

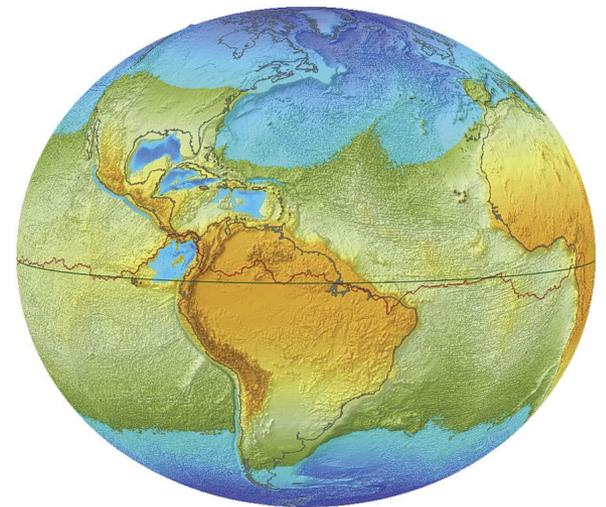
Atmospheric Circulation

Objective: How does uneven heating lead to the ways in which air circulates in our atmosphere?



Some things to remember...

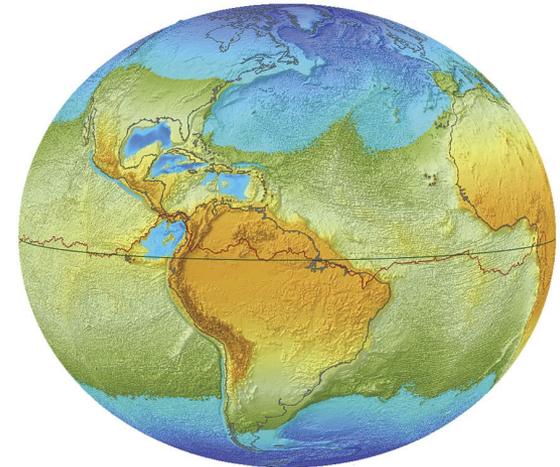
- Earth is not heated evenly
- The equator gets more energy from the sun than the poles. This means that the equator is very hot!
- Earth's poles are very COLD



As you are watching the video....

- Take notes, words or drawings on what you are seeing.
- What are some key vocabulary words you are hearing?
- What are some patterns you see?

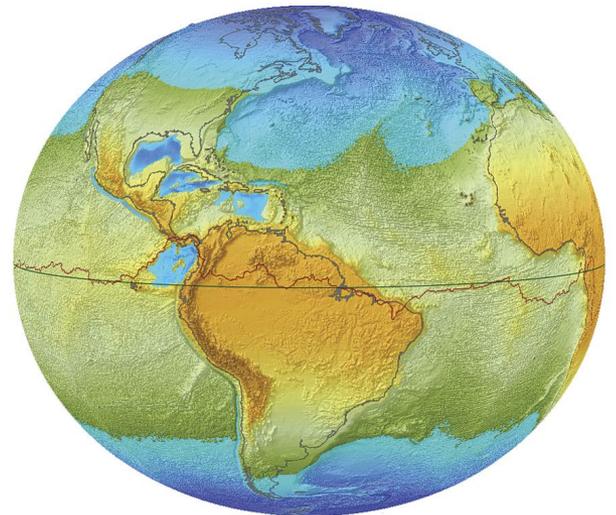
http://www.kevinflint.org/ppt/chap5/Animations/global_circ_anim.h



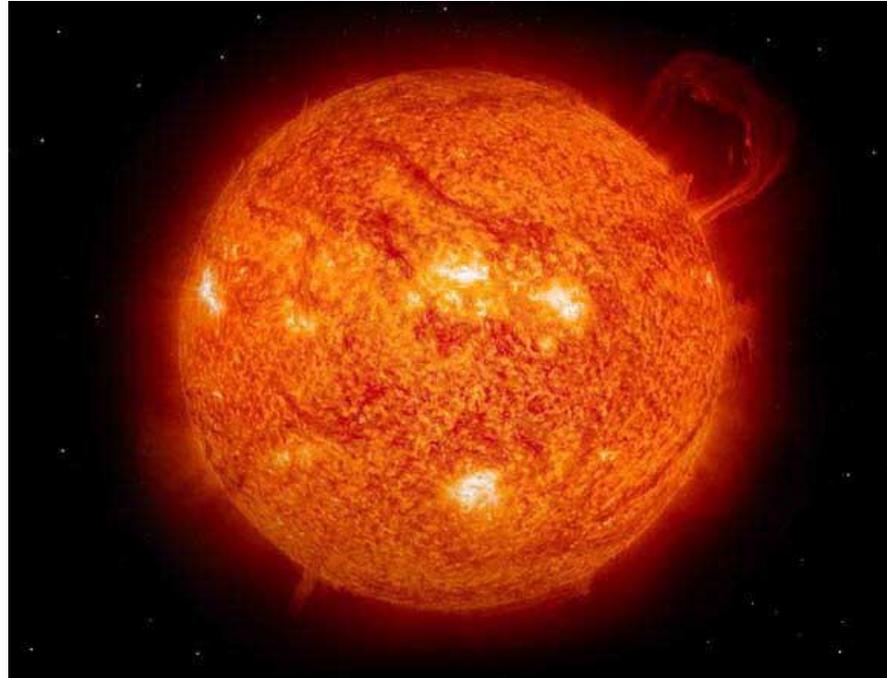
Watch the video again!

After our discussion, see if you can add more notes!

http://www.kevinflint.org/ppt/chap5/Animations/global_circ_anim.html



The sun is where air movement begins.

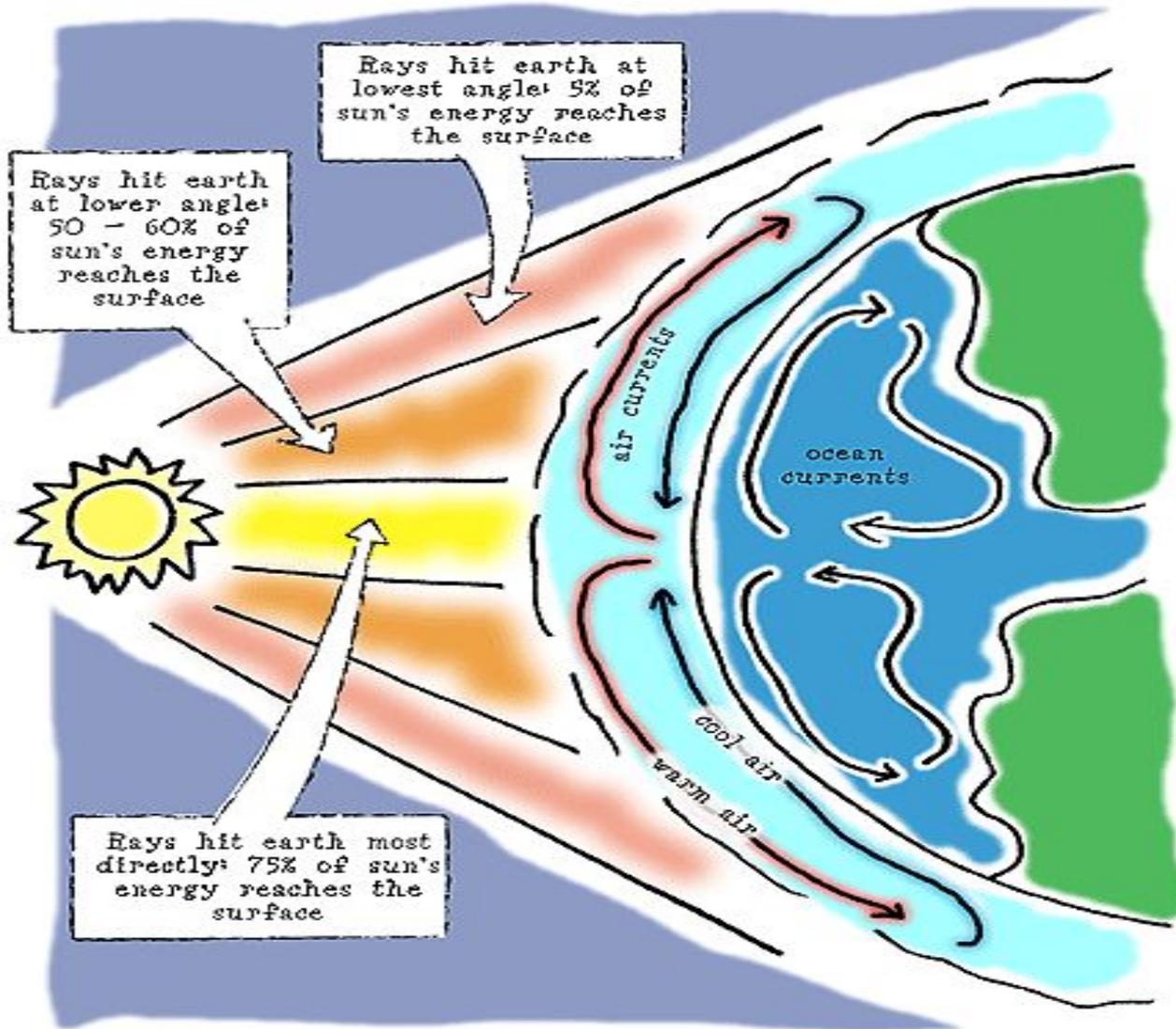


Turn and Talk

Why does movement of air begin with the sun?

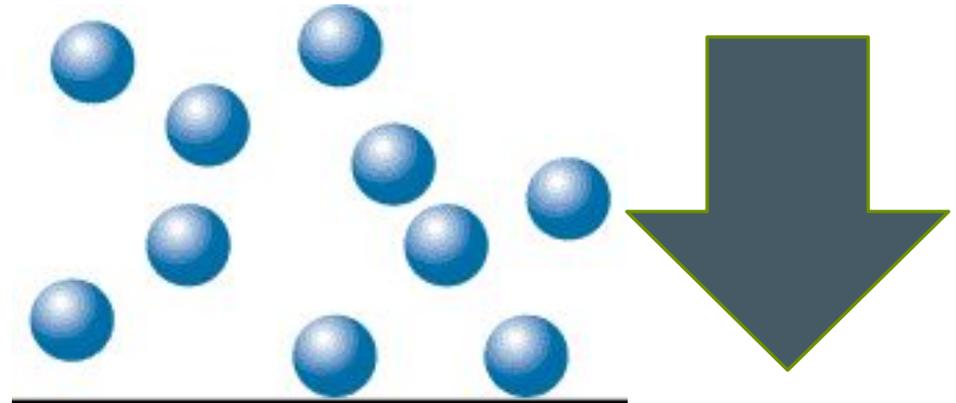
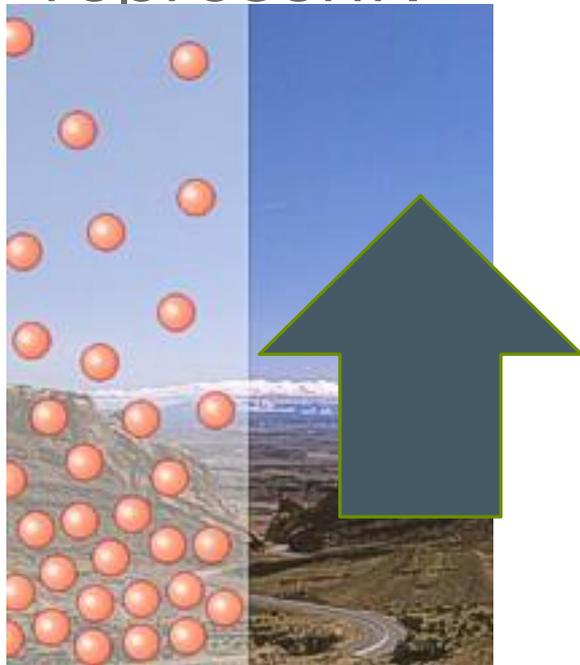
Uneven Heating

Convection and currents:

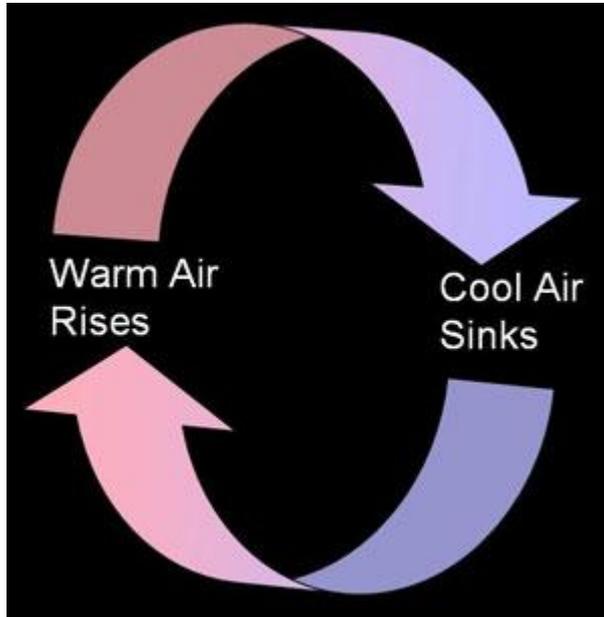


Turn and talk to your partner.

What do you think these pictures represent?



Convection Currents



This movement creates Convection Currents also called convection cells.

Convection cells: The circular pattern of a gas, such as liquid or air, rising and falling because of differences in temperature.

In Air

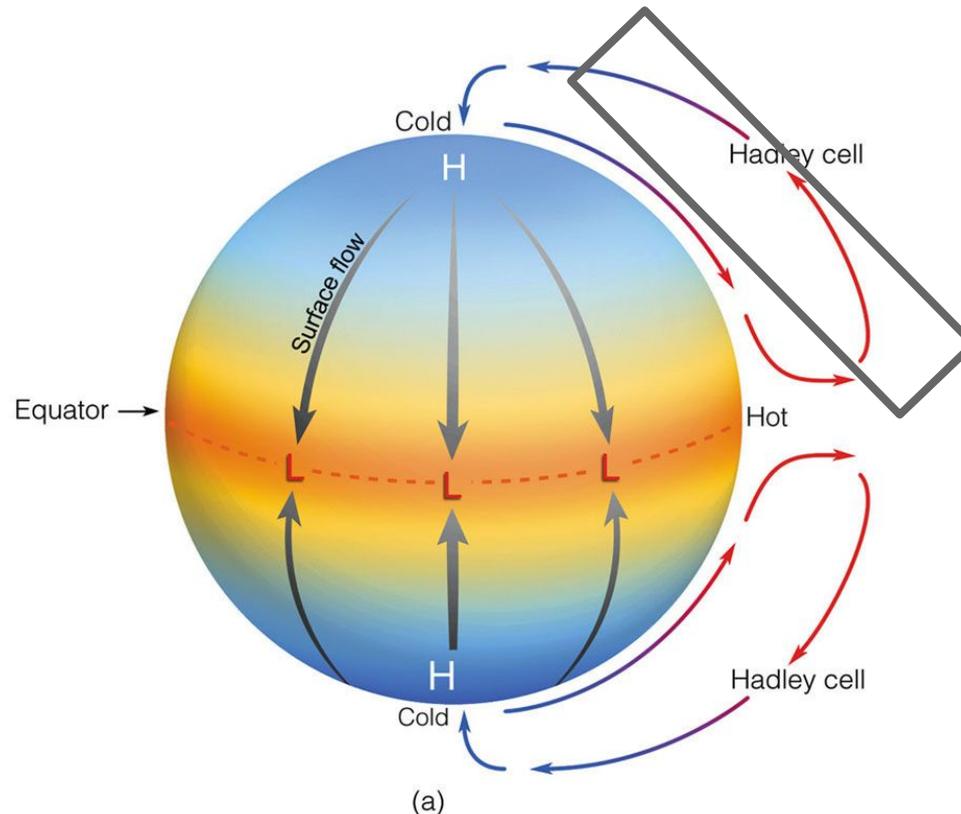


What is this
air
movement
called?

What does this look like over Earth?

If Earth only had an ocean and no land, it would be simple!

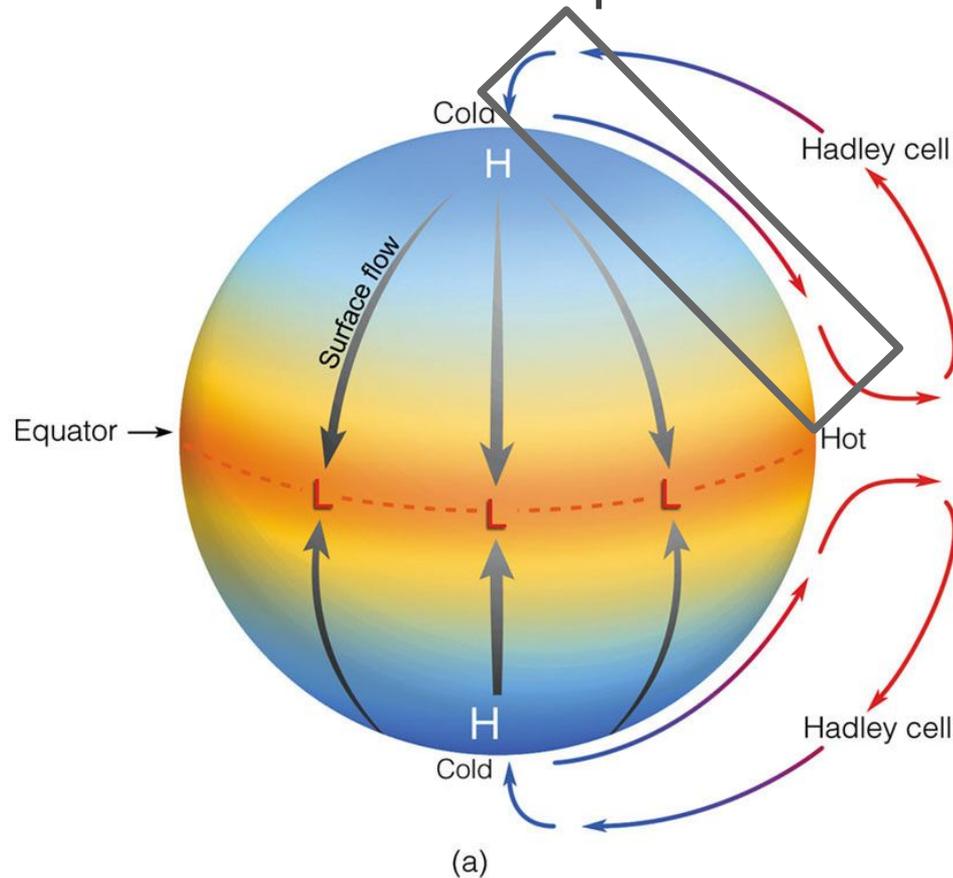
1. Equator receives more solar radiation
2. Hot air rises and flows towards the poles



What does this look like over Earth?

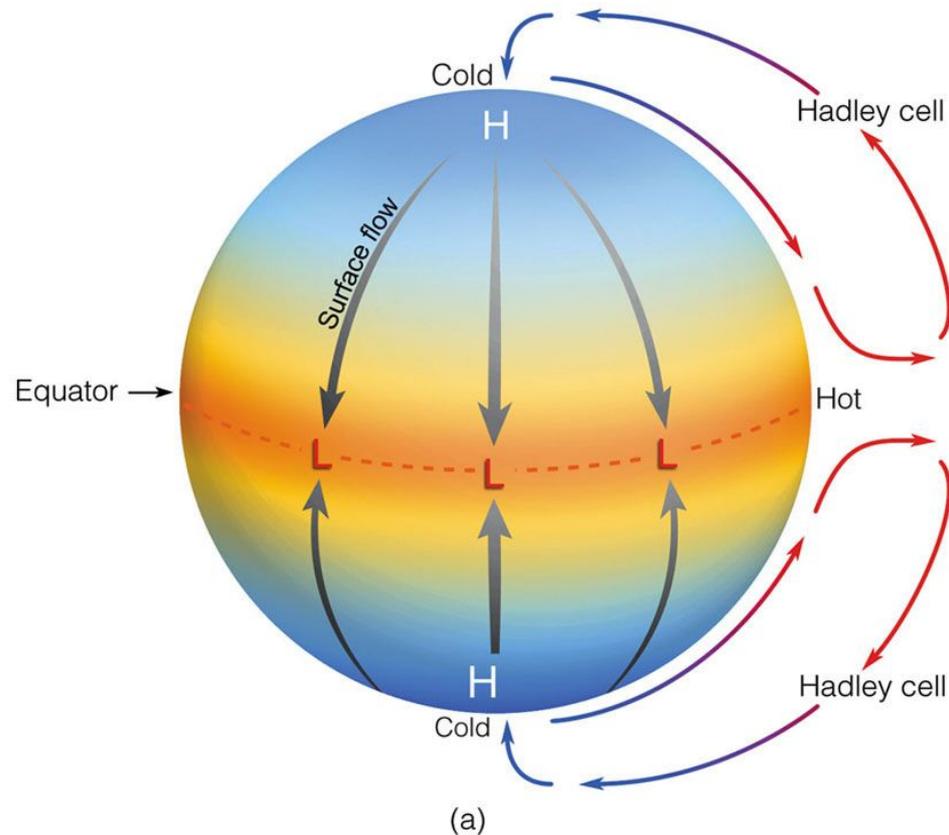
3. Air will cool and sink closer to the poles

4. Cold air then returns to equator at the surface



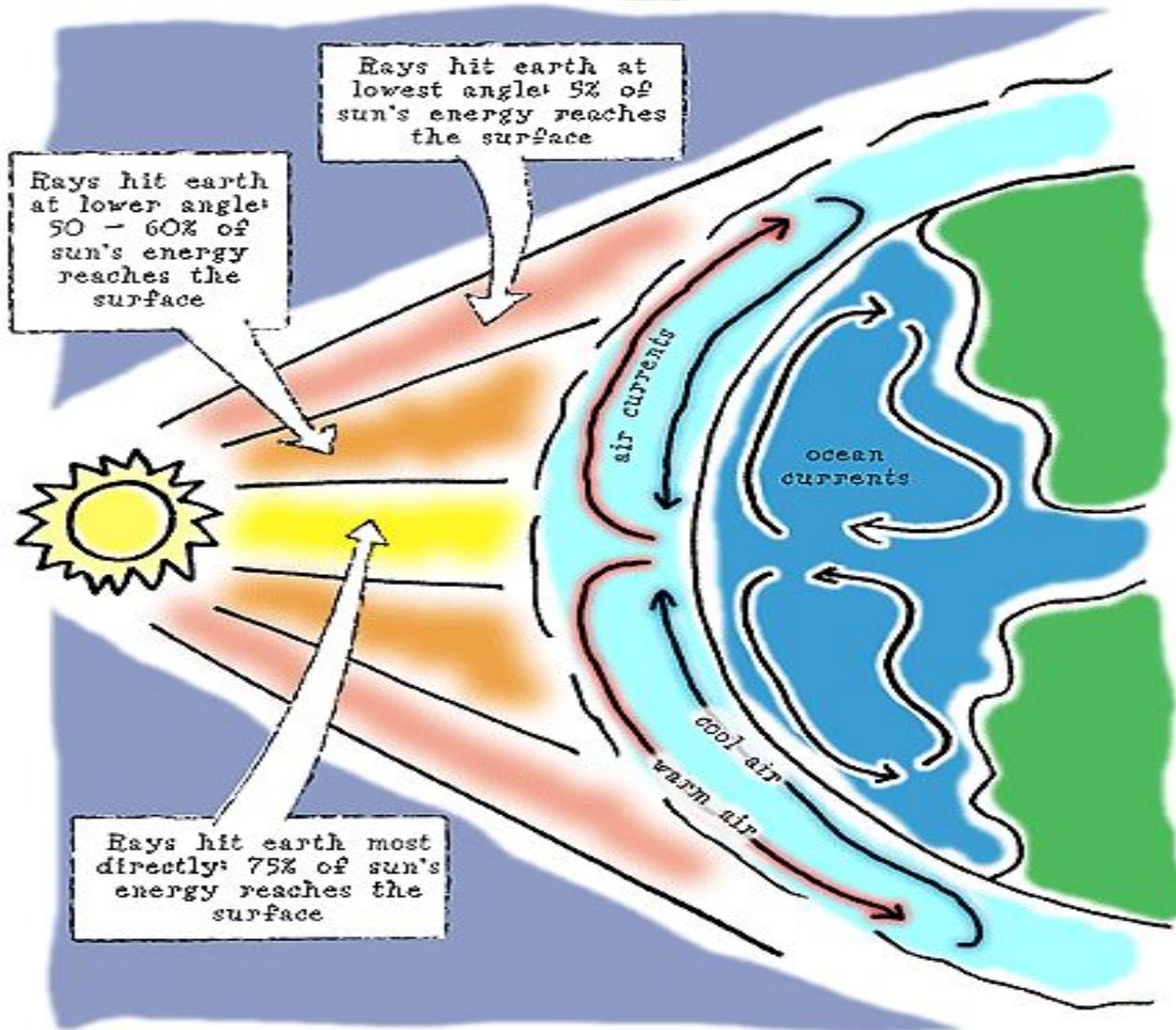
Turn and talk to your partner

What is happening in this picture?



Uneven Heating

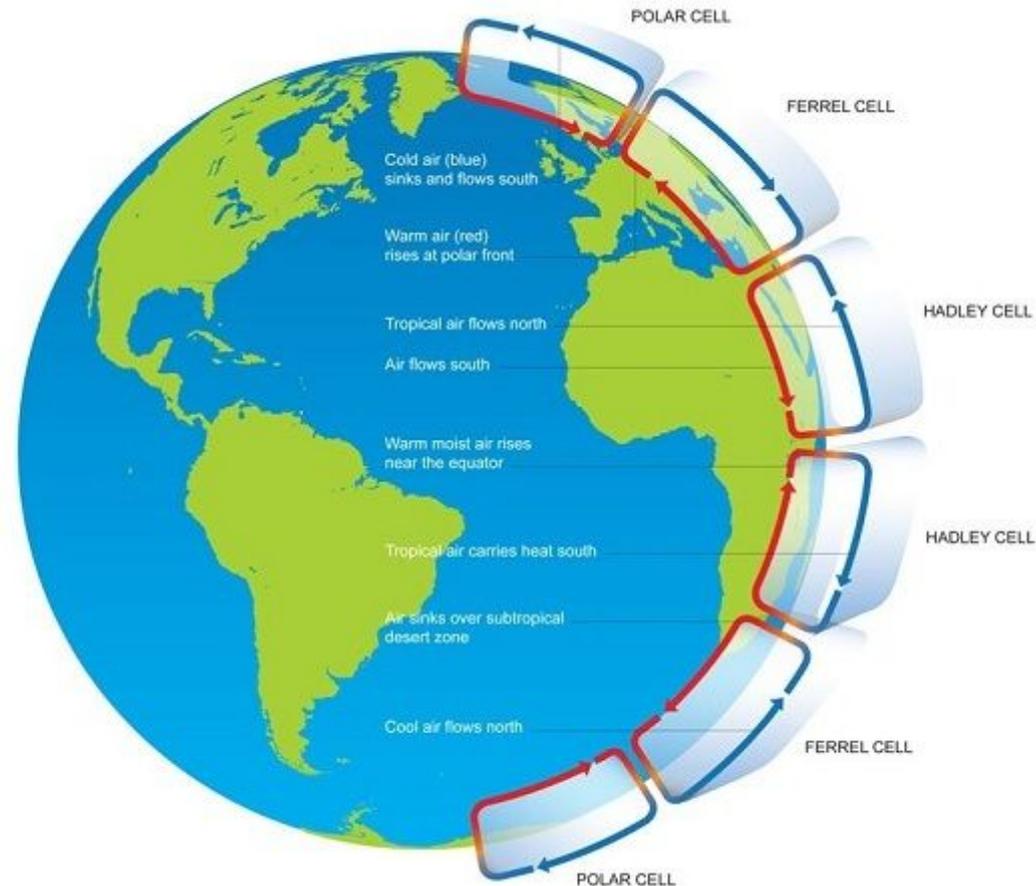
Convection and currents:



Turn and talk to your partner

- Does land and ocean heat the same?
- Do you think this will change our convection current or winds?

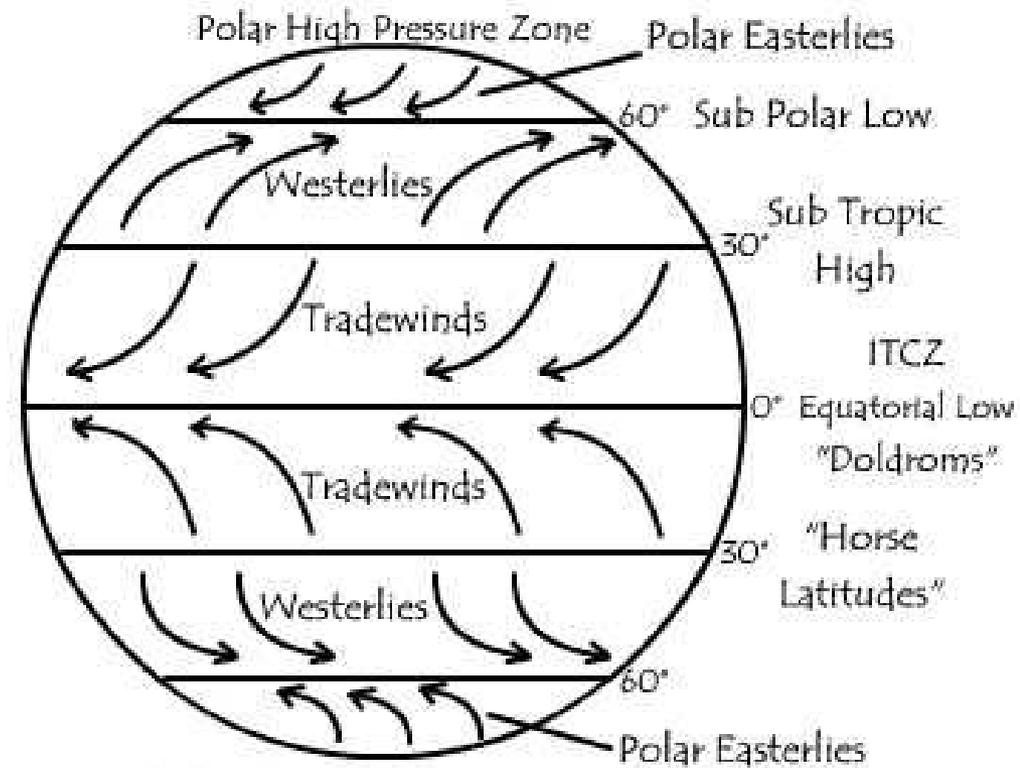
Earth actually has 3 sets of convection cells due to different surfaces and the rotation of the Earth. These convection cells are called the Hadley, Ferrel, and Polar cells .



This circulation makes the winds on our surface!

Because of the convection cells, surface winds are formed!

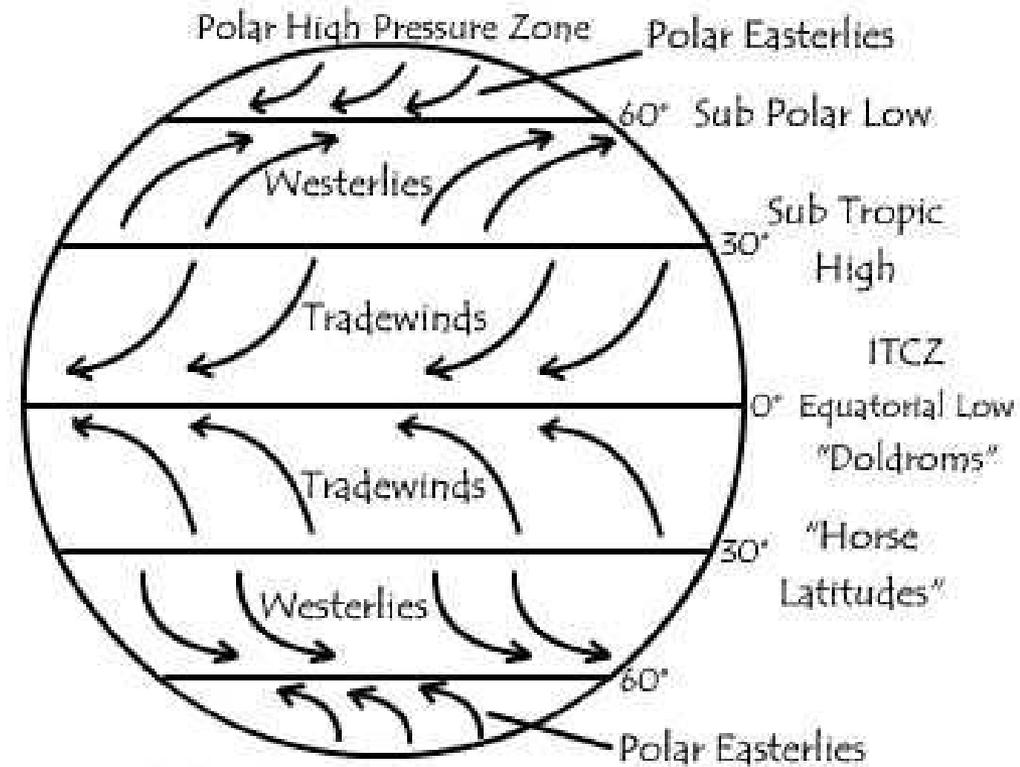
Surface winds:
Winds that occur near the surface due to convection cells.



Note: At high and low pressure zones, most air movement is vertical, not horizontal

Pair Share

What are some observations you can make of these surface winds?



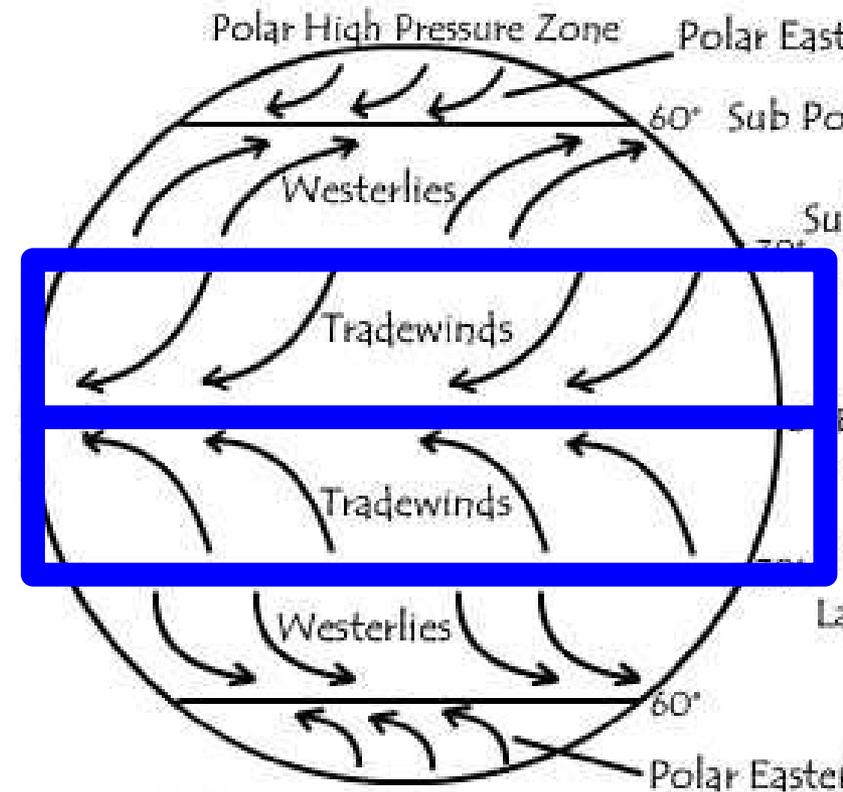
Note: At high and low pressure zones, most air movement is vertical, not horizontal

Current Winds Around Earth

<http://earth.nullschool.net/#current/wind/surface/level/orthographic=102.47,-57.82,305>

- □ Occurs between 0 - 30 degrees
- Flow towards the equator moving from east to west
- The name tradewinds comes from sail ships on trade routes.
- At the equator, the wind dies down!

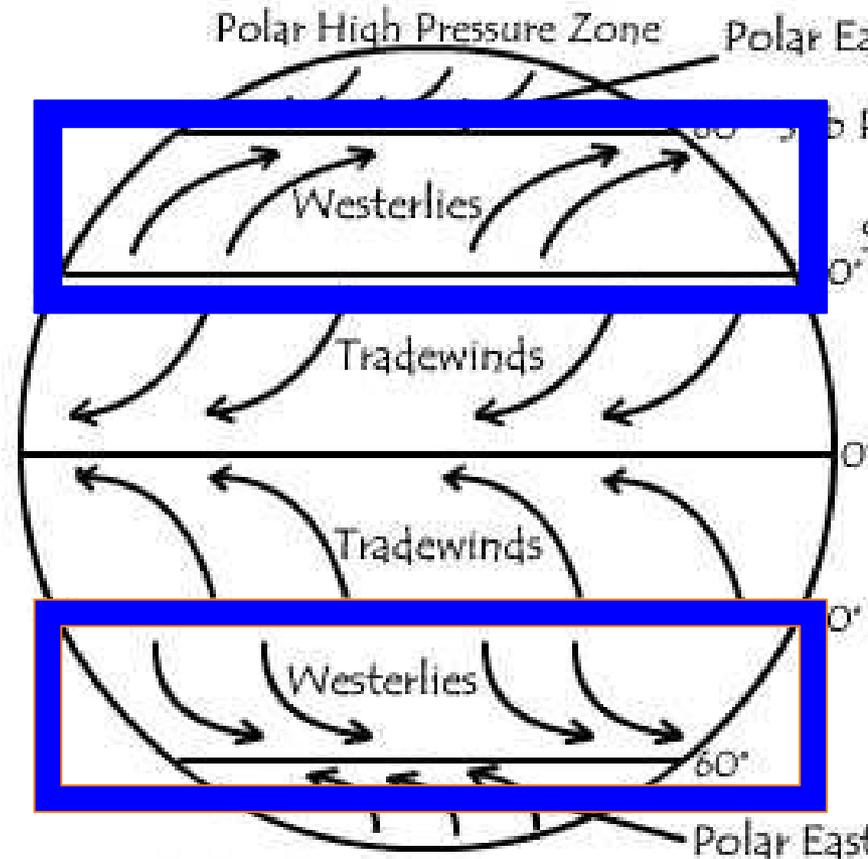
Tradewinds



Note: At high and low pressure zones, most air movement is vertical, not horizontal

- Between 30° and 60° latitude, you will find the westerlies
- In the Northern Hemisphere, the westerlies move from west to east
- California experiences westerlie winds. That's why weather moves west to east in the US.

Westerlies



Note: At high and low pressure zones, most air movement is vertical, not horizontal

Polar Easterlies

- Between 60 - 90 degrees
- Moves away from the poles from east to west
- The polar easterlies are strongest where they flow off Antarctica.
 - Did this match our current winds?

