1. An acronym for ElectroMotive Force, the term we use to describe anything which behaves like an electrical pump. Batteries, generators, thermoelectric devices, solar cells, and piezoelectric crystals all do the same job in an electrical circuit. They pick conduction charges up at points of low potential energy and lift them up to high potential energy. If we imagine that current is positive charge in motion, then an EMF pumps the current from low voltage up to high voltage. EMF is measured in volts.

2. An acronym for ElectroMagnetic Field. These fields are produced by power lines, transformers, appliances and radio frequency-RF sources such as microwave ovens, cellular phones, AM/FM/TV transmitters, radars,etc. During the last 15 years various scientific studies in the United States and in Sweden have demonstrated a statistically significant association between electromagnetic fields from power lines and certain types of cancers in both children and adults. An electromagnetic field, sometimes referred to as an EM field, is generated when charged particles, such as electrons, are accelerated. All electrically charged particles are surrounded by electric fields. Charged particles in motion produce magnetic fields. When the velocity of a charged particle changes, an EM field is produced. Electromagnetic fields were first discovered in the 19th century, when physicists noticed that electric arcs (sparks) could be reproduced at a distance, with no connecting wires in between. This led scientists to believe that it was possible to communicate over long distances without wires. The first radio transmitters made use of electric arcs. These spark transmitters and the associated receivers were as exciting to people in the early 20th century as the Internet is today. This was the beginning of what we now call wireless communication. Electromagnetic fields are typically generated by alternating current (AC) in electrical conductors. The frequency of the AC can range from one cycle in thousands of years (at the low extreme) to trillions or quadrillions of cycles (hertz) per second (at the high extreme). The standard unit of EM frequency is the hertz, abbreviated Hz. Larger units are often used. A frequency of 1,000 Hz is one kilohertz (kHz); a frequency of 1,000 kHz is one megahertz (MHz); a frequency of 1,000 MHz is one gigahertz (GHz). The wavelength of an EM field is related to the frequency. If the frequency f of an EM wave is specified in megahertz and the wavelength w is specified in meters (m), then in free space, the two are related according to the formula w = 300/f(mhz). For example, a signal at 100 MHz (in the middle of the American FM broadcast band) has a wavelength of 3 m, or about 10 feet. This same formula applies if the frequency is given in gigahertz and the wavelength is specified in millimeters (mm). Thus, a signal at 30 GHz would have a wavelength of 10 mm, or a little less than half an inch.