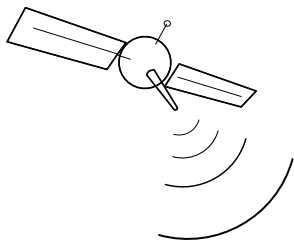


# The Earth's Energy *Budget*



The energy budget diagram on the front shows our best understanding of energy flows into and away from the Earth. It is based on the work of many scientists over more than 100 years, with the most recent measurements from the Clouds and the Earth's Radiant Energy System (CERES; <http://science.larc.nasa.gov/ceres/>) satellite instrument providing high accuracy data of the radiation components (reflected solar and emitted infrared radiation fluxes).

This energy balance determines the climate of the Earth. Our understanding of these energy flows will continue to evolve as scientists obtain a longer and longer record using new and better instruments (<http://clarreo.larc.nasa.gov/>).

*Did you know?*

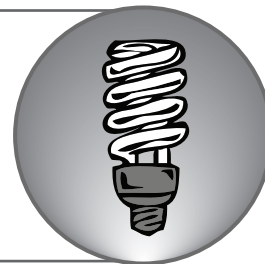
## *Units:*

*Energy fluxes are measured as Watts per square meter.*

*Watt: a standard unit of power.*

*Joule: a standard unit of energy*

*1 Watt = 1 Joule / sec*



Next Generation Science Standards (NGSS): <http://www.nextgenscience.org/>

- 4-PS3-2      **Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat and electric currents.**
- 5-ESS2-1      **Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.**
- MS-PS3-5      **Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.**
- HS-ESS2-4      **Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.**
- HS-PS3-1      **Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.**
- HS-ESS3-5      **Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.**
- HS-ESS3-6      **Use a computational representation to illustrate the relationship among Earth systems and how those relationships are being modified due to human activity.**

You can find more information, resources, and activities on this concept at:

**[http://science-edu.larc.nasa.gov/energy\\_budget](http://science-edu.larc.nasa.gov/energy_budget)**

*Additional information sections available on the reverse side of the large poster*

*Standards*