**Communications**

* Human Communication was revolutionized with
  + Speech ~ 100,000 years ago
  + Symbols ~ 30,000 years ago
  + Writing ~ 5,000 years ago
* Cave Paintings
* Writing
  + Originally based on pictographic elements
  + First Writing systems is contemporary with the beginning of the bronze age in the late 4000 BC
* 2600 BC writing with a wedge shaped stylus began to represent syllables of a spoken Sumerian language.
* Paper was Invented in ancient China during the Han Dynasty (206 BC – 220 AD)
* Moveable type printing
  + Started the printing revolution
  + Johannes Gutenberg was the First European to invent and use moveable type printing
* Electric Communications
  + Joseph Henry ~ American Scientist
    - Invented a precursor to the modern day doorbell.
  + Samuel Morse
    - Invented a single wire telegraph system
      * Co-developer of the Morse code and help to develop the commercial use of telegraphing
    - Built a telegraph system from Washington DC to Baltimore.
  + Bell and Watson
    - Inventor of the bi directional phone.
  + Teleprinter exchange
    - German invention for text transmission
    - 1958 US built a teleprinter exchange
    - by the late 1970s, many countries around the world adopted fax.
  + 1969 Advanced Research Project Agency created the first computer network (ARPANET)
  + 1971 Ray Tomlinson creates the username@hostname email standard
  + 1974 Vinton Cerf and Robert Kahn present the TCP/IP (Transmission Control Protocol/ IP Wide Area Network)
  + Connection of the ARPANET to the NSFNET leads to the use of the term internet.
    - Internet was the connection of computers together
  + Tim Berners Lee presents the World wide web Standard.
  + 1993 Marc Anderson develops Mosaic, the first graphical browser.