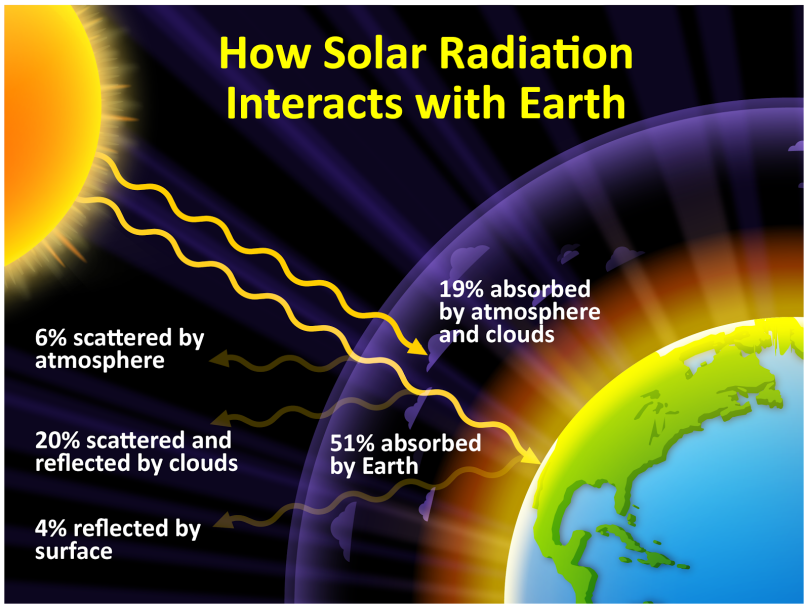
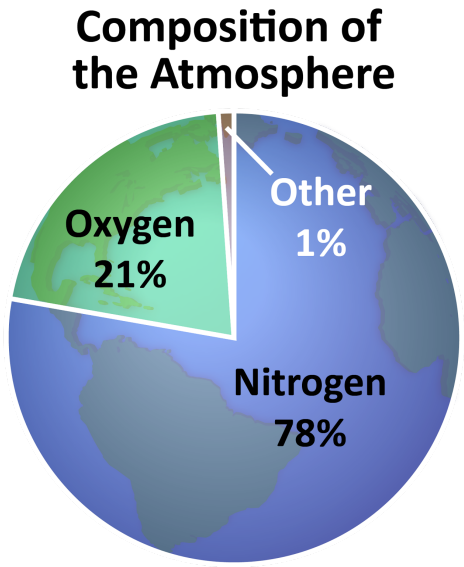
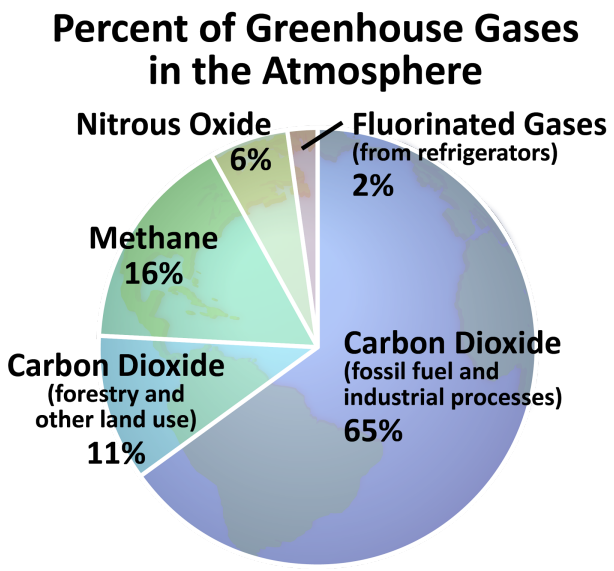
How Our Earth System Stays Not Too Hot and Not Too Cold

The Sun provides the energy that plants and animals need in order to live. This energy is called *solar radiation*. Land, water, and clouds reflect some of the solar radiation from the Sun back into the atmosphere.



The gases around Earth (known as the atmosphere) absorb some of the solar radiation. The gases in the atmosphere that absorb solar radiation are called *energy-absorbing gases* or *greenhouse gases*. Nitrogen and oxygen make up most of the atmosphere, but nitrogen and oxygen are not greenhouse gases. The greenhouse gases in the atmosphere are carbon dioxide (CO_2), water, methane, nitrous oxide, and fluorinated gases. Carbon dioxide is the most abundant greenhouse gas.





Credit: EPA, U.S. Department of Energy
Source: IPCC (2014)

When the energy-absorbing gas particles absorb the solar radiation, they move faster. The faster moving gas particles cause the temperature of the air to increase. This warming effect is sometimes called the *greenhouse effect*. The warming effect is important because it keeps the Earth warm enough for plants and animals, including humans, to live.

In the past 100 years, there has been a major increase in the amount of CO_2 in the atmosphere. With more CO_2 in the atmosphere, the Earth's atmosphere is getting warmer and warmer. Even a little extra warming can cause problems for humans, plants, and animals.

In the remainder of this unit, you will learn:

- How scientists know the CO_2 in the atmosphere has increased and why
- How increased CO_2 and the warming atmosphere influences living and nonliving systems
- What we can do about increased CO_2 and the warming atmosphere