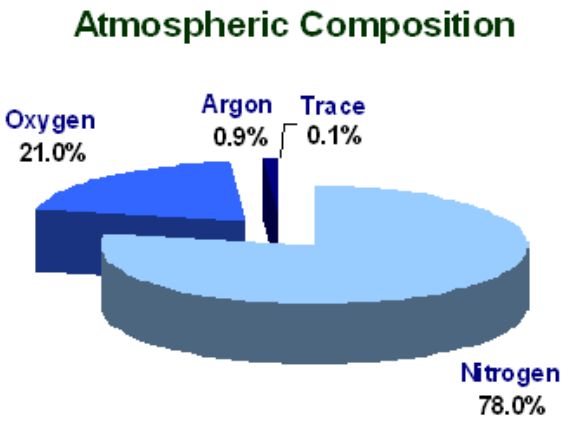

Atmosphere
Formation
Composition
Role
Layers

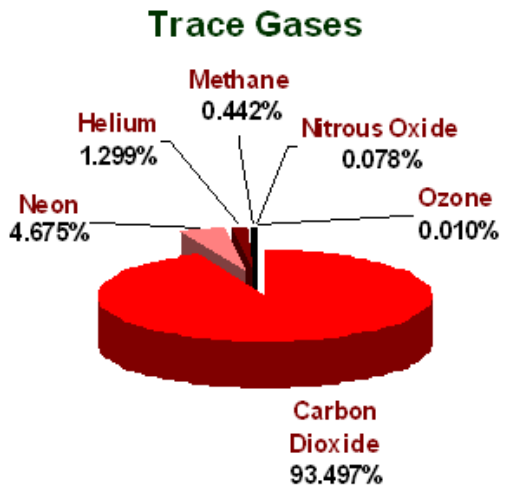
Atmosphere Formation

- **More than 4 billion years ago**
- **Via volcanic eruptions (H_2O, CO, CO_2, HCl, CH_4, NH_3, N_2, SO_x)**
  - **H_2O condensed & precipitated**
  - **Carbon sequestered in rocks**

Current Atmosphere

- **Composition:**
  - **Nitrogen (~78%)**
  - **Oxygen (~21%)**
  - **H_2O, Ar, CO_2 (~1% combined)**
  - **Ozone, CH_4, & others (trace)**

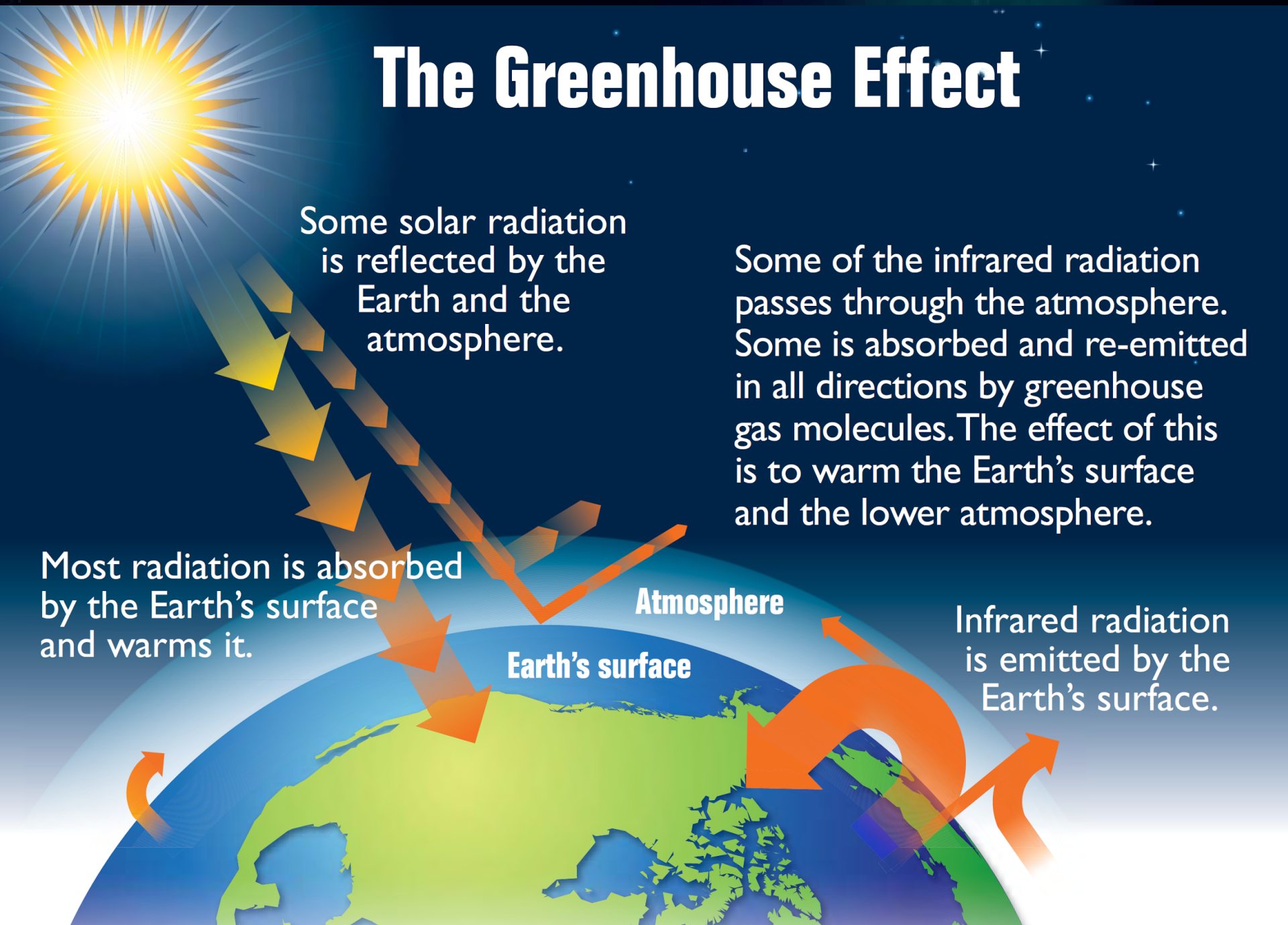




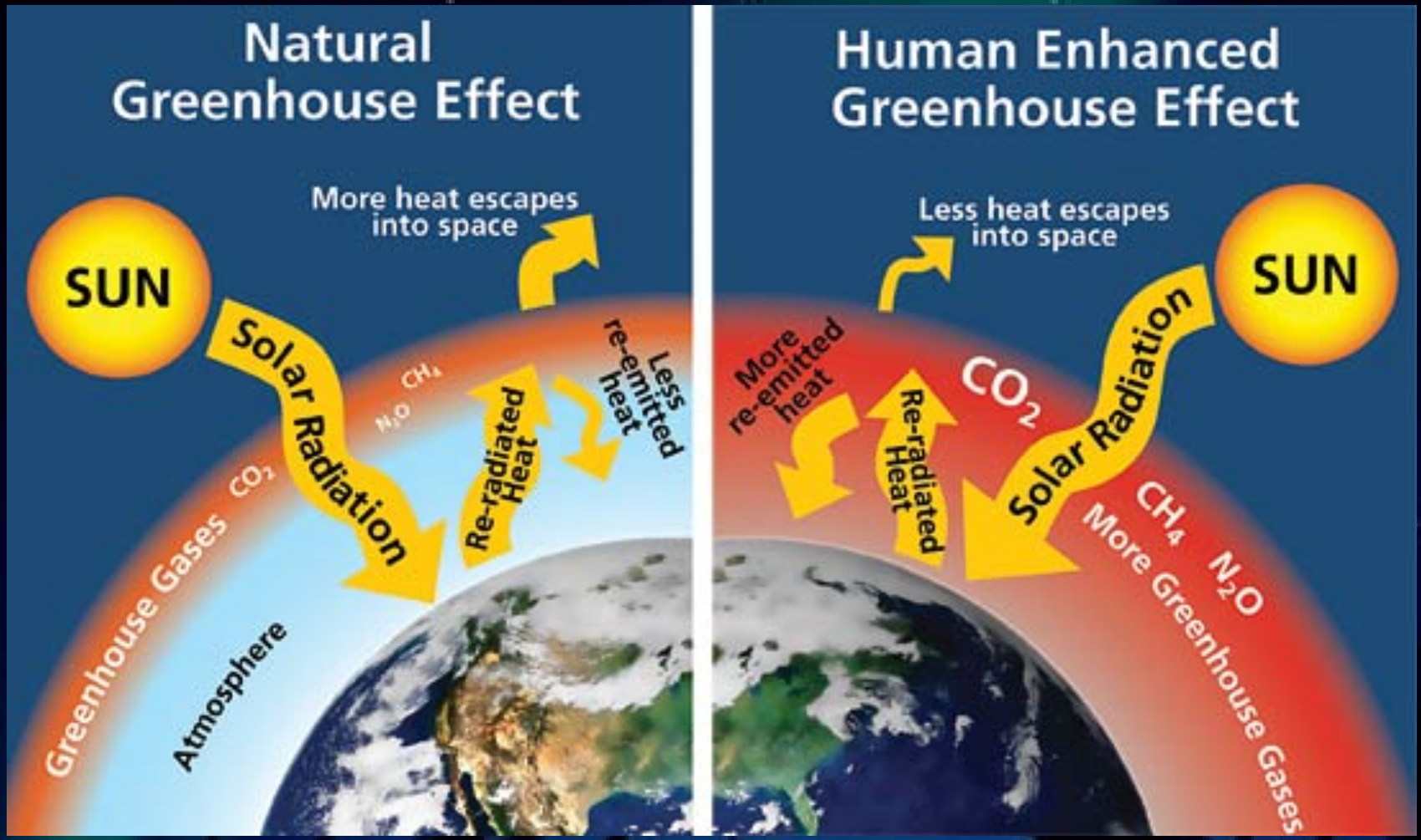
Roles of the Atmosphere

- **Reservoir of gases for photosynthesis & respiration**
- **Global transfer of heat & moisture**
- **Moderation of Earth's temperature via natural greenhouse effect**
- **Absorption of solar radiation**

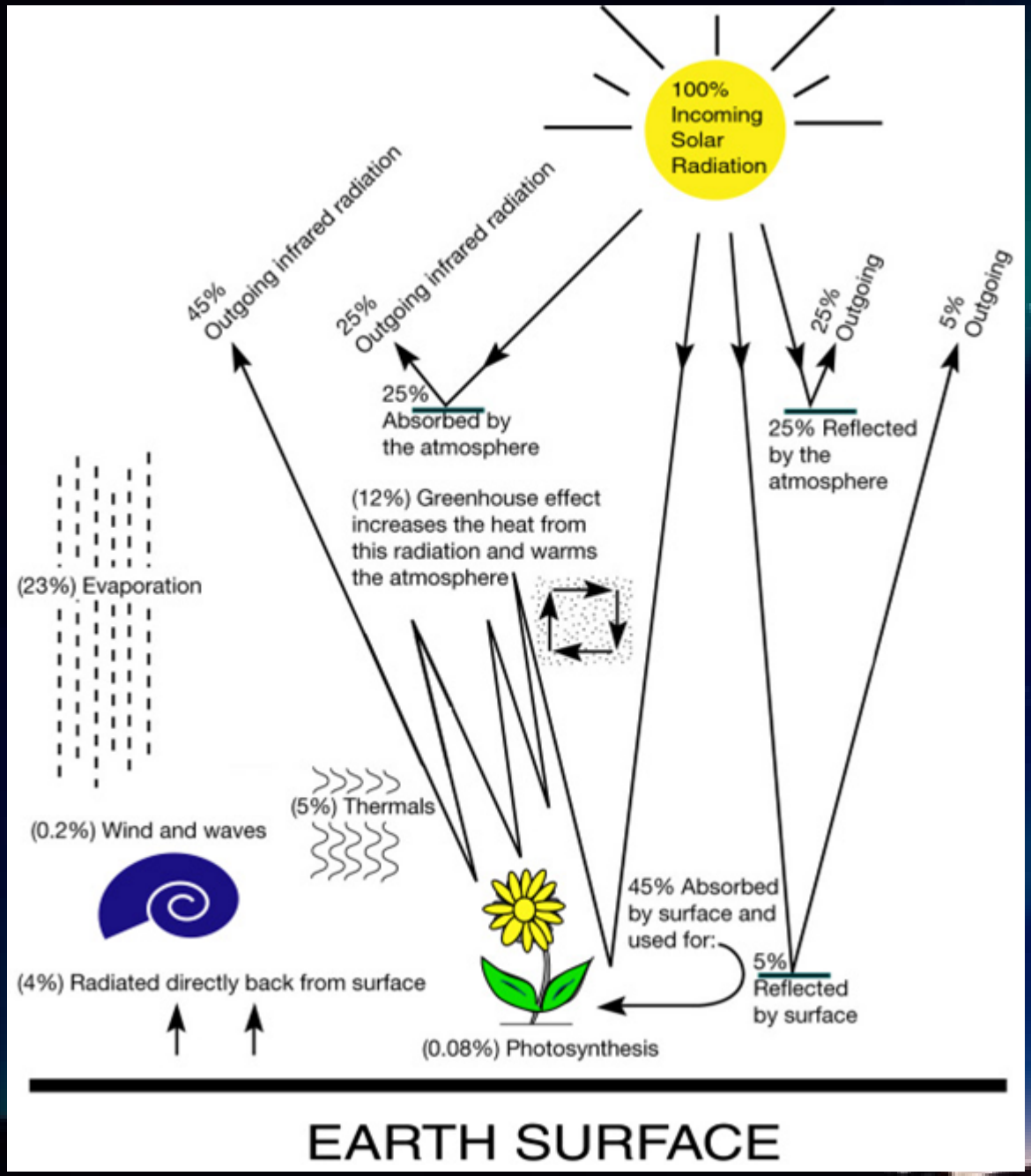
The Greenhouse Effect



Greenhouse Effect

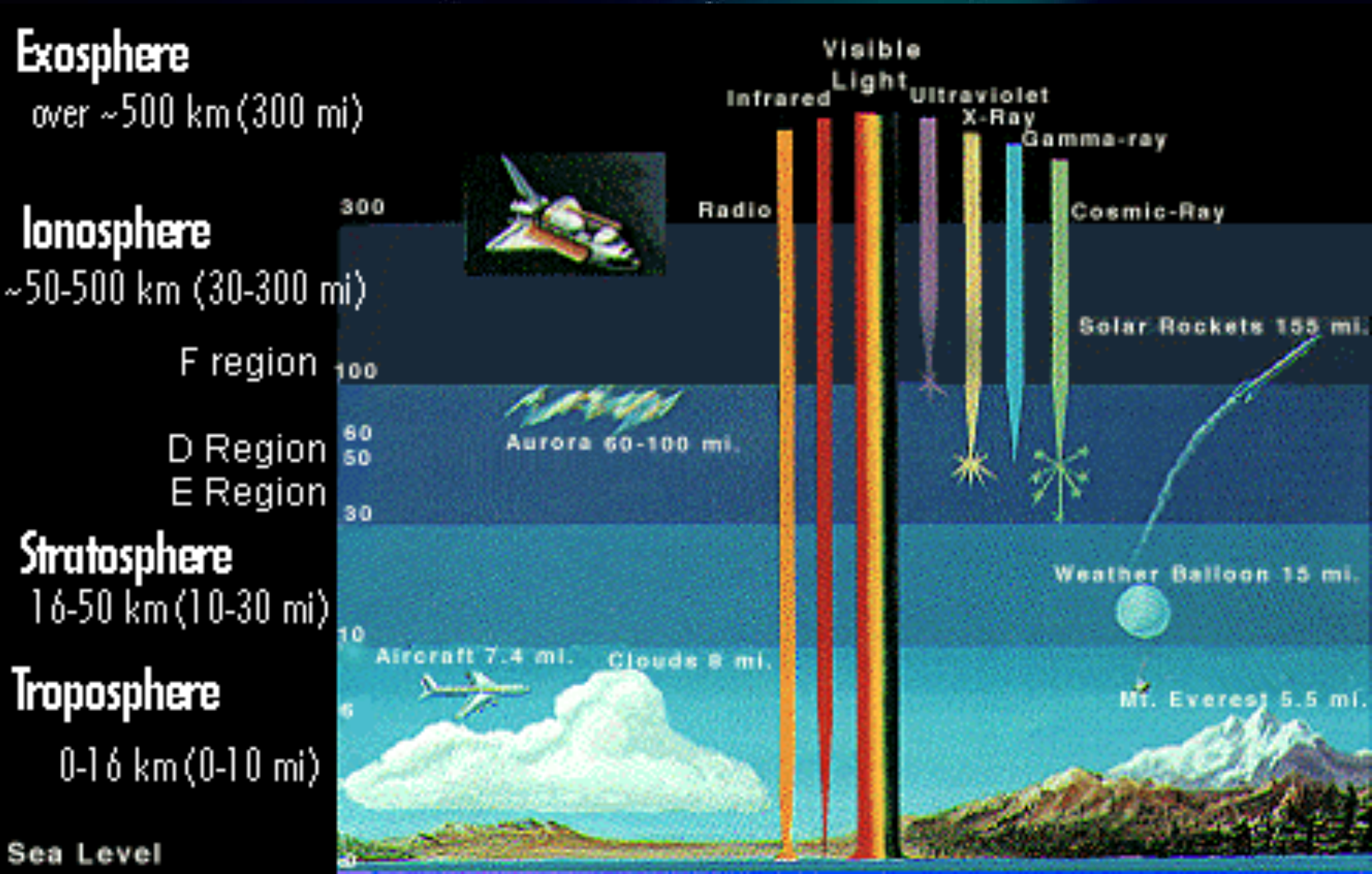


How does nature's cooling process at Earth's surface balance the heating effect of greenhouse gases?

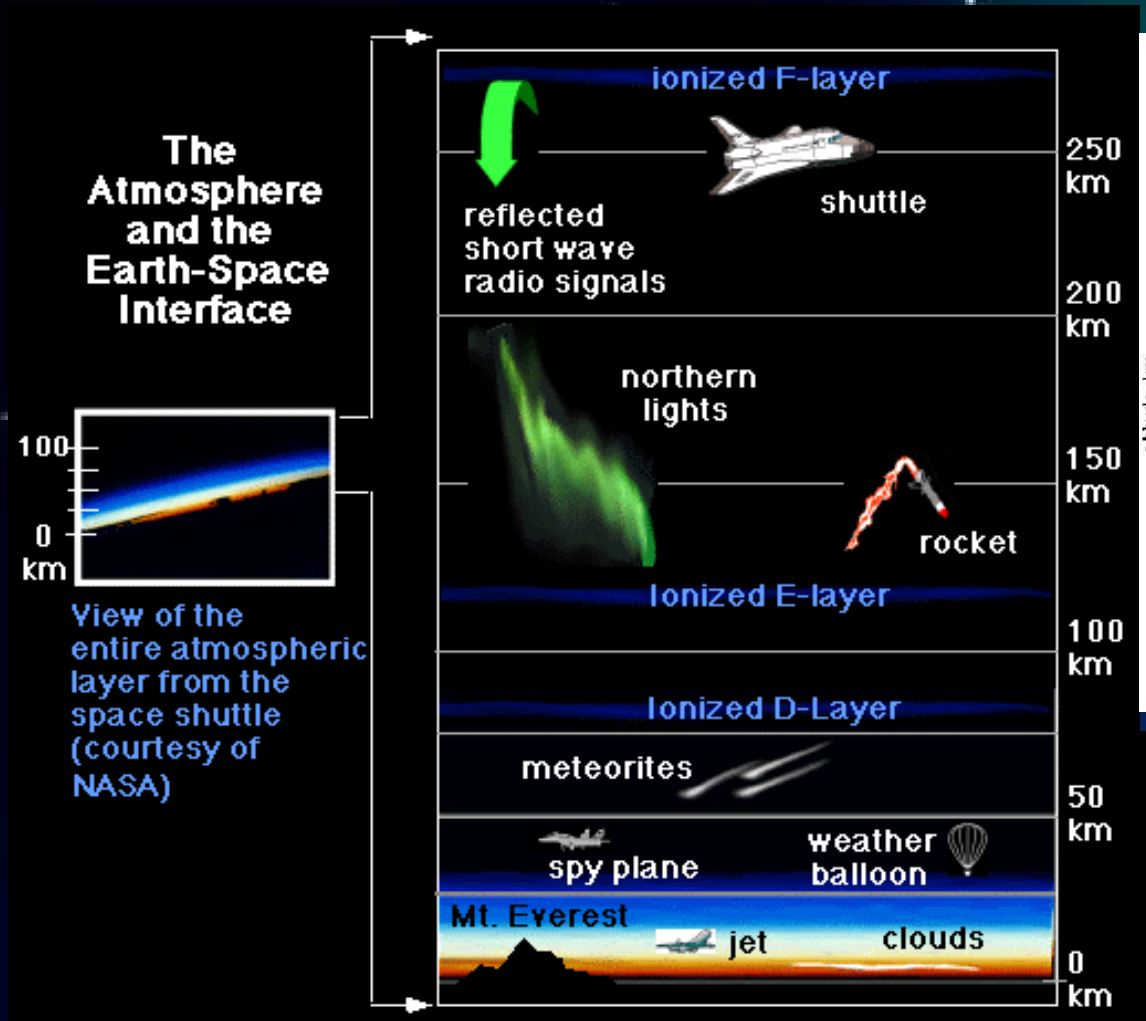


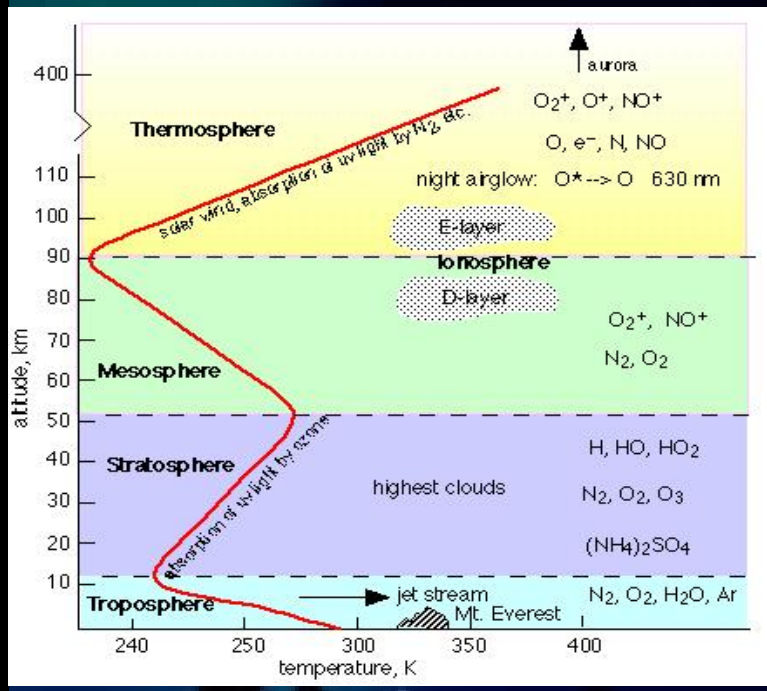
Most absorption of ultraviolet radiation from the sun occurs in the stratosphere.

Absorption of Solar Radiation



Layers of the Atmosphere





Ionosphere/exosphere; is composed mostly of very low density helium and hydrogen