

How does the atmosphere resemble a greenhouse?

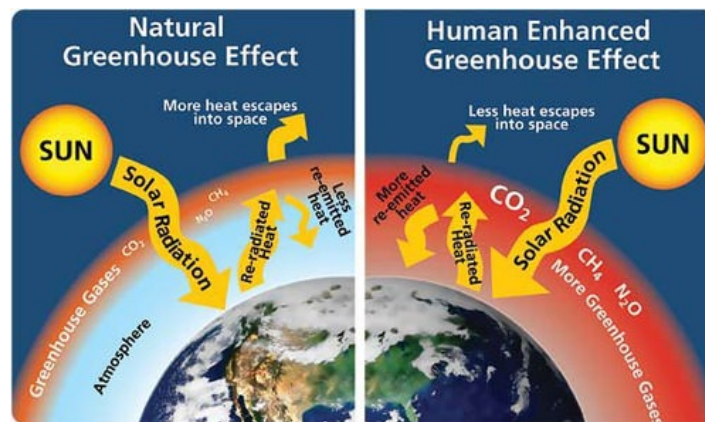


Farmers use greenhouses to extend the growing season. A greenhouse traps **heat**. Days that are too cool for a growing plant can be made to be just right. Similar to a greenhouse, greenhouse gases in the atmosphere keep Earth warm.

The Greenhouse Effect

When sunlight heats Earth's surface, some of the **heat** radiates back into the atmosphere. Some of this heat is absorbed by gases in the atmosphere. This is the **greenhouse effect**, and it helps to keep Earth warm. The greenhouse effect allows Earth to have temperatures that can support life.

Gases that absorb **heat** in the atmosphere are called **greenhouse gases**. They include carbon dioxide and **water** vapor. Human actions have increased the levels of greenhouse gases in the atmosphere (**Figure below**). The added gases have caused a greater greenhouse effect. How do you think this affects Earth's **temperature**?



Human actions have increased the natural greenhouse effect.

Like a blanket on a sleeping person, greenhouse gases act as **insulation** for the planet. The warming of the atmosphere is because of **insulation** by greenhouse gases. Greenhouse gases are the component of the atmosphere that moderate Earth's temperatures.

Greenhouse Gases

Greenhouse gases include CO₂, H₂O, methane, O₃, nitrous oxides (NO and NO₂), and chlorofluorocarbons (CFCs). All are a normal part of the atmosphere except CFCs. The table below shows how each greenhouse **gas** naturally enters the atmosphere (**Table below**).

| Greenhouse Gas | Source |
|---------------------|--|
| Carbon dioxide | Respiration, volcanic eruptions, decomposition of plant material; burning of fossil fuels. |
| Methane | Decomposition of plant material. |
| Nitrous oxide | Produced by bacteria |
| Ozone | Atmospheric processes |
| Chlorofluorocarbons | Not naturally occurring; made by humans |

Different greenhouse gases have different abilities to trap heat. For example, one methane molecule traps 23 times as much heat as one CO₂ molecule. One CFC-12 molecule (a type of CFC) traps 10,600 times as much heat as one CO₂. Still, CO₂ is a very important greenhouse **gas**, because it is much more abundant in the atmosphere.

Summary

- Greenhouse gases include CO₂, H₂O, methane, O₃, nitrous oxides (NO and NO₂), and chlorofluorocarbons (CFCs).
- Greenhouse gases trap heat in the **troposphere**. Some greenhouse gases can trap more heat than others.
- Levels of greenhouse gases in the atmosphere are increasing due to human activities.