

WEATHER

Weather dynamics is the study of how the motion of water and air causes weather patterns.

Earth's Energy Balance

Almost all of the energy on Earth comes from the Sun in the form of radiation. Radiation is the transfer of energy by waves.

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**Conduction** is the transfer of energy in solids.

**Convection and advection** are the transfer of energy by the movement of liquids (water) and gases (atmosphere). Convection transfers energy vertically (↑↓) and advection horizontally (↔).

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Reflection and Absorption of Energy  
Of all the Sun's energy that hits the Earth:

50% is absorbed by land/oceans  
20% is absorbed by clouds  
27% is reflected by clouds  
3% is reflected by surface  
100%

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The amount of reflection depends on the **albedo** of the material.

Snow - high albedo - mostly reflected

black soil - low albedo - mostly absorbed

**Heat sinks** are objects that warm up (absorb energy) like the oceans (water). The heat taken in by water causes it to move by convection.

Soil and rock are poor heat sinks

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