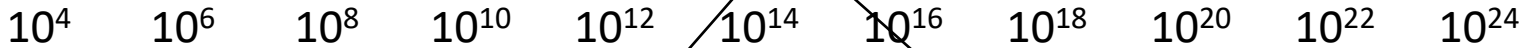
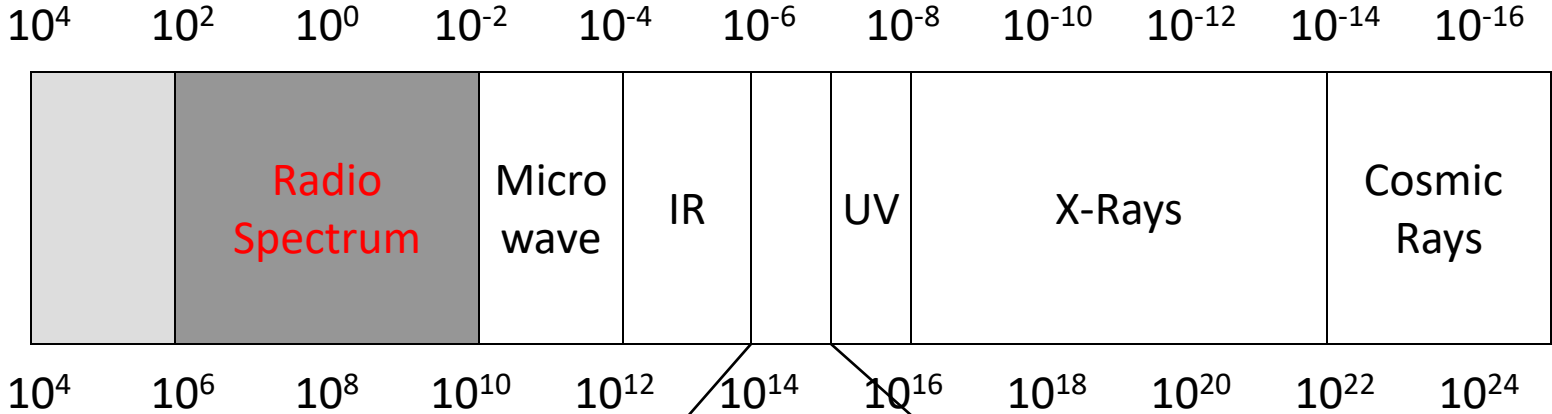


What is Wireless and Mobile
Communication?

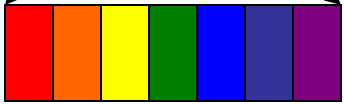
Wireless Communication

- Transmitting voice and data using electromagnetic waves in open space
- Electromagnetic waves
 - Travel at speed of light ($c = 3 \times 10^8$ m/s)
 - Has a frequency (f) and wavelength (λ)
 - $c = f \times \lambda$
 - Higher frequency means higher energy photons
 - The higher the energy photon the more penetrating is the radiation

Electromagnetic Spectrum



1MHz ==100m
 100MHz ==1m
 10GHz ==1cm



Visible light

< 30 KHz	VLF
30-300KHz	LF
300KHz – 3MHz	MF
3 MHz – 30MHz	HF
30MHz – 300MHz	VHF
300 MHz – 3GHz	UHF
3-30GHz	SHF
> 30 GHz	EHF

Wavelength of Some Technologies

- **GSM Phones:**
 - frequency \approx 900 Mhz
 - wavelength \approx 33cm
- **PCS Phones**
 - frequency \approx 1.8 Ghz
 - wavelength \approx 17.5 cm
- **Bluetooth:**
 - frequency \approx 2.4Gz
 - wavelength \approx 12.5cm

Frequency Carriers/Channels

- The information from sender to receiver is carrier over a well defined frequency band.
 - This is called a channel
- Each channel has a fixed frequency bandwidth (in KHz) and Capacity (bit-rate)
- Different frequency bands (channels) can be used to transmit information in parallel and independently.