

Amazing Weather!

Hurricane Igor, St. John's, 2010
Tsunami, Japan, 2011

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Weather Dynamics

Weather Dynamics is the study of how the movement of water and air causes weather patterns. The main components of Earth that affects weather are:

- 1) the atmosphere
- 2) the land forms, and
- 3) water in any form (solid, liquid and vapor).

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What's the difference between weather and climate ?

But seriously...

Weather - is the set of environmental conditions encountered from one day to the next.
ex.

Climate - is the set of environmental conditions averaged over many years.
ex.

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Areas of the Earth...

Tropical Region (Tropics) - region located between the Tropic of Cancer and the Tropic of Capricorn.

Polar Regions - Region north of the Arctic Circle and the region south of the Antarctic Circle.

Mid-latitude Regions - Regions between the tropics and the polar regions.

Special Lines of Latitude

Tropic of Cancer 23.5° North latitude
Tropic of Capricorn 23.5° South latitude
Arctic circle 66.5° North latitude
Antarctic circle 66.5° South latitude

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Longitude - the angle measured east or west from the 0 line, which passes through Greenwich, England.

Latitude - the angle measured south or north of the equator:

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How does heat energy get moved around to these different areas of the earth?

1. Radiation is the transfer of energy by waves travelling at 300 000 000 m/s.

Radiation does not require a medium. This means it can travel through empty space.

Visible light is one form of radiation that reaches us from the sun via empty space.

Visible light is only one part of **the electromagnetic spectrum**

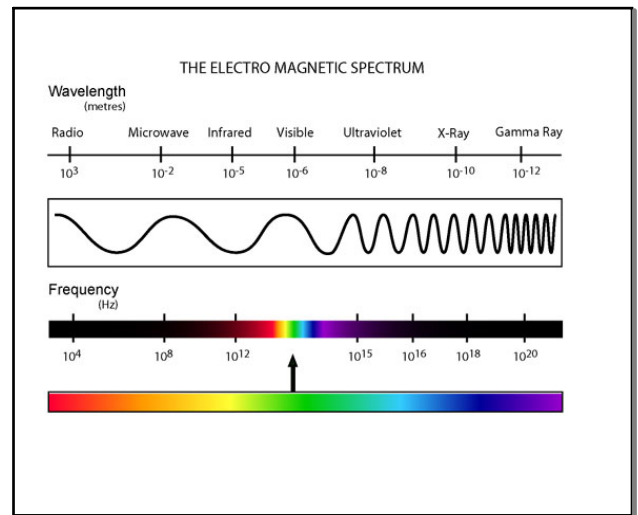
What are some other kinds of light waves?

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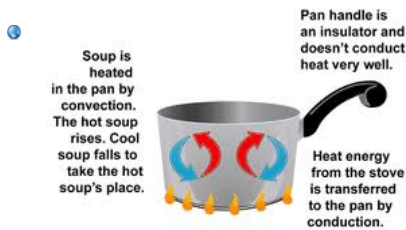
2. Conduction

...is the transfer of energy through the collision of particles in a **solid**.

A pan on a stove element heats up by conduction.

Some materials are better conductors of heat than others.

Metals are generally better conductors than materials like rock, sand, wood.



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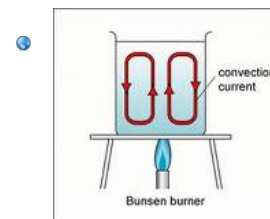
3. Convection

...is the transfer of energy **vertically** by movement of particles in a **fluid** (water or atmosphere).



4. Advection

...is the transfer of energy **horizontally** by movement of particles in a **fluid** (water or atmosphere).



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