Earth’s Atmosphere

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What Comprises Earth's Atmosphere?

A combination of gases (nitrogen & oxygen)
& particles (dust, water droplets & ice crystals)

Earth’s Atmosphere is composed of 78% nitrogen (N_2) & 21% oxygen (O_2)

The other 1% consists of argon (Ar), carbon dioxide (CO_2), water vapor (H_2O), & other trace gases

How Many Layers Comprise Earth's Atmosphere?

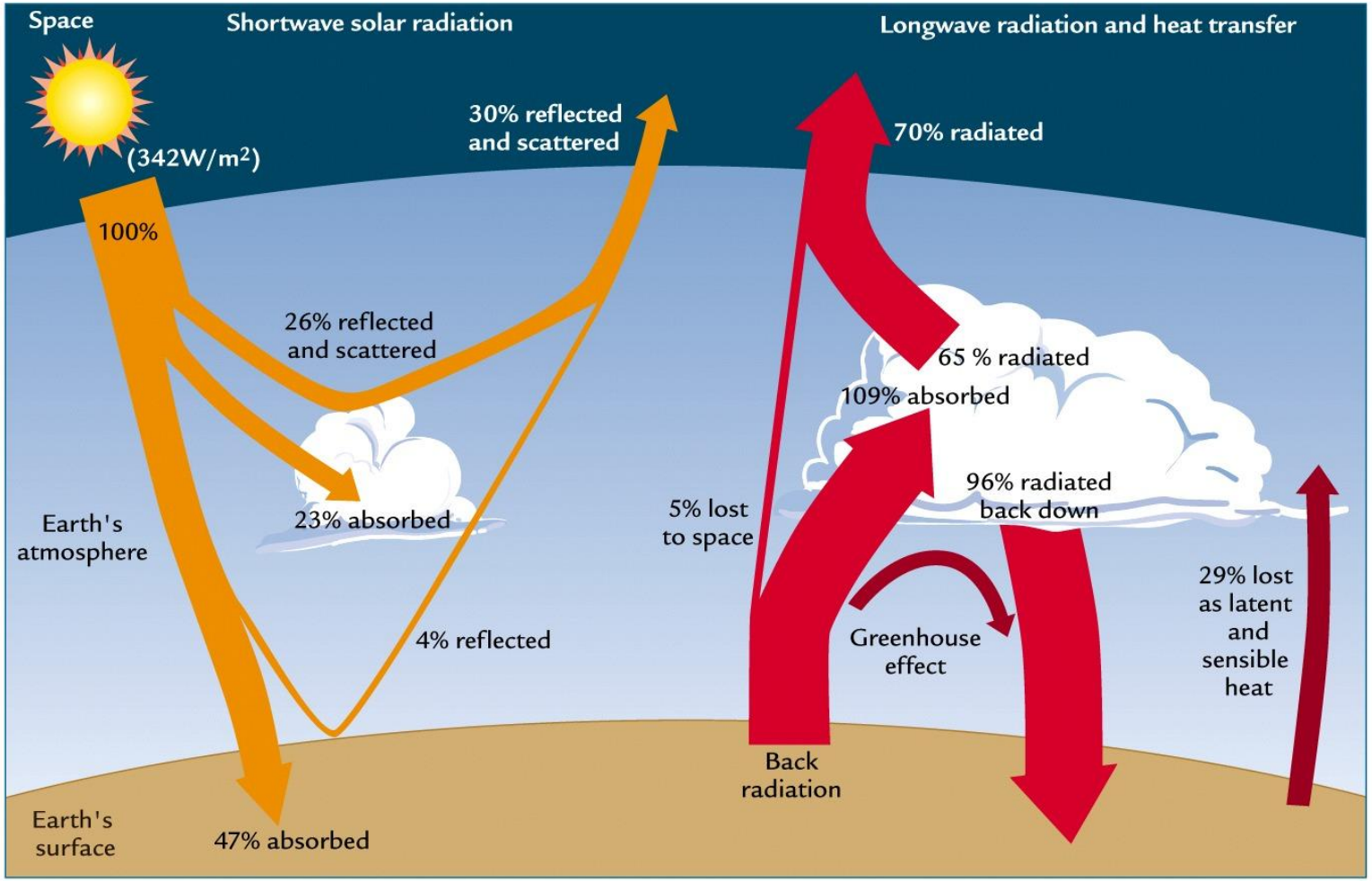
5 layers: Troposphere, Stratosphere, Mesosphere, Thermosphere, & Exosphere

How Does The Sun's Energy Transfer Through Earth's Atmosphere?

Some solar radiation is absorbed and/or reflected by the ionosphere, the ozone layer, and clouds

While additional solar radiation passes through the atmosphere to be absorbed and/or reflected by Earth’s surface

Additionally, as Earth’s surface is unevenly heated, thermal energy transfers from its surface back into the atmosphere generating convection currents


Space
Shortwave solar radiation
Longwave radiation and heat transfer
(342W/m²)
100%
30% reflected and scattered
26% reflected and scattered
23% absorbed
4% reflected
47% absorbed
Earth's atmosphere
Earth's surface
70% radiated
65 % radiated
109% absorbed
96% radiated back down
5% lost to space
Greenhouse effect
Back radiation
29% lost as latent and sensible heat

What are Chlorofluorocarbons (CFCs)?

non-toxic , non flammable chemicals containing atoms of carbon, chlorine, and fluorine

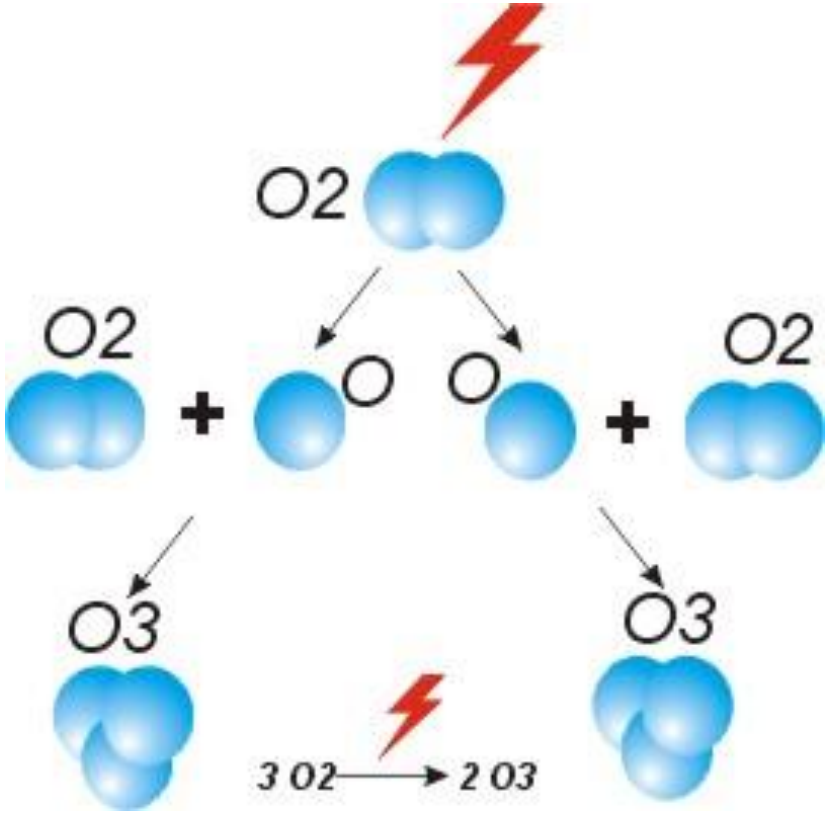
Used in manufacturing of aerosol sprays & have been linked to the hole in our ozone layer

What is the Ozone Layer?

a layer in the Earth's stratosphere containing a high concentration of ozone, which absorbs most of the ultraviolet radiation reaching the earth from the sun.

How Does Ozone Form?

Molecules of ozone are formed when UV radiation strikes atmospheric oxygen (O_2) creating ozone (O_3)


O2
O2
O
O
O2
O3
O3
3 O2 → 2 O3

What is Radiation?

Energy that is radiated or transmitted in the form of rays, waves, or particles

What is Conduction?

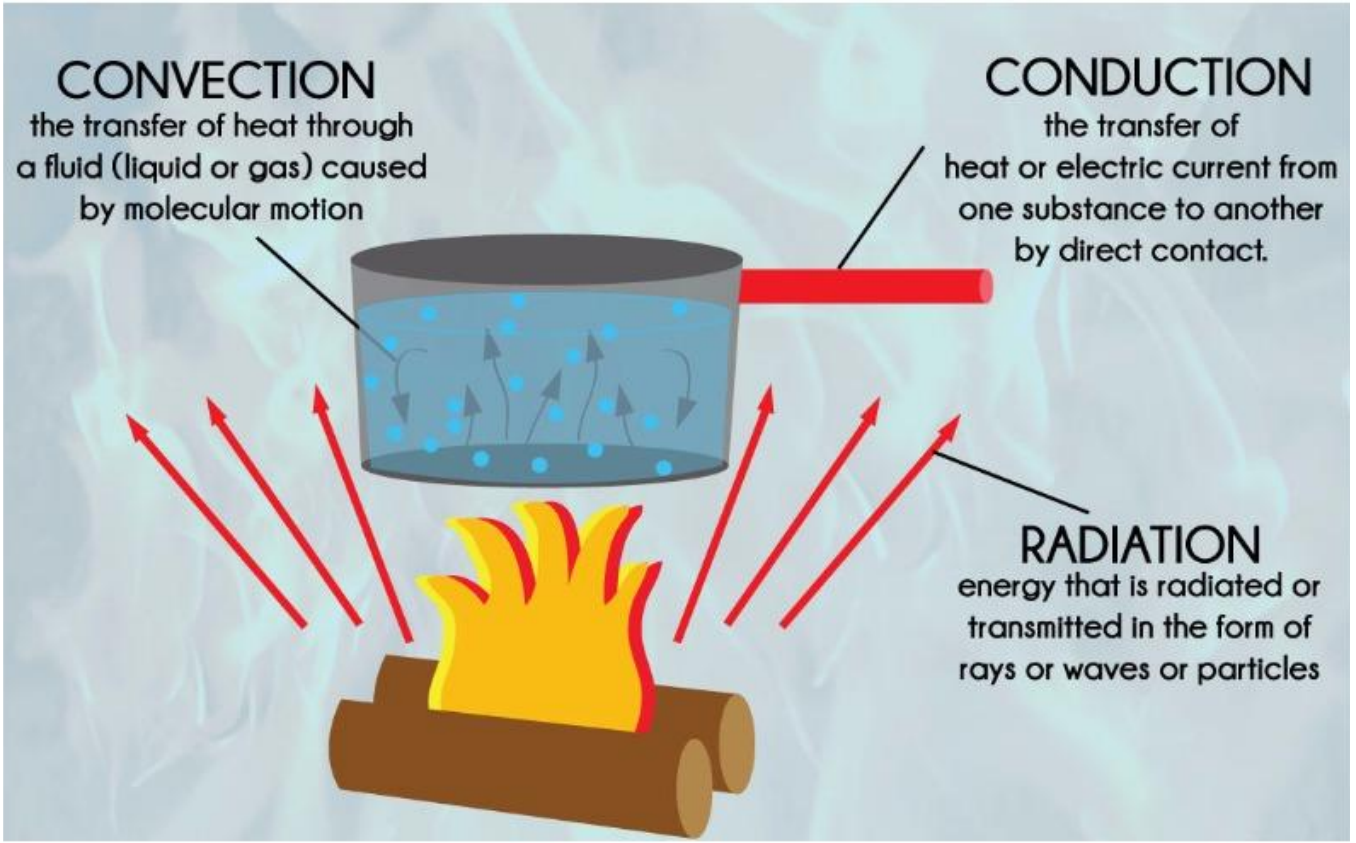
The transfer of heat or electrical current from one substance to another through direct contact

What is Convection?

The transfer of heat through a fluid (liquid, or gas) caused by molecular motion

What is Heat?

The transfer of thermal energy from a region of higher temperature to a region of lower temperature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