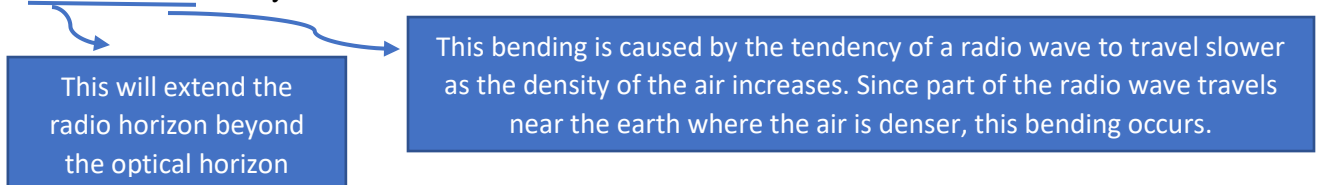


TX #3: Antenna System Design

- The **design of the transmit & receive antenna system** is important because it determines how well energy transferred from one antenna to another.
- What are the factors? Some of it are gain, directivity, polarization and height above the ground.
- Radio waves are like light waves because they tend to travel in straight line. But they tend to **refract or bend** as they follow the curvature of the earth.



- In studying the behavior of radio waves in space, it is more convenient to use a path that is straight line instead of a curve.
- As the **distance** between the transmitting and the receiving antennas **increases**, the **energy concentration** for a given area **decreases**. This type of signal loss is known as path attenuation, expressed in decibels (dB).
- The **amount of power available at the receiving antenna is dependent on the amount of energy** the antenna intercepts. An electrically large antenna will intercept more energy than an electrically small antenna.
- The dimensions of an antenna are related to the wavelength. The higher the frequency, the smaller the antenna for a given wavelength

Smaller antenna intercepts less energy, hence there is a **decrease in usable ranges** as **frequency increases**

We can increase the size (in terms of wavelength) of higher frequency antennas – so that they can intercept more power. These are what called as 'gain' antennas