Electromotive Force Encyclopedia Article

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Electromotive Force

In an **electric circuit**, electromotive **force** is the **work** done by a source on an electrical charge. Because it is not really a force, the term is actually a misnomer; it is more commonly referred to by the initials EMF. EMF is another term for electrical potential, or the difference in charge across a battery or **voltage** source. For a circuit with no current flowing, the potential difference is called EMF.

Electrical sources that convert **energy** from another form are called seats of EMF. In the case of a complete circuit, such a source performs work on electrical charges, pushing them around the circuit. At the seat of EMF, charges are moved from low electrical potential to higher electrical potential.

Water flowing downhill in a flume is a good analogy for charges in an electric circuit. The water starts at the top of the hill with a certain amount of **potential energy**, just as charges in a circuit start with high electrical potential at the battery. As the water begins to flow downhill, its potential energy drops, just as the electrical potential of charges drops as they travel through the circuit. At the bottom of the hill, the potential energy is minimum, and work must be performed to pump it to the top of the hill to travel through the flume again. Similarly, in an electrical circuit, the seat of EMF performs work on the charges to bring them to a higher potential after their trip through the circuit.