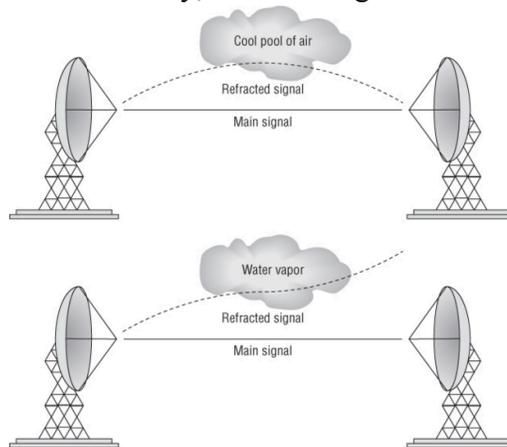
Reflection; this is one of the most important RF propagation behaviors. When a wave hits a smooth object that is larger than the wave itself, depending upon the media, the wave may bounce in another direction.



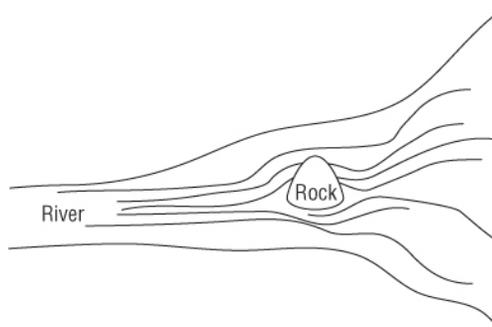
Scattering; this means, in this situation the shorter blue wavelength light is absorbed by the gases in the atmosphere and radiated in all directions. This is another example of an RF propagation behavior and sometime called scatter, which can also be described as multiple reflections.



Refraction; this means if certain conditions exist; an RF signal can be bent in a behavior. A straightforward definition of refraction is the bending of an RF signal as it passes through a medium with a different density, thus causing the direction of the wave to change.



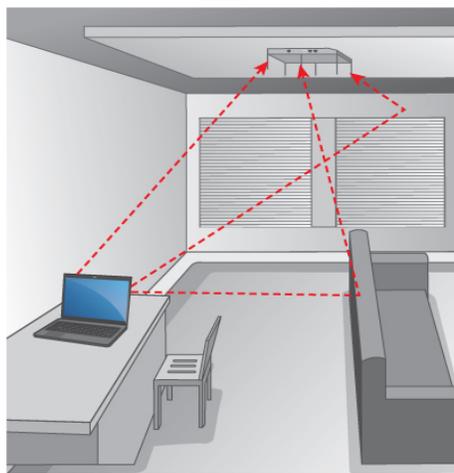
Diffraction; similar as refraction but another RF propagation behavior exists that also bends the signal. Diffraction is the bending of an RF signal around an object and the bending and the spreading of an RF signal when it encounters an obstruction.



Free Space Path Loss; is the loss of signal strength caused by the natural broadening of the waves often referred to beam divergence.

Distance (km)	Attenuation (dB)	
	2.4 GHz	5 GHz
1	100.0	106.4
2	106.1	112.4
4	112.1	118.5
8	118.1	124.5

Multipath; is a propagation phenomenon that results in two or more paths of a signal arriving at a receiving antenna at the same time or within nanoseconds of each other. The Four lists of multipath are downfade, upfade, nulling, and data corruption.



Loss (Attenuation); is best described as the decrease of amplitude or signal strength. A signal may lose strength while on a wire or in the air.

Gain (Amplification); can best be described as the increase of amplitude or signal strength. The two types of gain are known as active gain and passive gain. Active gain is usually caused by the use of an amplifier on the wire that connects the transceiver to the antenna. Passive gain is accomplished by focusing the RF signal with the use of an antenna.

