

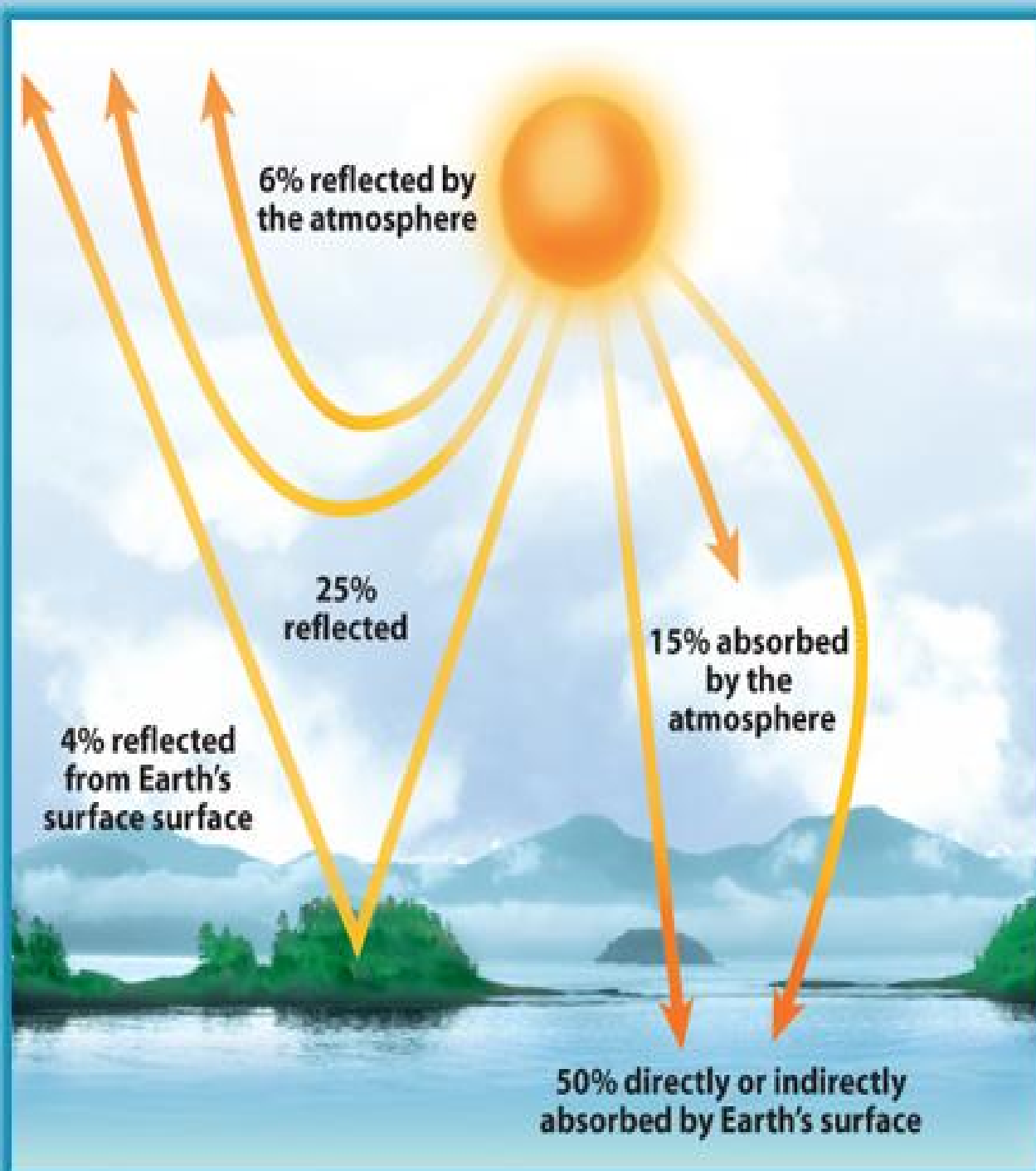
# Energy from the Sun and Wind



# Energy from the Sun

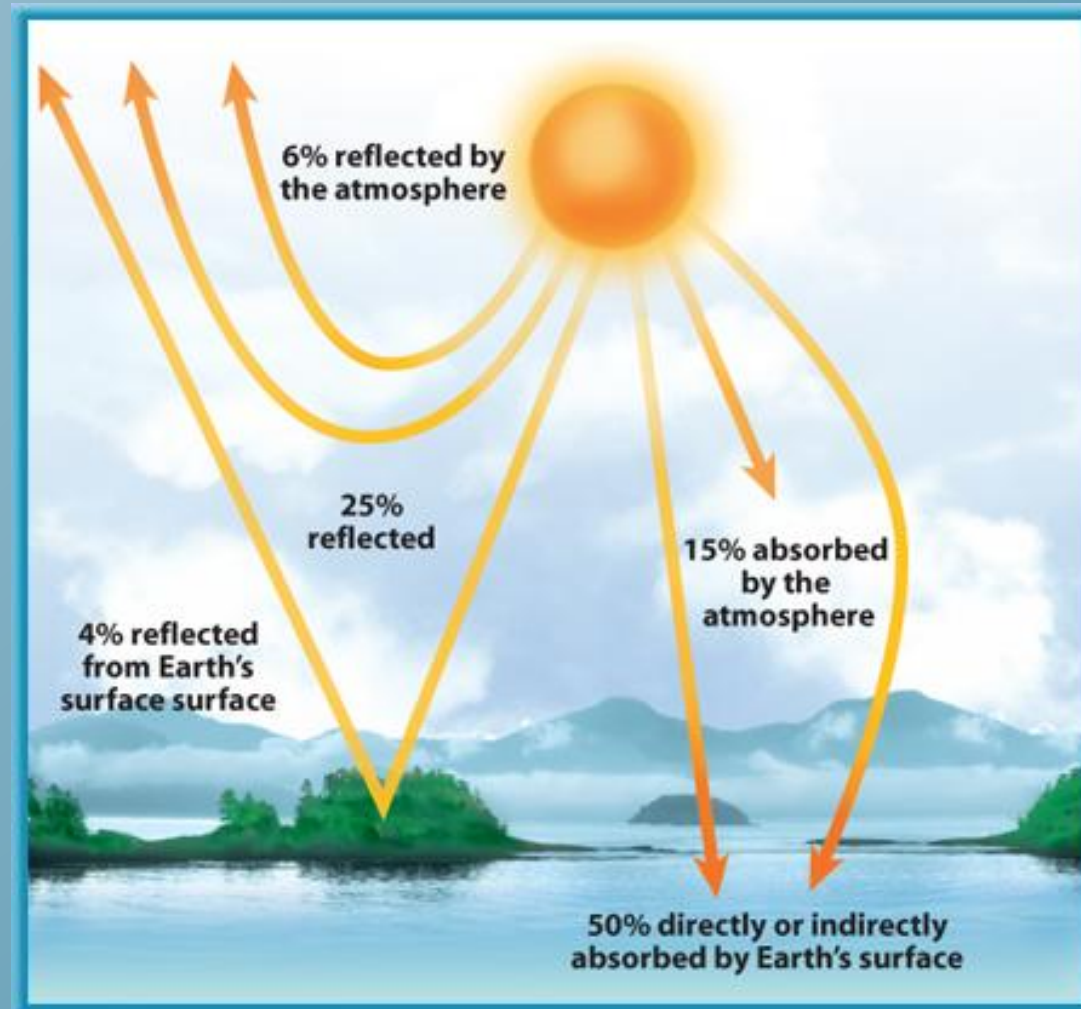
Half of the Sun's radiation reaches Earth's surface

- Land heats more quickly than water
- Land also loses its heat more quickly than water



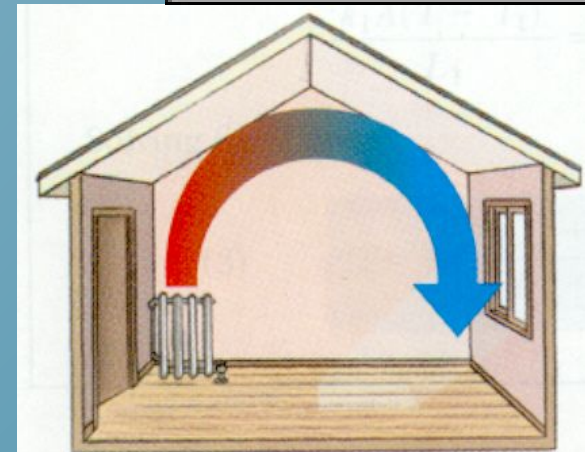
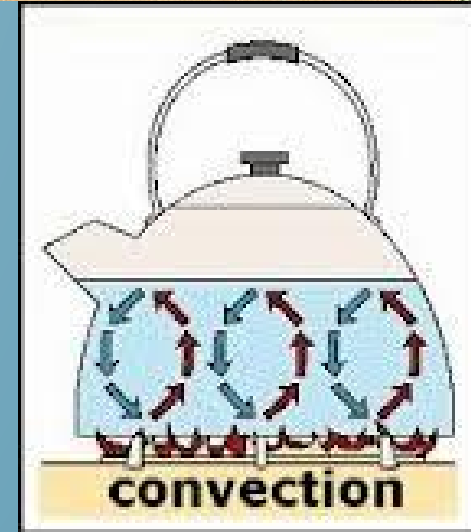
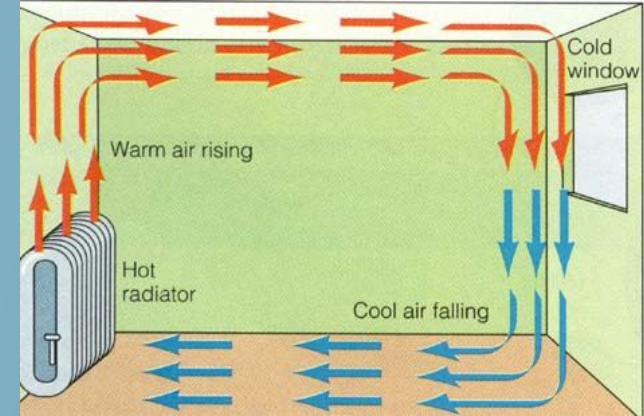
# Why is the Uneven Heating and Cooling of Land and Water Important?

These differences in heating and cooling cause convection currents



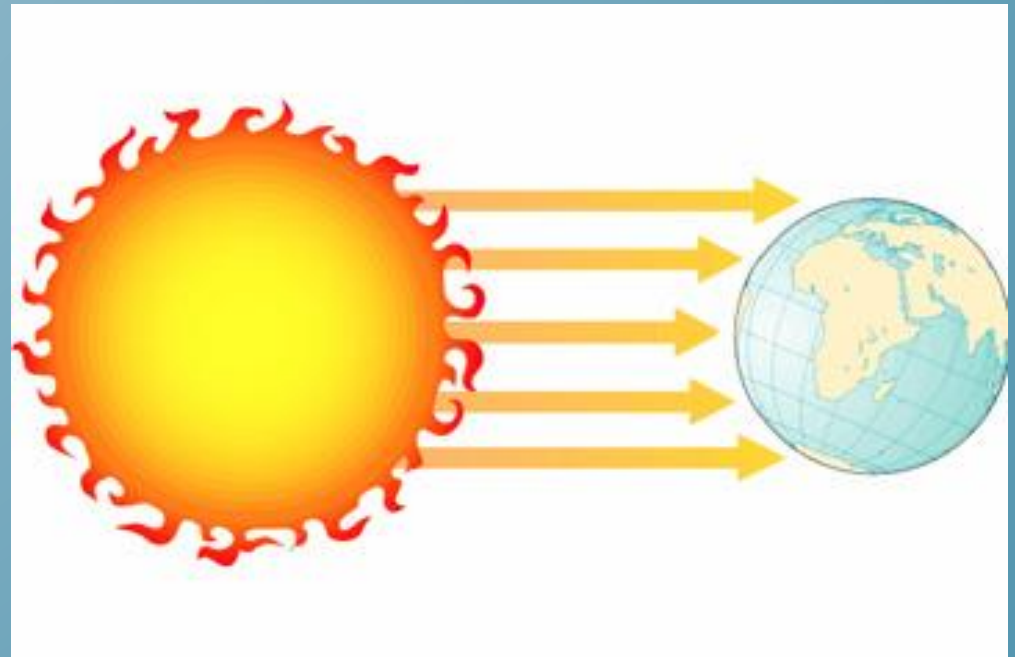
# Convection Currents

- Cooler, denser fluid (including air) sinks while warmer, less dense fluid rises
- This forms a convection current
- Transfers heat from one place to another
- Convection is the driving force in producing winds and ocean currents



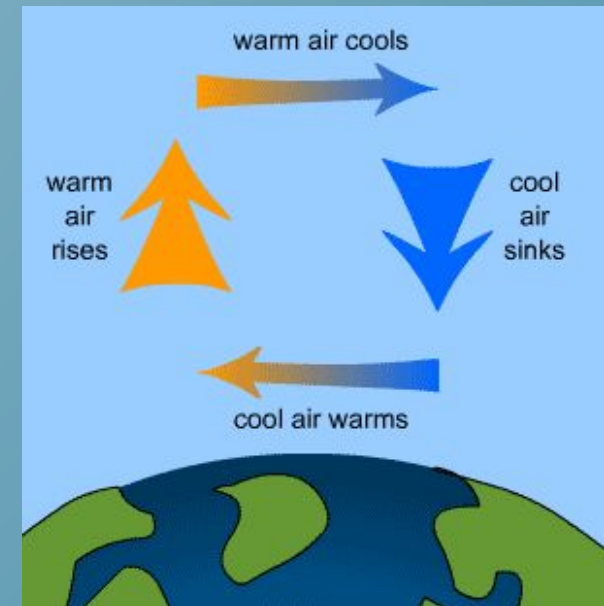
# WIND

- The Earth is in a constant battle to equalize its temperature
- It never succeeds, because our planet is hotter in some places than in others



# WIND PATTERNS

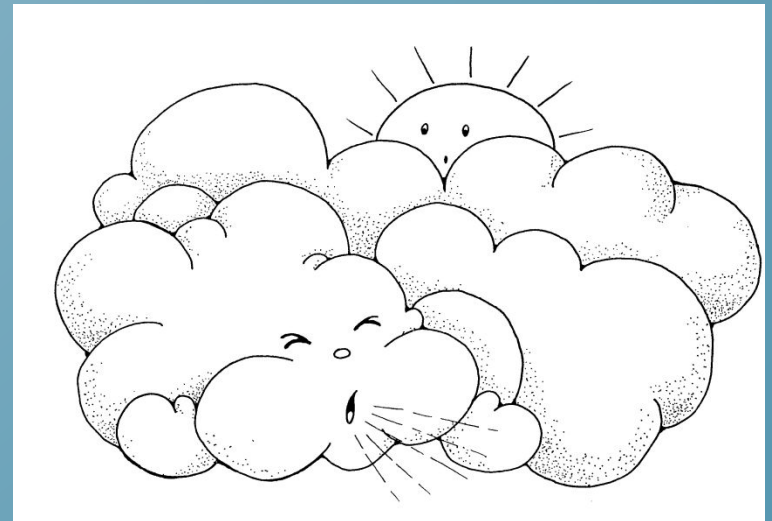
- Earth's air is always on the move
  - Cool air sinks
  - Warm air rises
- Forms convection currents

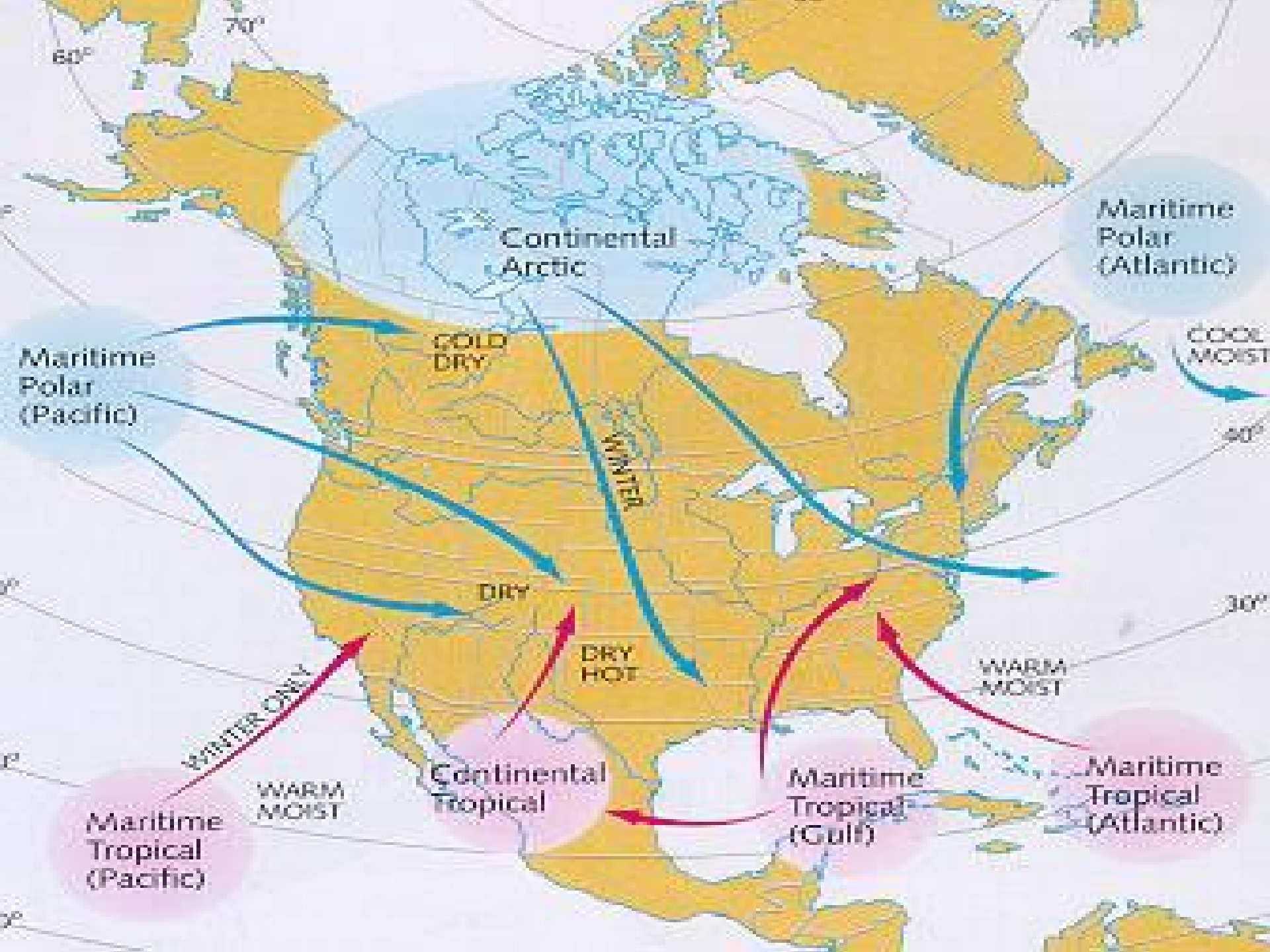




# WIND PATTERNS

- Wind is the movement of air as a result of different air pressure
- The greater the pressure difference, the stronger the wind
- Caused by unequal heating of Earth



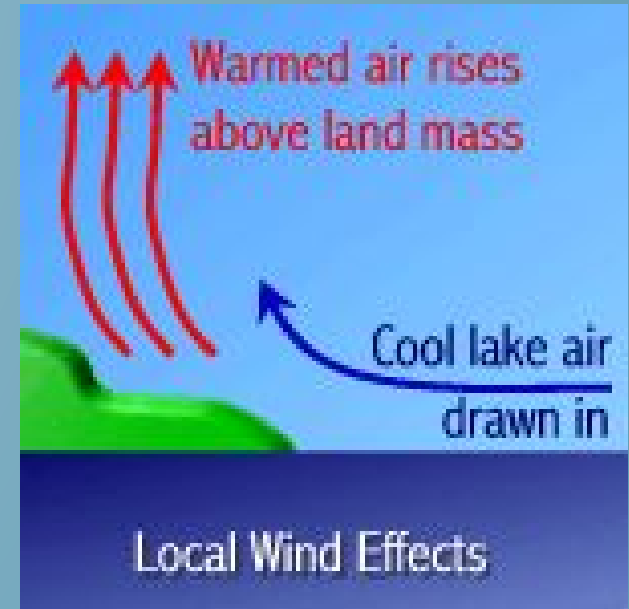




# Types of Winds

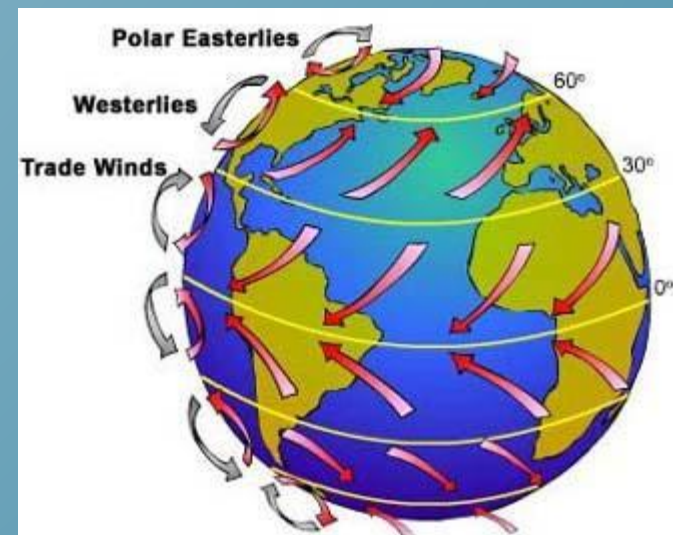
## Local Winds

- generally move short distances and can blow from any direction

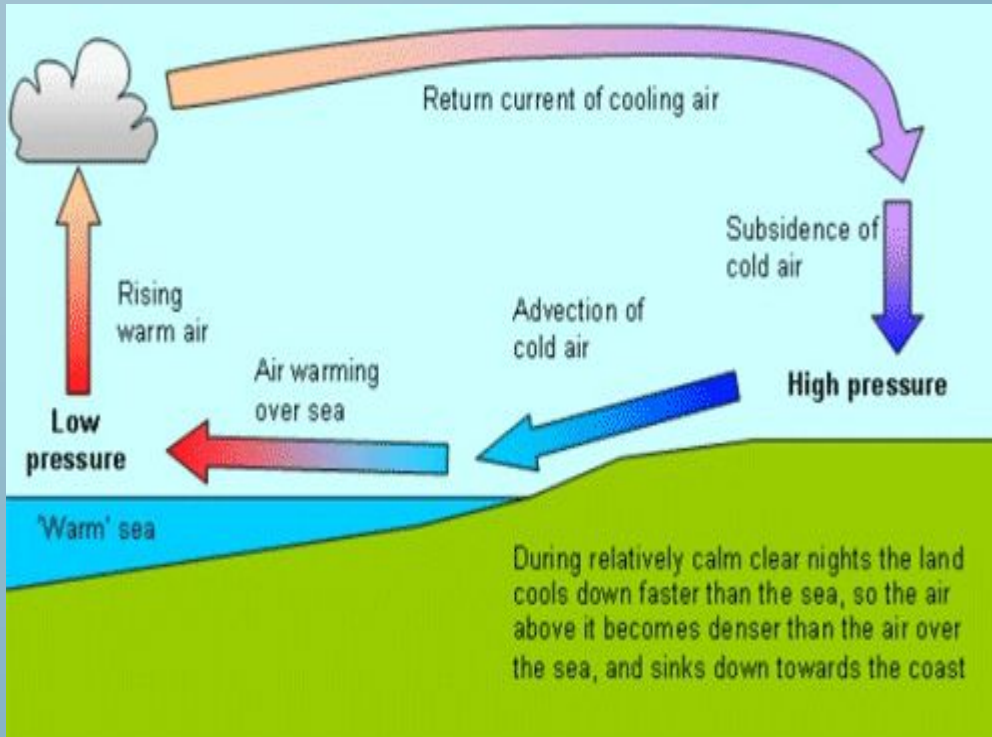


## Global Winds

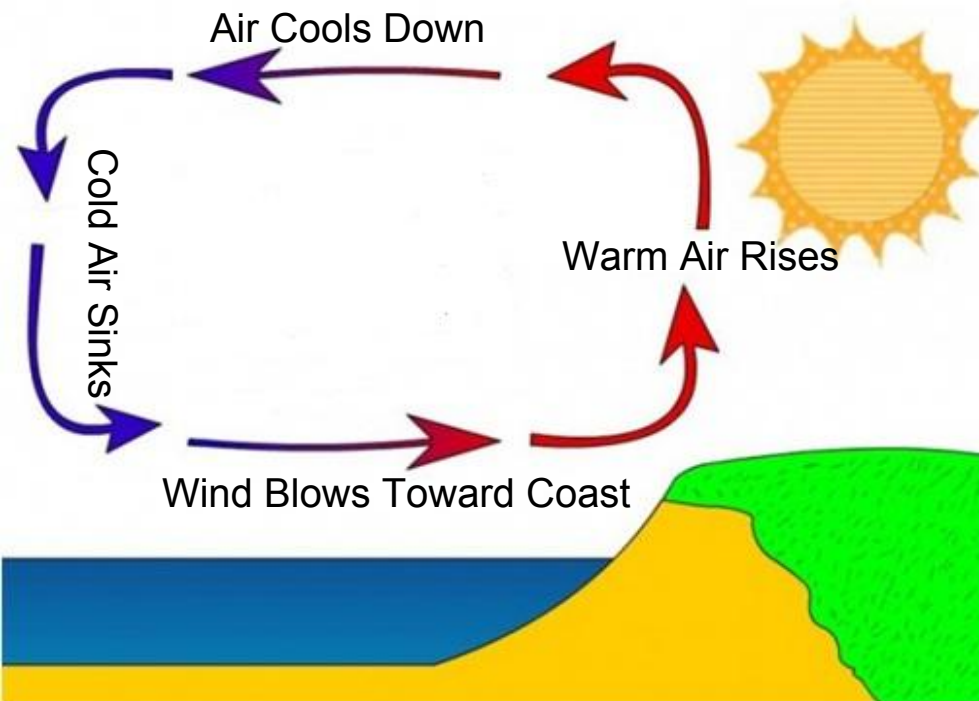
- are part of a pattern of air flow that moves across the Earth



# Local Winds

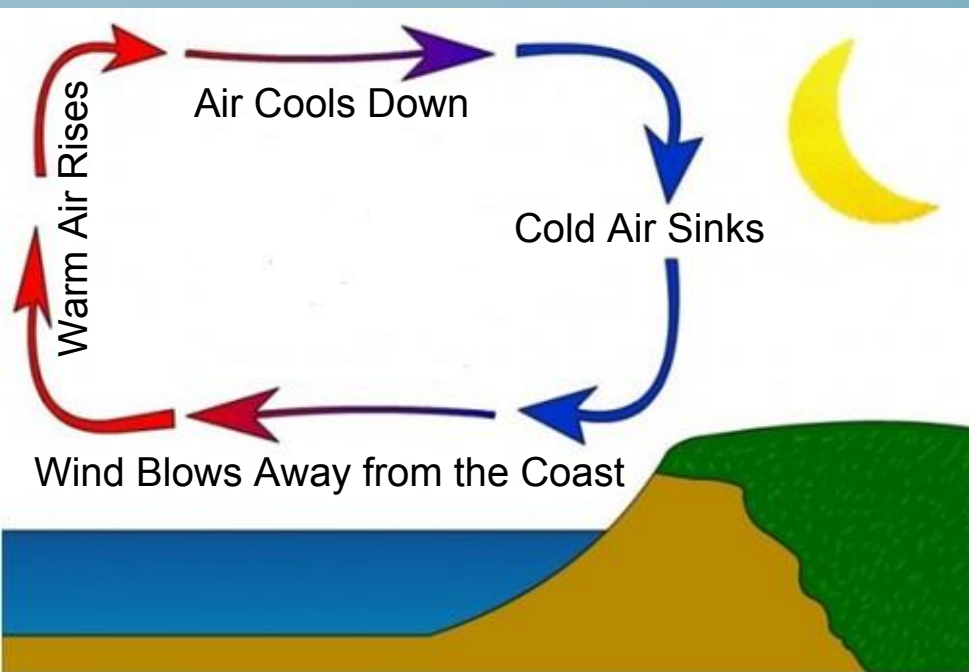


- occur because of the differences in heat of the land and the water
- Examples include land breezes and sea breezes



## Sea Breeze

During the day, the land heats up more quickly than the sea. Above the land, warm air rises and the wind blows toward the coast



## Land Breeze

At night, the land cools down quickly while the sea stays warm. Above the sea, warm air rises and the wind blows away from the coast

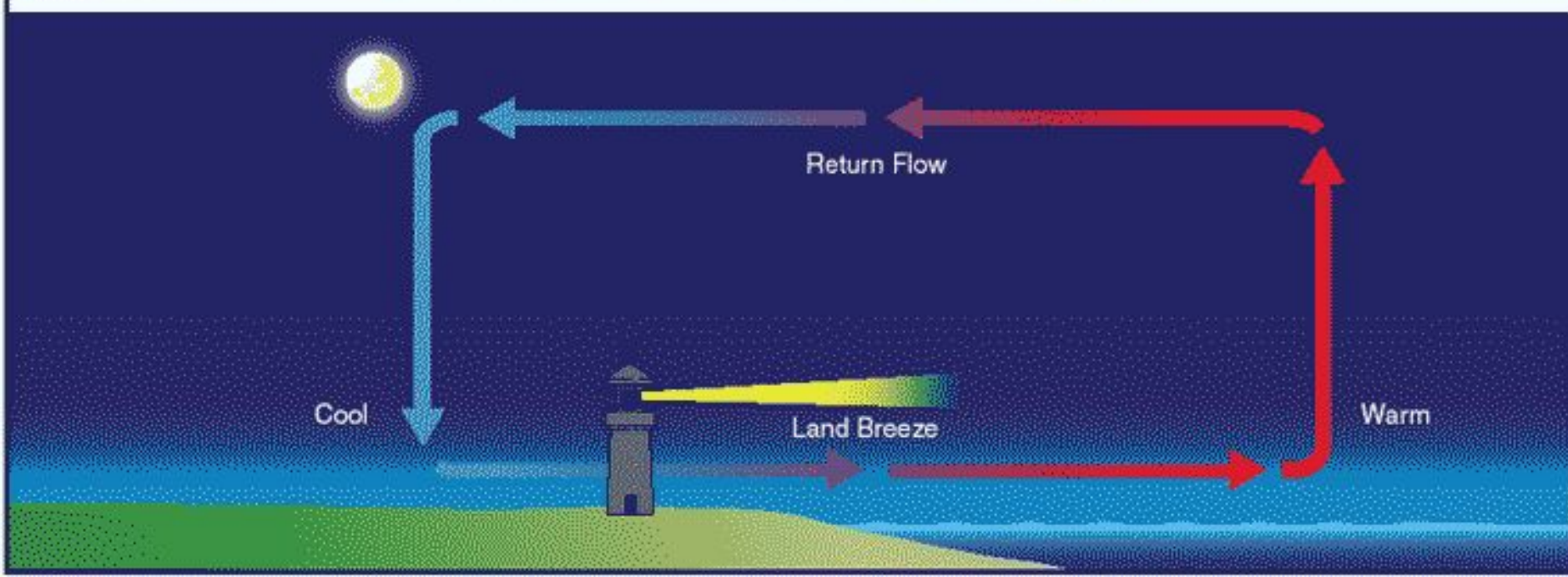
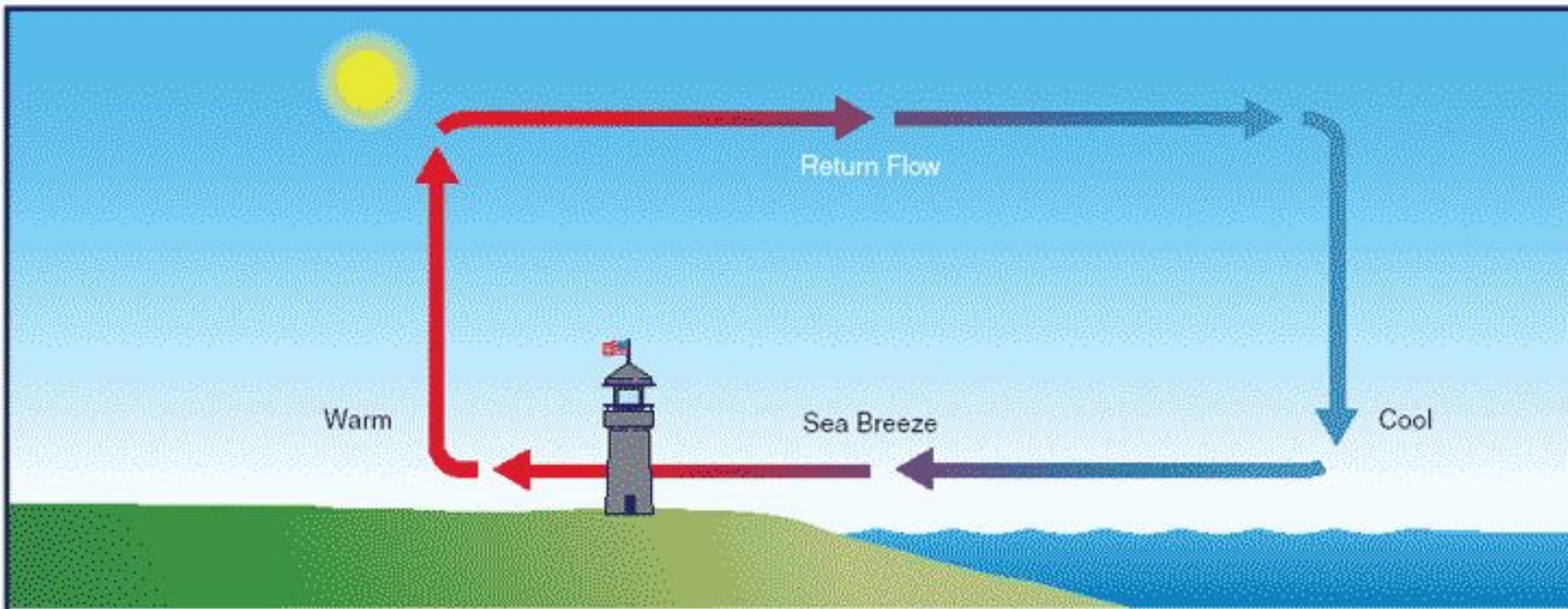


**DAY TIME**



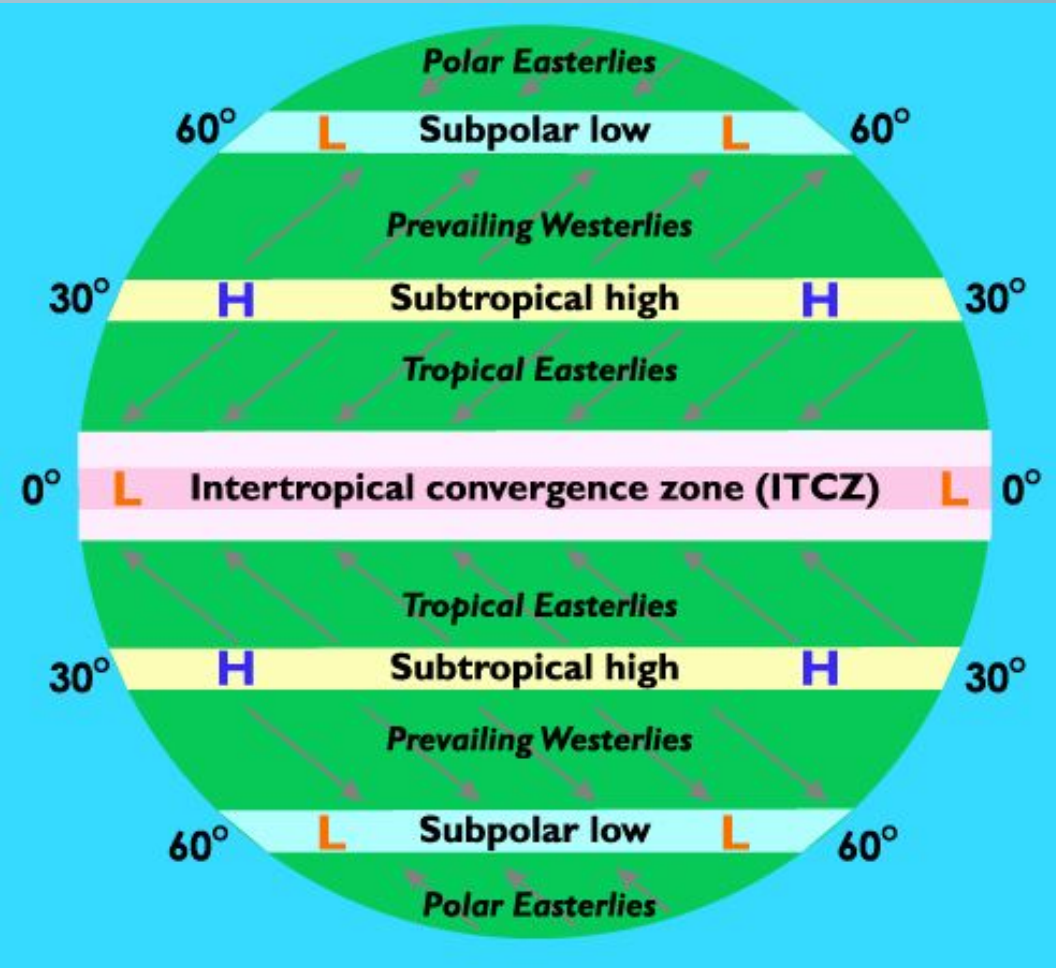
**NIGHT TIME**







# Global Winds



- Coriolis and other factors combine to produce a pattern of wind belts around the Earth
- Examples include tradewinds, easterlies, & westerlies



# Coriolis Effect

Earth rotates as wind blows, making it seem as if the winds are curved

- **Northern Hemisphere** - winds curve to the right
- **Southern Hemisphere** - winds curve to the left

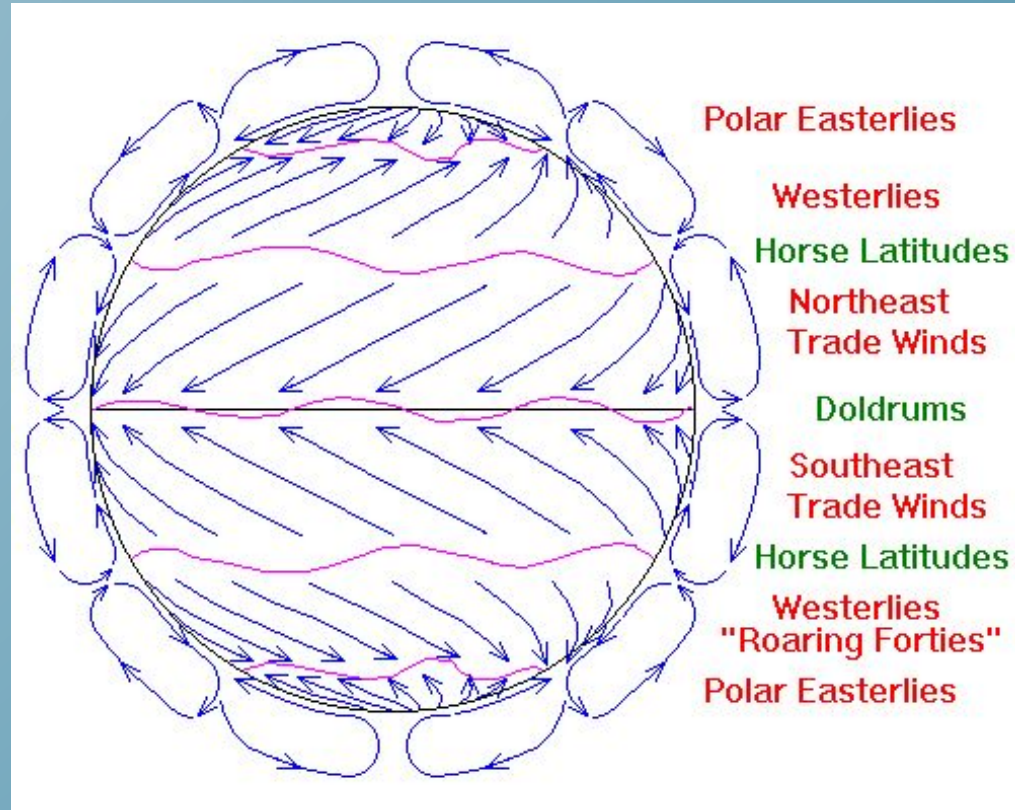
[Coriolis Effect](#)

[Winds and the Coriolis Effect](#)

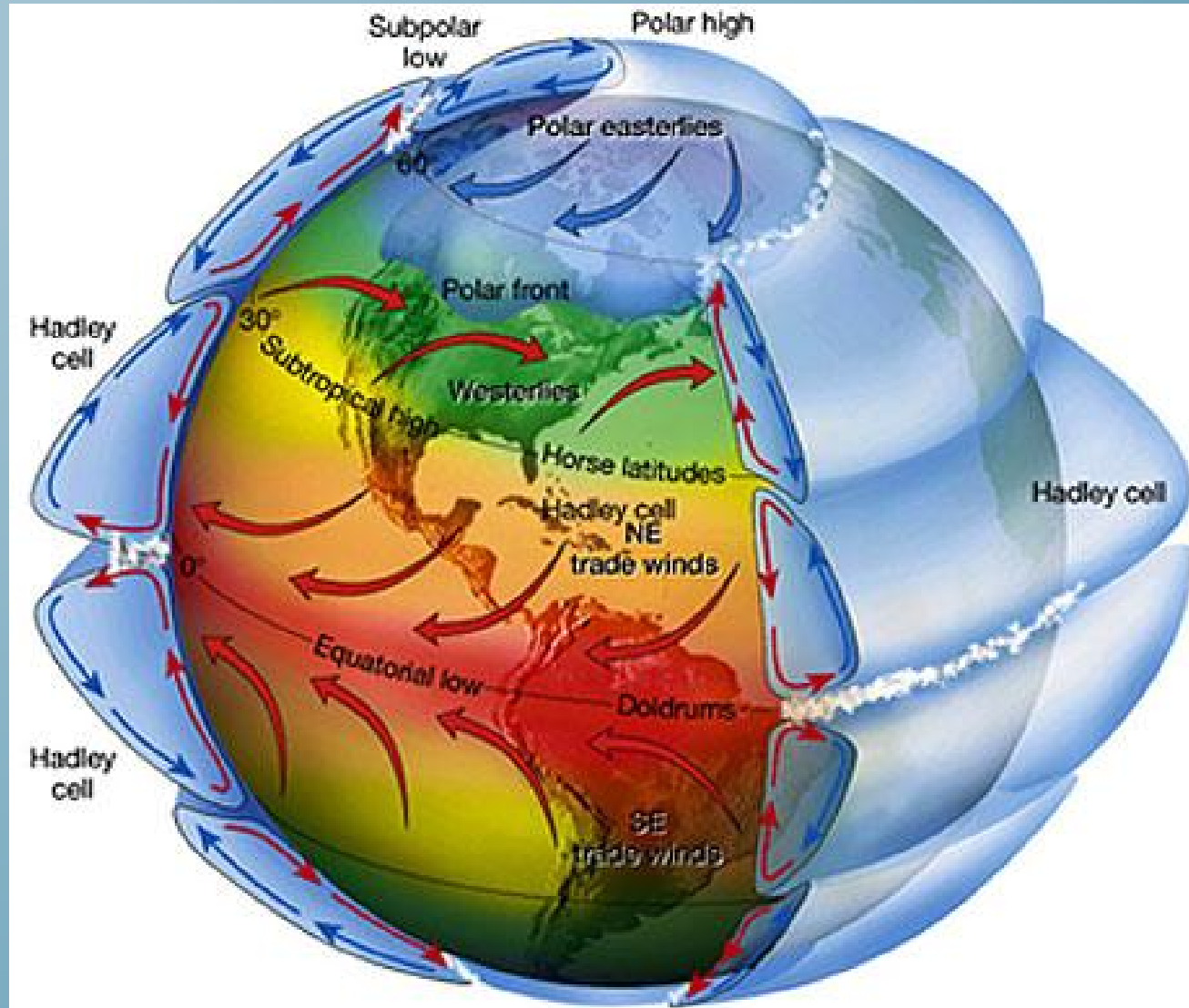


# Global Wind Patterns

- Winds carry heat north from Earth's equator
- Winds carry colder air south toward the equator



# Prevailing Wind Patterns



# BIG IDEA

The Sun's energy produces wind and ocean currents through convection heat transfer

