

1820

Physics and Its World *Timeline 1830–1890*



1831

$$\text{emf} = -N\Delta \frac{[AB(\cos\theta)]}{\Delta t}$$

Michael Faraday begins experiments demonstrating electromagnetic induction. Similar experiments are conducted around the same time by **Joseph Henry** in the United States, but he doesn't publish the results of his work at this time.

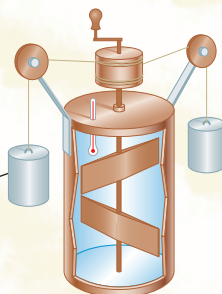


1831 – **Charles Darwin** sets sail on the H.M.S. *Beagle* to begin studies of life-forms in South America, New Zealand, and Australia. His discoveries form the foundation for the theory of evolution by natural selection.

1830



1837 – **Queen Victoria** ascends the British throne at the age of 18. Her reign continues for 64 years, setting the tone for the Victorian era.

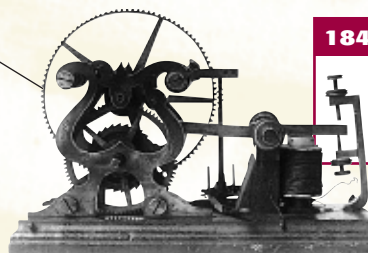


1843

$$\Delta U = Q - W$$

James Prescott Joule determines that mechanical energy is equivalent to energy transferred as heat, laying the foundation for the principle of energy conservation.

1840



1844

Samuel Morse sends the first telegraph message from Washington, D. C. to Baltimore.



1843 – **Richard Wagner's** first major operatic success, *The Flying Dutchman*, premieres in Dresden, Germany.

1850



1850 – **Harriet Tubman**, an ex-slave from Maryland, becomes a “conductor” on the Underground Railroad. Over the next decade, she helps more than 300 slaves escape to northern “free” states.



1850

$$W = Q_h - Q_c$$

Rudolph Clausius formulates the second law of thermodynamics, the first step in the transformation of thermodynamics into an exact science.

1860