

# Earth Science II

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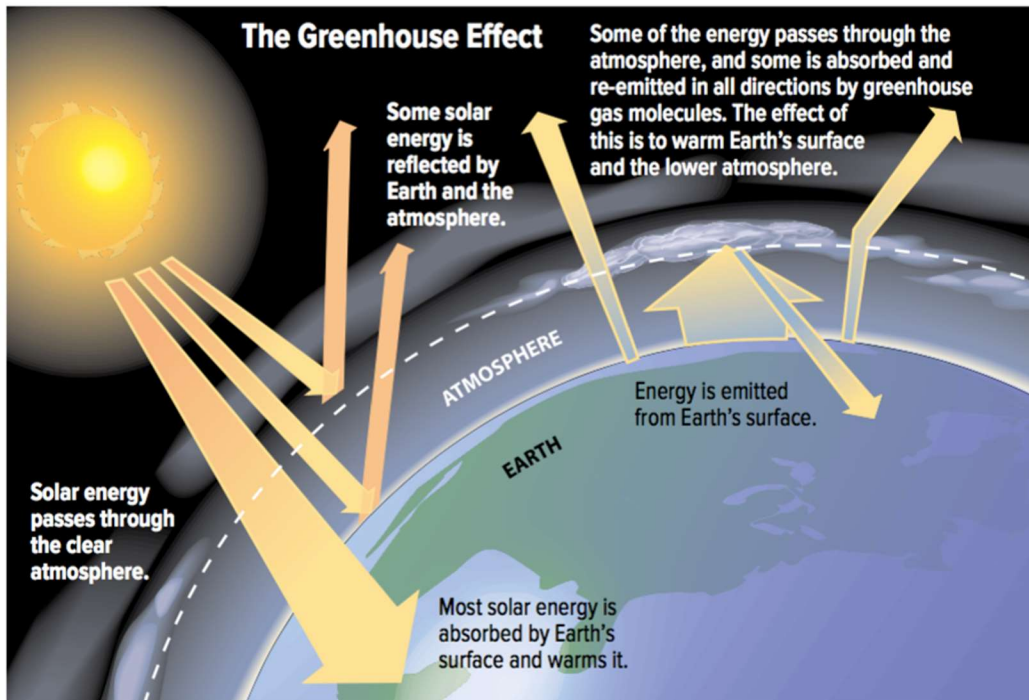
Date:

Block:

1. Solar Energy
2. Winds
3. Ocean Currents

## Solar Energy

Solar energy comes from the \_\_\_\_\_. The solar energy that reaches Earth can either be \_\_\_\_\_ and/or \_\_\_\_\_ by Earth's \_\_\_\_\_ and its \_\_\_\_\_.



Within Earth's atmosphere, there are a number of \_\_\_\_\_ that help to trap \_\_\_\_\_ and keep the Earth's \_\_\_\_\_.

Greenhouse gases absorb solar energy in Earth's atmosphere. Greenhouse gases can occur both naturally and through human activities.

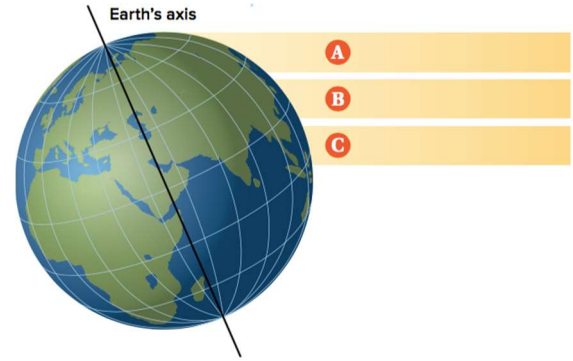
Table 4.3 Natural Greenhouse Gases

Greenhouse Gas	Sources	Other Details
water vapour	<ul style="list-style-type: none"> <li>evaporation from water</li> <li>given off by plants, animals, and other organisms</li> </ul>	<ul style="list-style-type: none"> <li>most abundant greenhouse gas</li> <li>produced during cellular respiration and certain plant processes</li> </ul>
carbon dioxide	<ul style="list-style-type: none"> <li>living organisms</li> <li>volcanoes, forest fires, decaying organisms, release from oceans</li> </ul>	<ul style="list-style-type: none"> <li>second most abundant greenhouse gas</li> <li>produced in and by the cells of most living organisms through cellular respiration</li> </ul>
methane	<ul style="list-style-type: none"> <li>certain species of bacteria and other micro-organisms that live in and around bogs, wetlands, melting permafrost</li> <li>certain species of bacteria that live in the gut of animals such as cows and termites</li> <li>vents and other openings in Earth's crust on land and the ocean floor</li> </ul>	<ul style="list-style-type: none"> <li>a by-product of cellular processes used by some micro-organisms to extract energy from food in the absence of oxygen</li> </ul>
nitrous oxide	<ul style="list-style-type: none"> <li>bacteria that live in oceans and wet, warm soils such as those in the tropics</li> </ul>	<ul style="list-style-type: none"> <li>produced when certain species of bacteria break down nitrogen-rich compounds for food</li> </ul>

Greenhouse Gases from Human Activities	Sources
Carbon dioxide	<ul style="list-style-type: none"> <li>Released from burning fossil fuels (coal, natural gas, oil)</li> </ul>
Nitrous oxide	<ul style="list-style-type: none"> <li>Enters the atmosphere when fertilizers are applied to crops</li> </ul>
Methane	<ul style="list-style-type: none"> <li>Released in large amounts by herds of cattle</li> </ul>

## Winds

Winds occur when the \_\_\_\_\_ of the Earth is \_\_\_\_\_ . The reason why Earth's surface is heated unevenly is because of Earth's \_\_\_\_\_ . The Earth is closer to the Sun at the equator which will result in more solar energy reaching that part of the Earth; this will cause areas at the \_\_\_\_\_ to be \_\_\_\_\_. Less direct sunlight is able to reach the north and south poles of the Earth; this will cause areas at the \_\_\_\_\_ to be \_\_\_\_\_ .

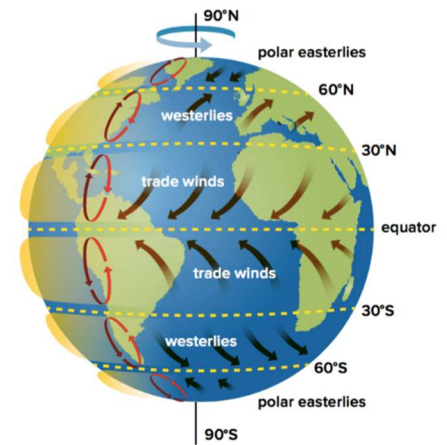


\_\_\_\_\_ air (less dense) near the Earth's surface \_\_\_\_\_ and eventually cool downs while \_\_\_\_\_ air is \_\_\_\_\_ and \_\_\_\_\_. This movement of the air is what causes winds to form. This phenomenon is called \_\_\_\_\_ .

Along with the rising and sinking of the air, the \_\_\_\_\_ plays a part in how wind is distributed around the Earth. The Coriolis effect occurs due to \_\_\_\_\_ ; Earth tends to rotate faster at the equator than at the poles. The Coriolis effect makes things (like planes or air) travelling around the Earth appear to move in a curved fashion.

There are three major types of winds that the Earth has:

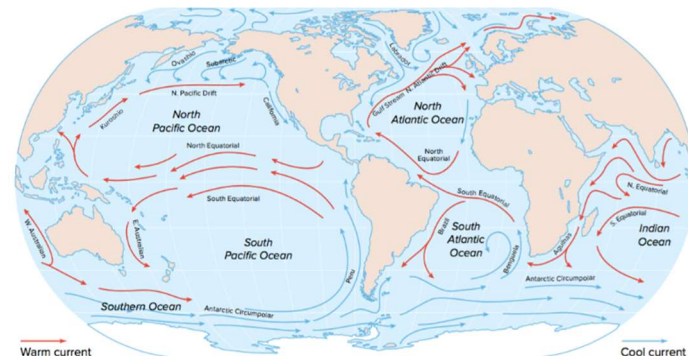
1. \_\_\_\_\_ :
  - Move east to west
  - Air near the equator warms, rises, and travels north or south
  - At the north or south, the air cools, sinks, and moves west
2. \_\_\_\_\_ :
  - Move from west to east
  - Steady winds that move much of the weather across North America
3. \_\_\_\_\_ :
  - Travel from east to west
  - Move cold air from polar regions back toward equator



## Ocean Currents

\_\_\_\_\_ are also able to move thermal energy around the Earth. There are two major types of ocean currents:

1. \_\_\_\_\_
  - a. These are created by the movement of the wind
  - b. Warm currents move heat from the equator to the poles while cold currents move cold water from the poles to the equator



2.

- a. A system of deep water currents that move deep \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ around the Earth
- b. \_\_\_\_\_ of this water is based on the \_\_\_\_\_ of the \_\_\_\_\_ and the \_\_\_\_\_
- i. Cold water is denser than warm water so it will sink; warm water is less dense than cold water so it will rise
  - ii. Saltier water is denser so it will sink and move the less salty water up

