

Handout 3 3-1 (green)

Properties of the Atmosphere

Atmospheric Circulation

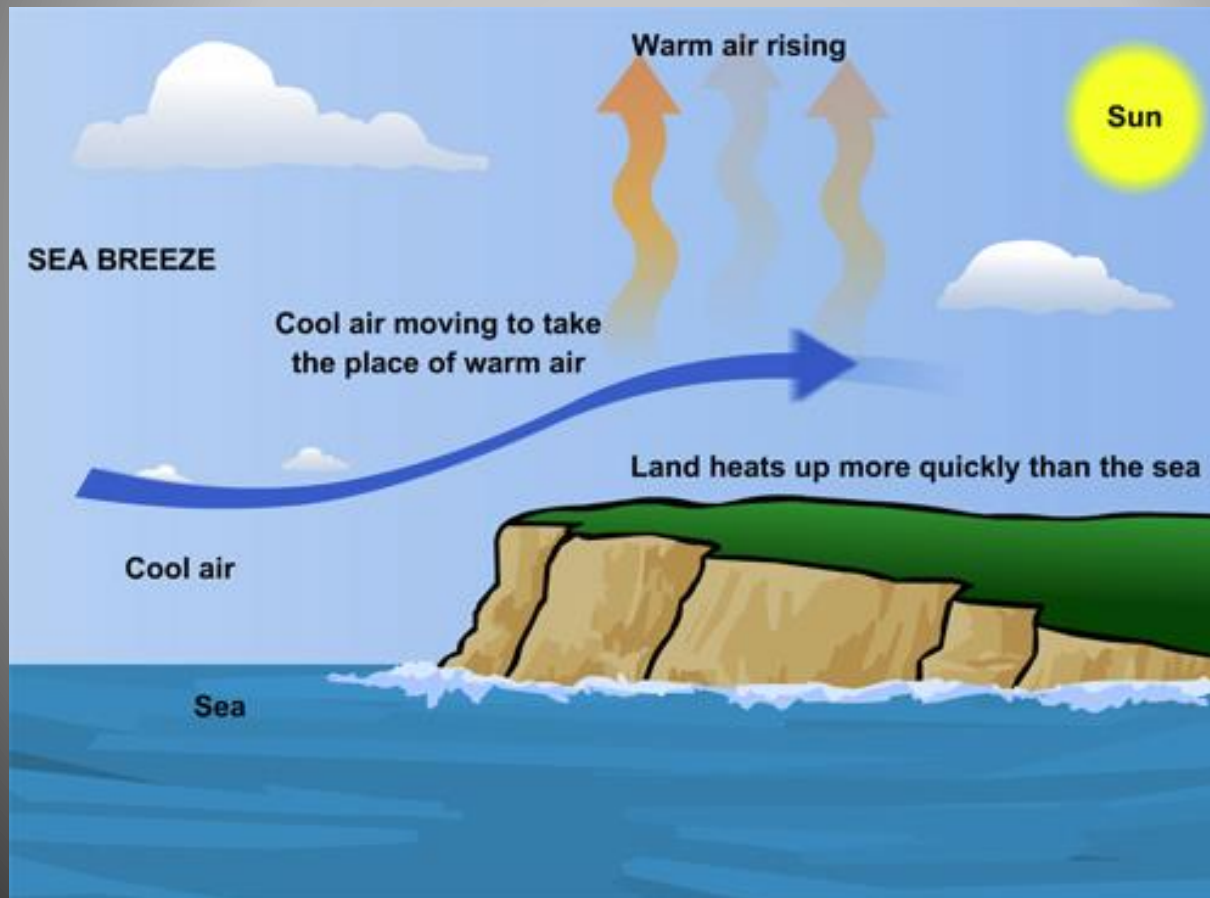
Standard 3 Objective 1 Indicator d

Standard 3 Objectives 1, 2, and 3

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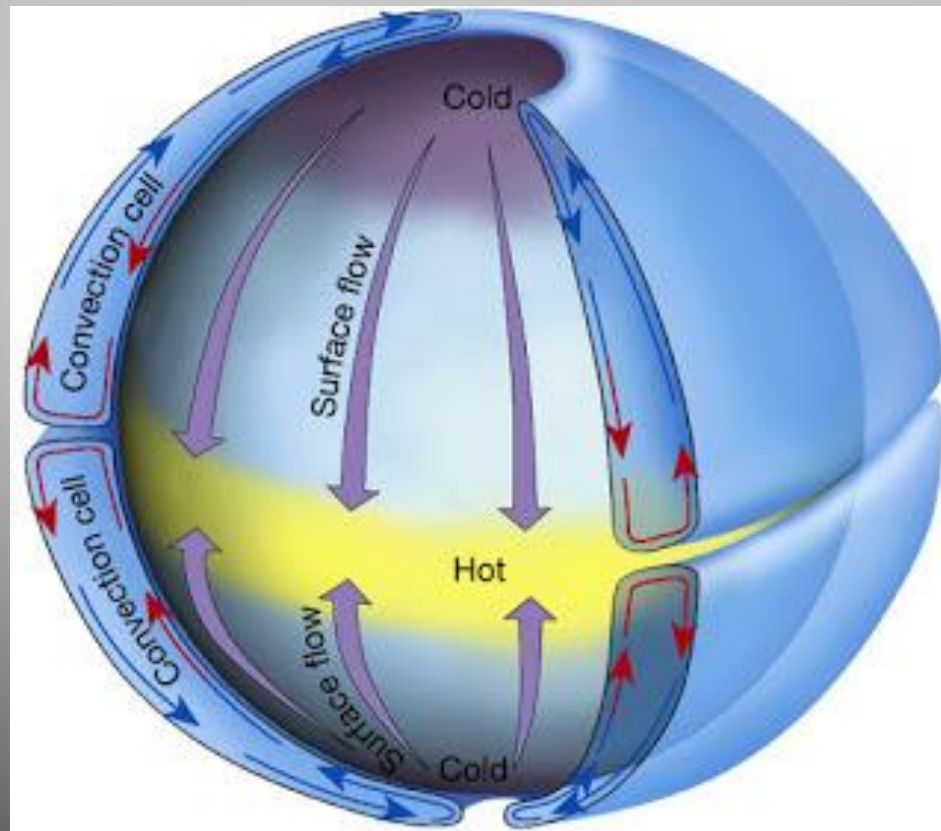
1. What causes the movement of air worldwide?

- Pressure differences in the atmosphere



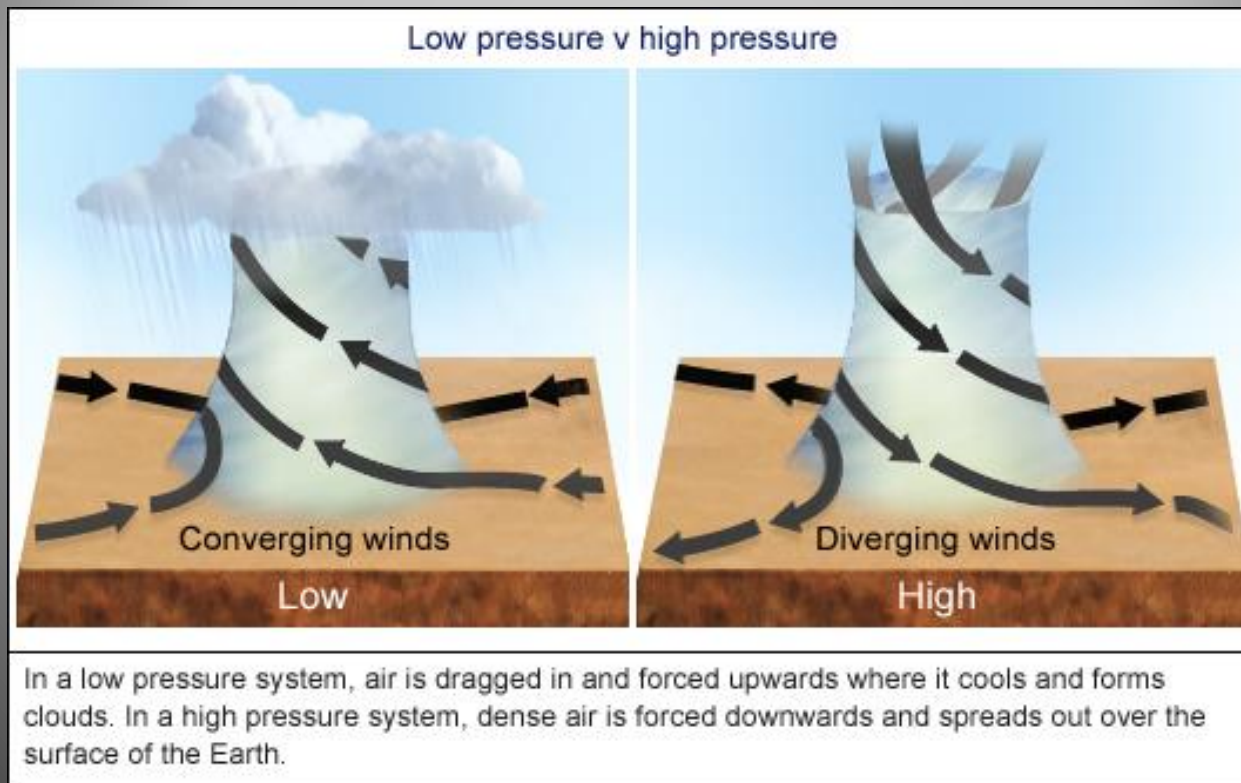
2. Why does air near Earth's surface flow from the poles to the equator?

- Air moves from high-pressure to regions to lower-pressure regions



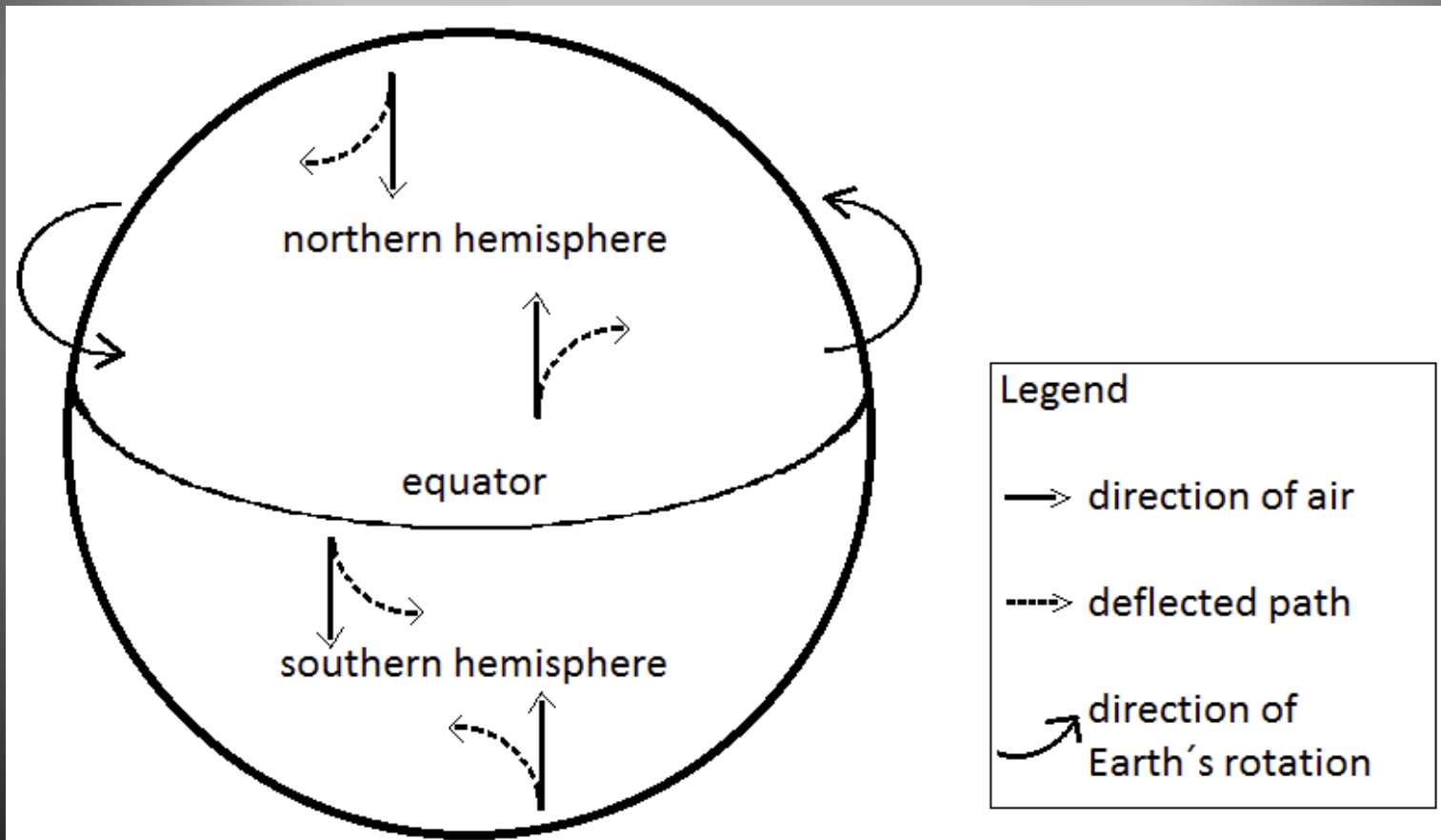
3. Where do low-pressure regions form?

- Where warm air rises away from Earth's surface



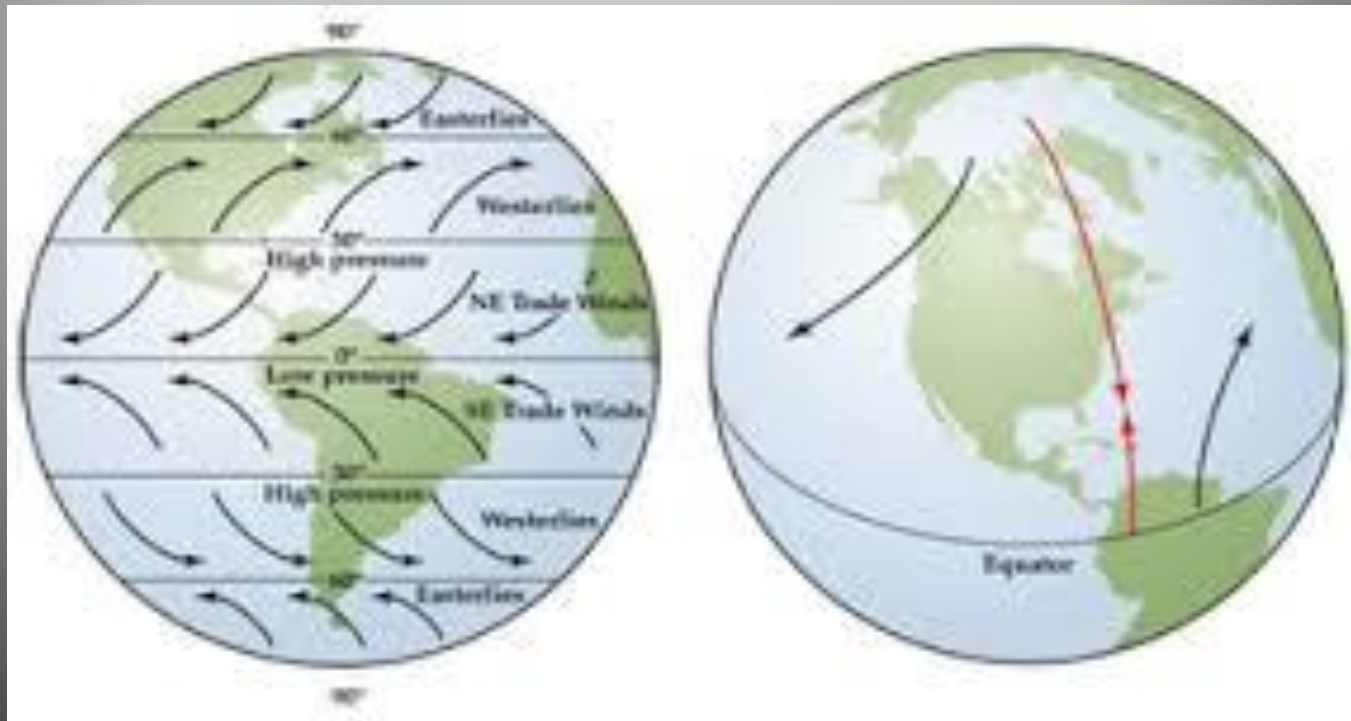
4. What is the circulation of the atmosphere and of the oceans affected by?

- The rotation of Earth on its axis

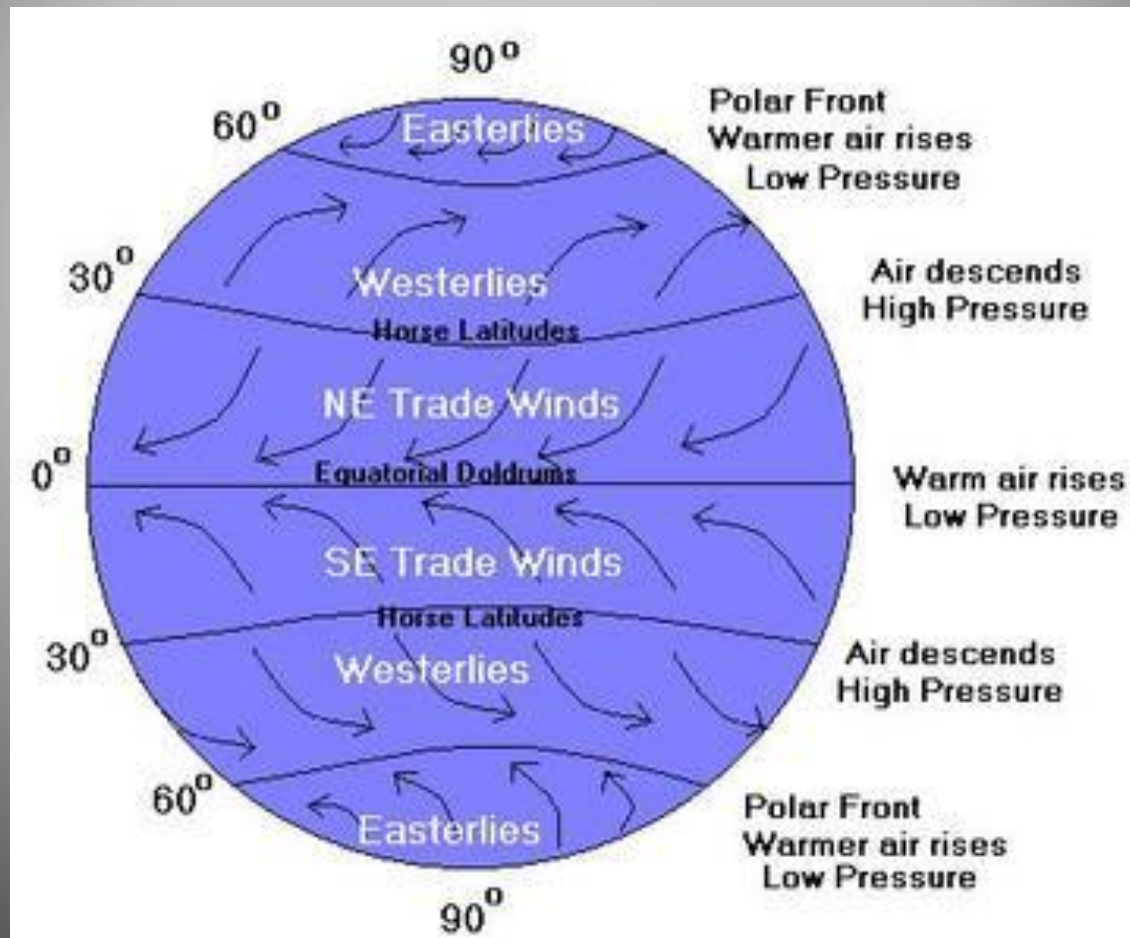


5. Why does air follow a curved path?

- When air moves toward the poles it travels East faster than the land beneath it. As a result, the air follows a curved path

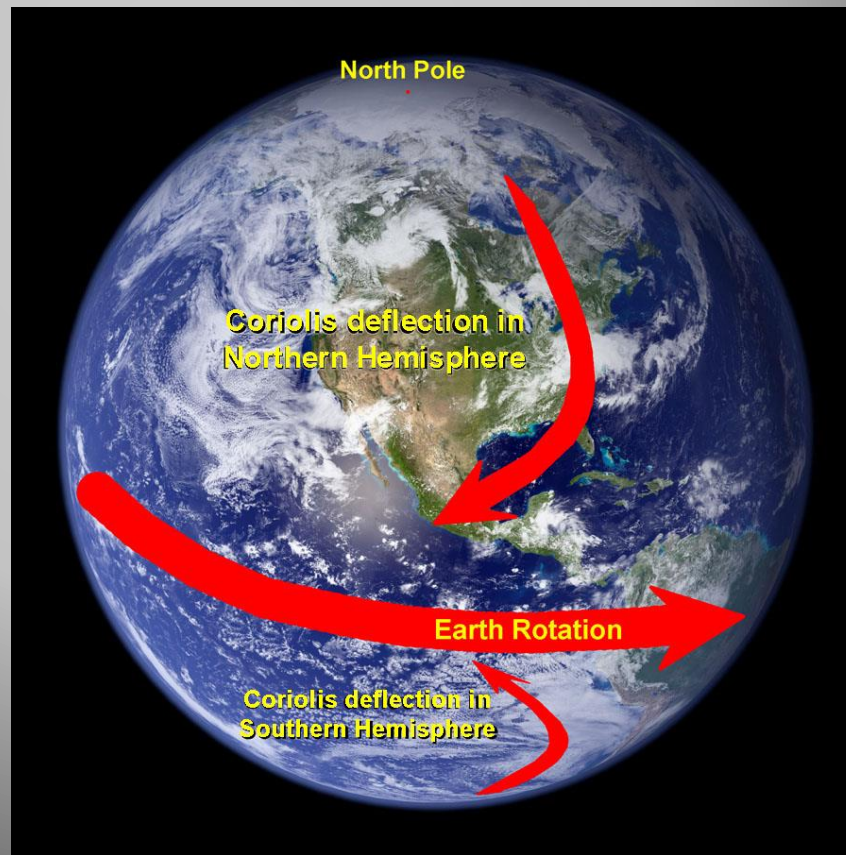


6. The curving of the path of a moving object from an otherwise straight path due to earth's rotation is called the Coriolis effect.



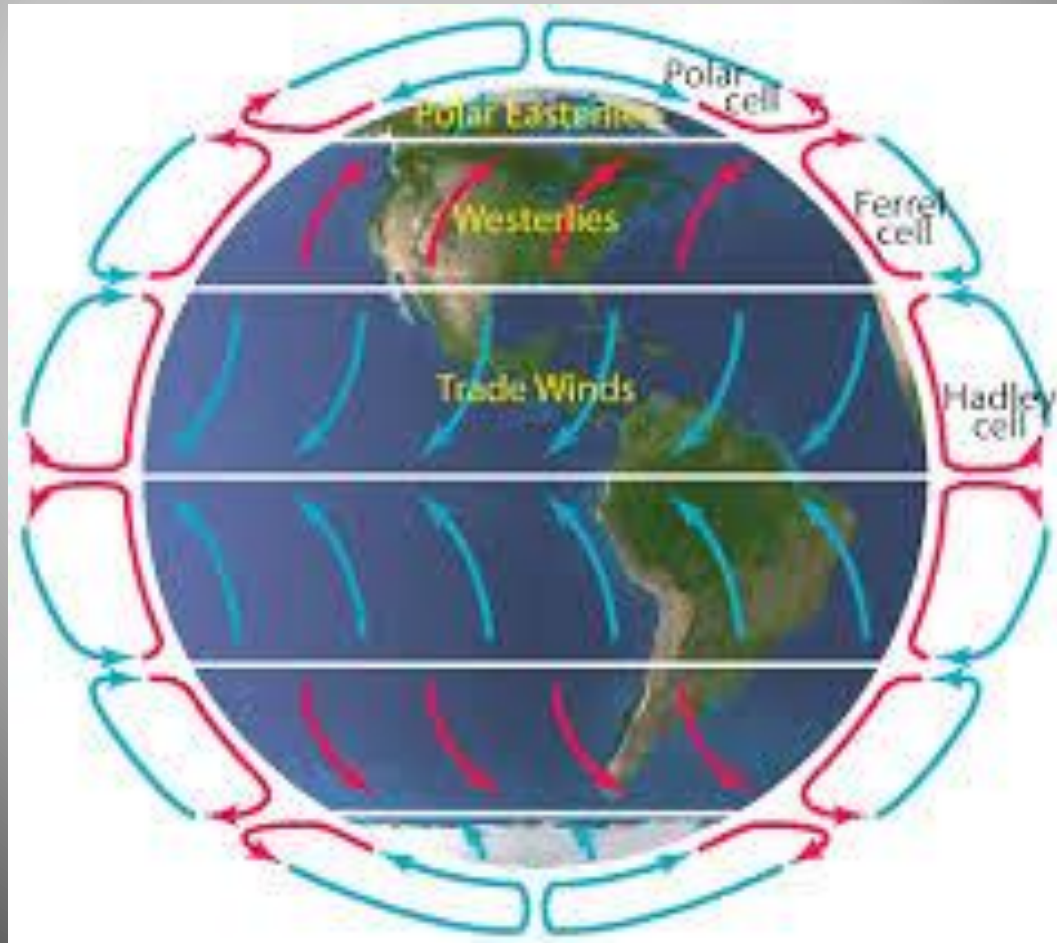
7. In which direction does the Coriolis effect deflect moving objects in the Northern Hemisphere? And in the Southern Hemisphere?

- Objects are deflected to the right in the Northern Hemisphere and to the left in the Southern Hemisphere.

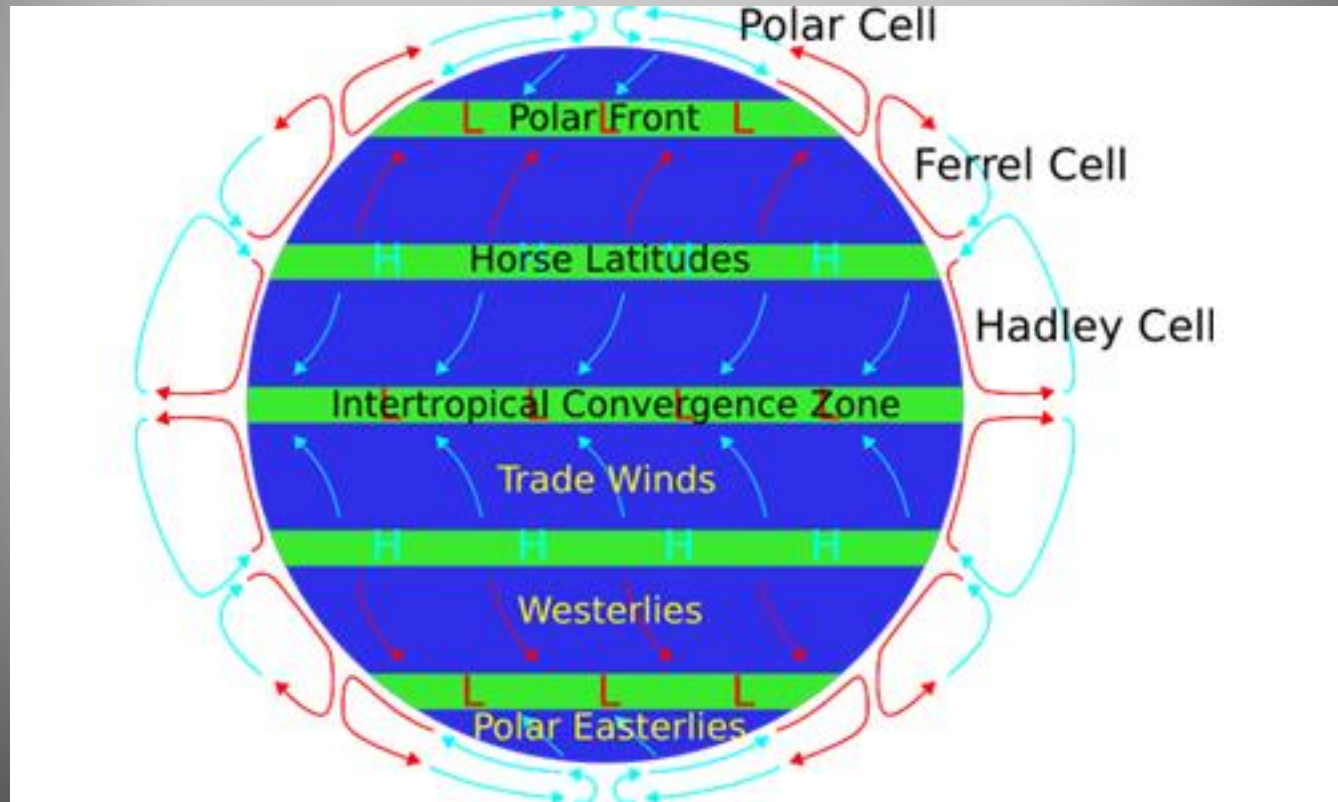


8. What are the three looping patterns of air flow in each hemisphere called?

- Convection cells

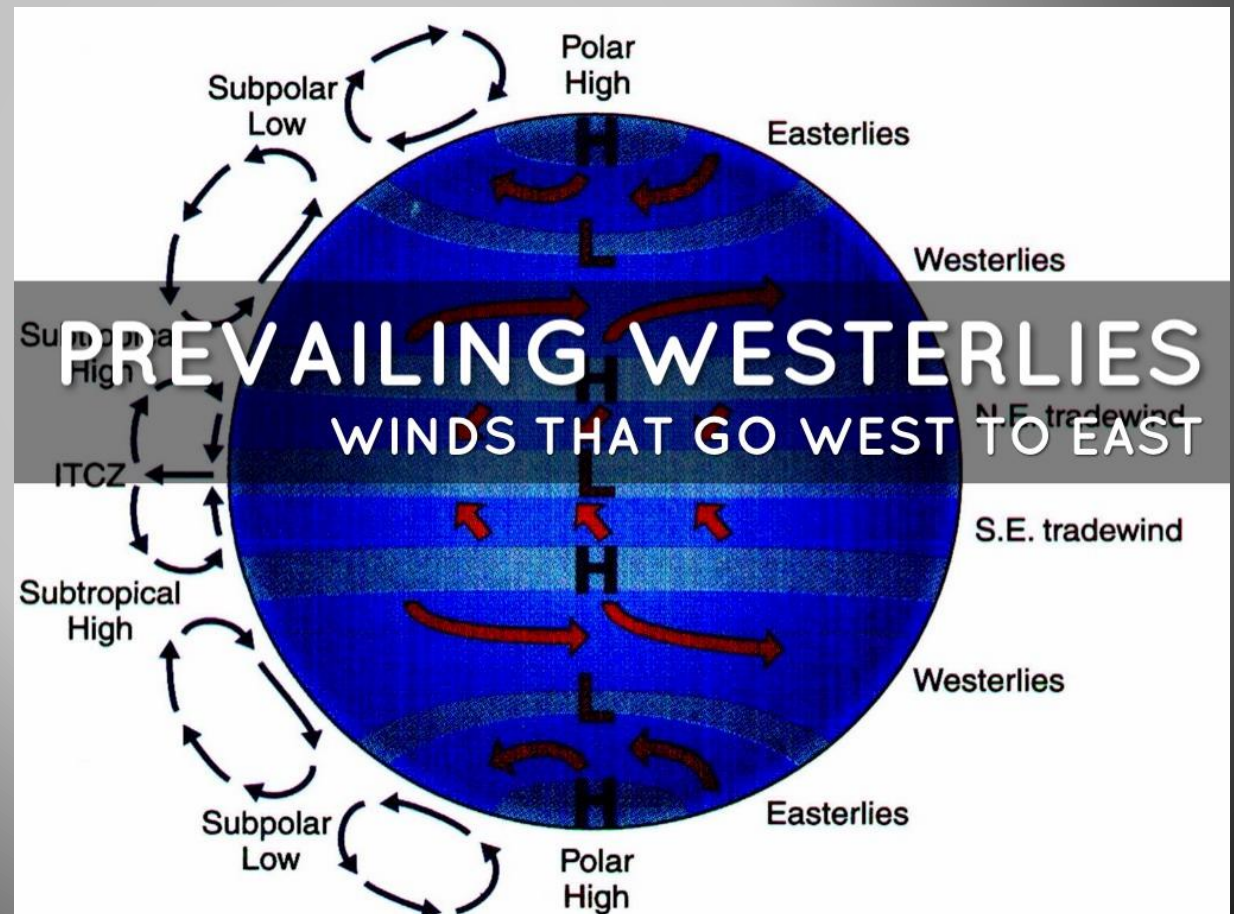


9. The prevailing winds that blow from east to west from 30° latitude to the equator in both hemispheres are called the Trade winds .



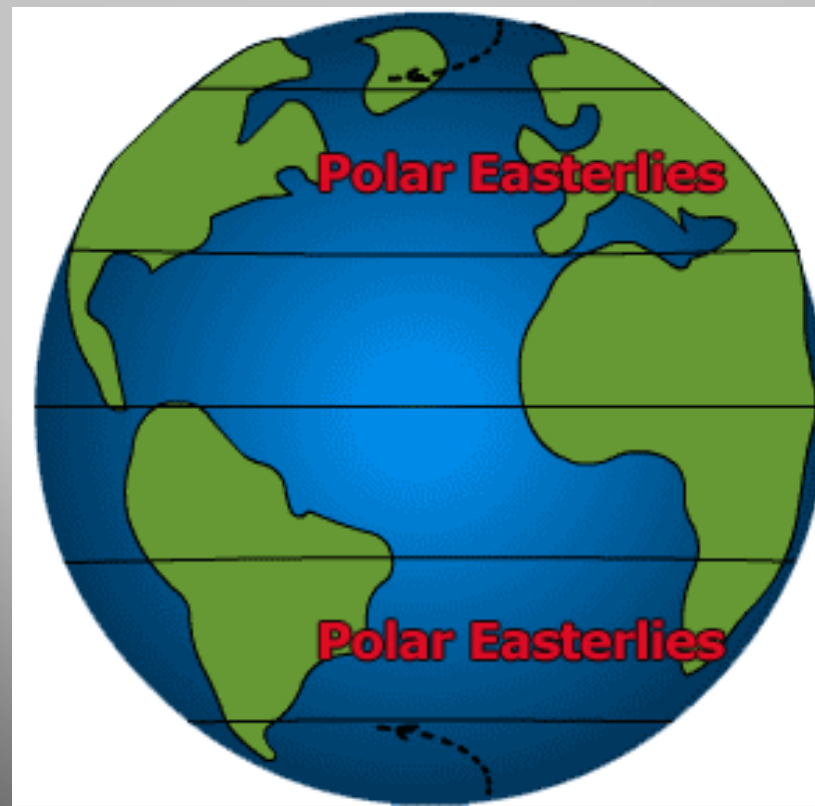
10. What are the prevailing winds that blow from west to east through the United States called?

- Westerlies



11. What are the prevailing winds that blow from east to west between 60° and 90° in both hemispheres?

- The Polar Easterlies



Matching 12-15

12. doldrums

13. horse latitudes

14. jet streams

15. subtropical jet streams

a. narrow bands of winds formed when warm equatorial air meets the cooler air of the middle latitudes

b. narrow bands of strong winds that blow in the upper troposphere

c. a zone of low pressure at the equator where the trade wind systems meet

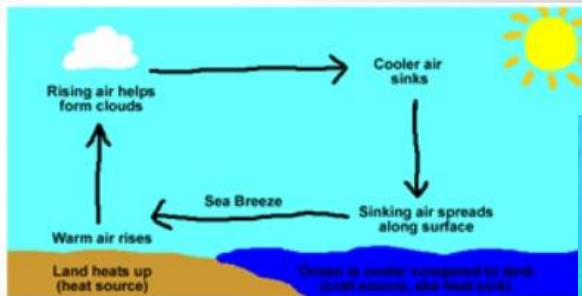
d. subtropical high-pressure zones with weak and variable winds

16. Air movement influenced by local conditions and local temperature variations often cause Local winds, which are not part of the global wind belts.

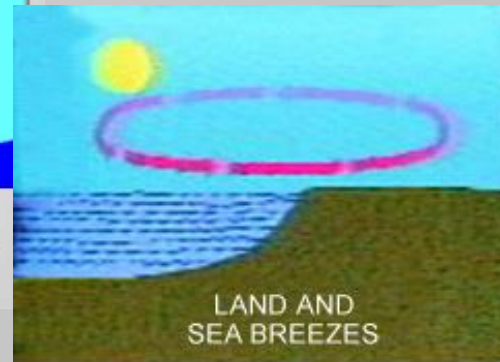
Local Wind Diagram

Use our new rhyme to see which way the wind blows:

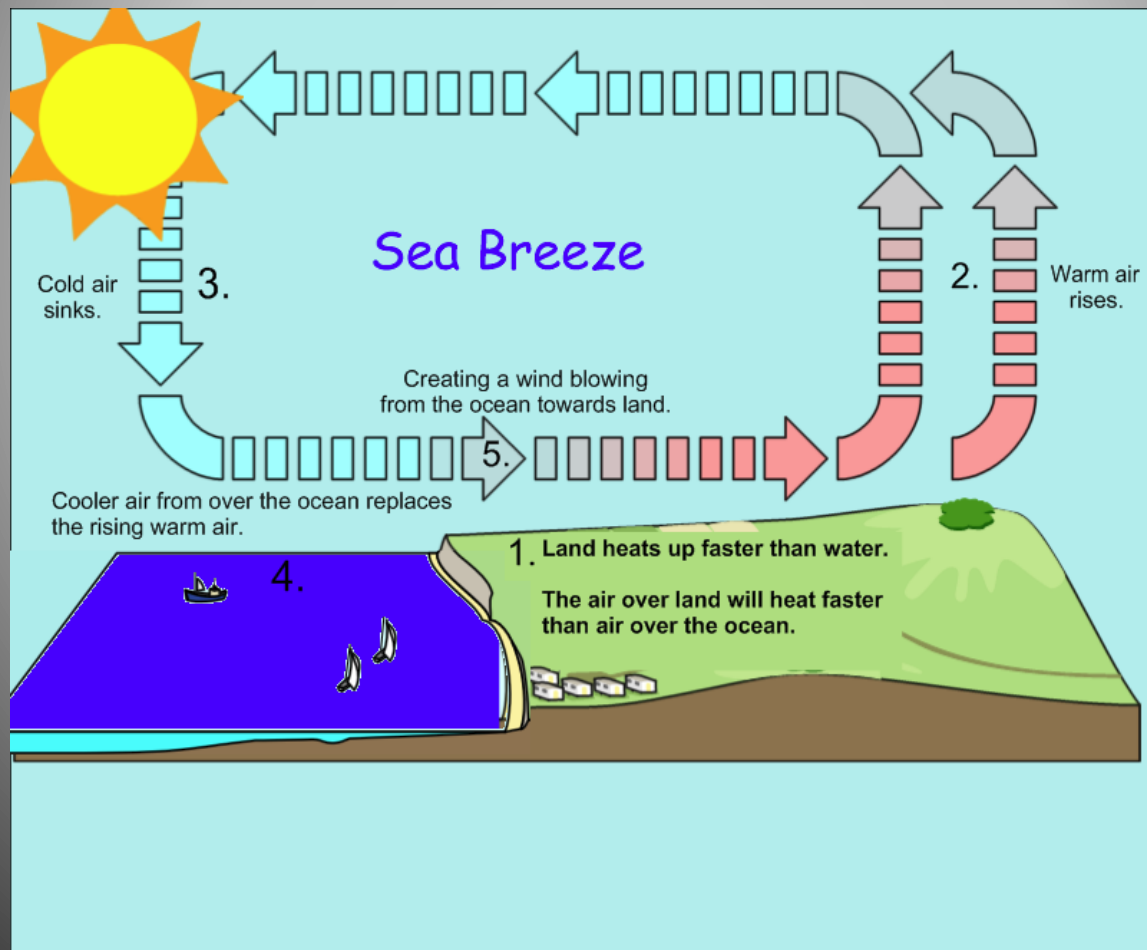
The wind will blow from high to low; the air pressure will make them blow.



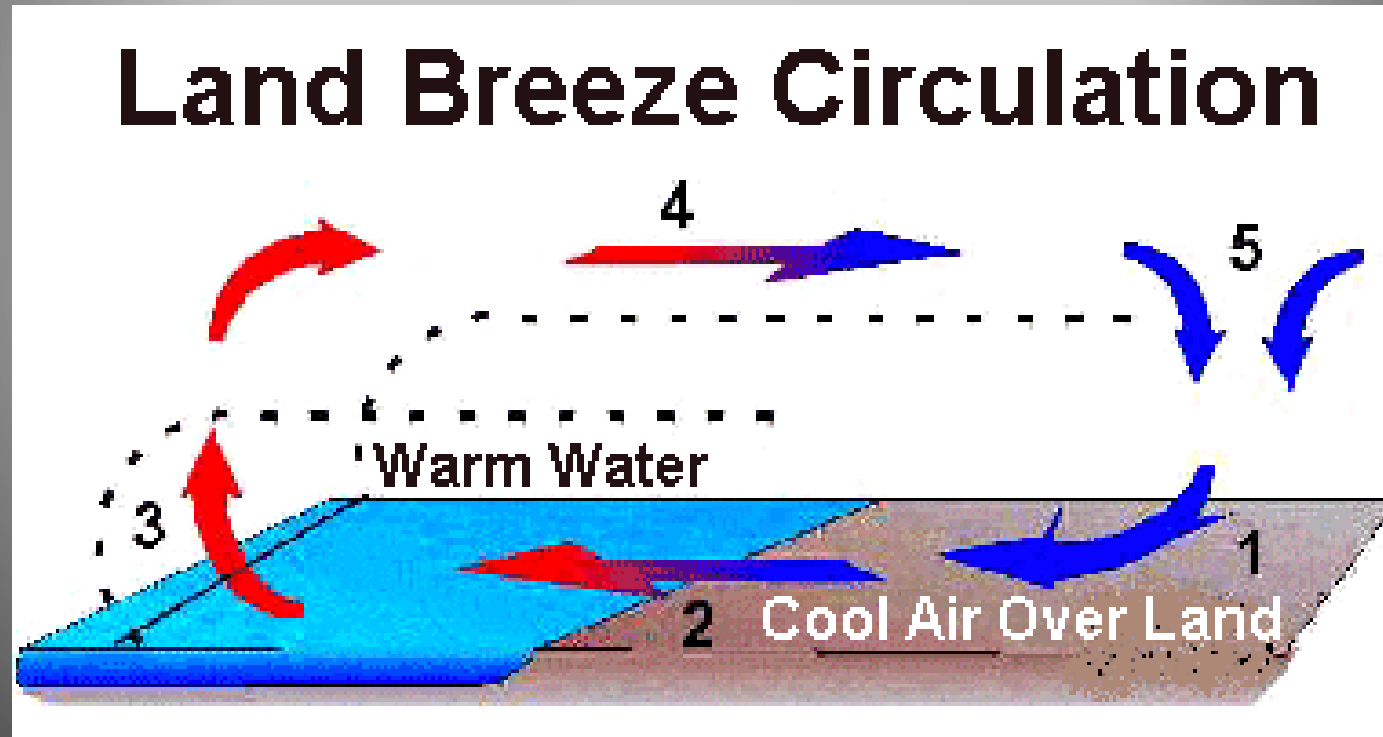
Land heats up (absorbs energy) faster than the ocean. Warm air is less dense and rises to create low air pressure. The cooler, high pressure air blows in from the ocean. We call this a **SEA BREEZE!**



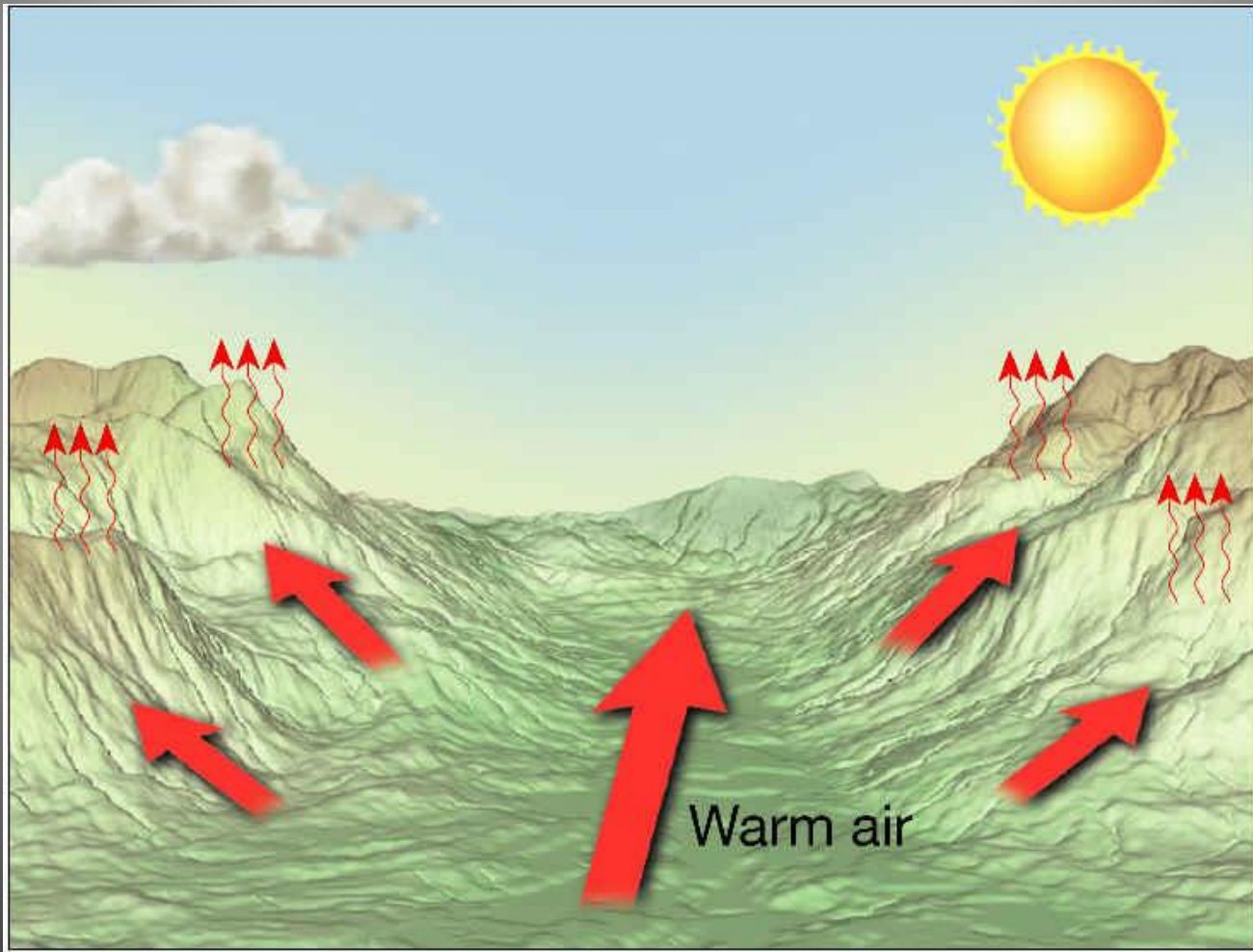
17. As warm air above land rises and cool air from above water moves in to replace it, a cool wind moving from water to land, called a Sea breeze, forms in the afternoon.



18. At night, as warm air above water rises and cool air from above land moves out to replace it, a cool wind moving from land to water, called a Land breeze forms.



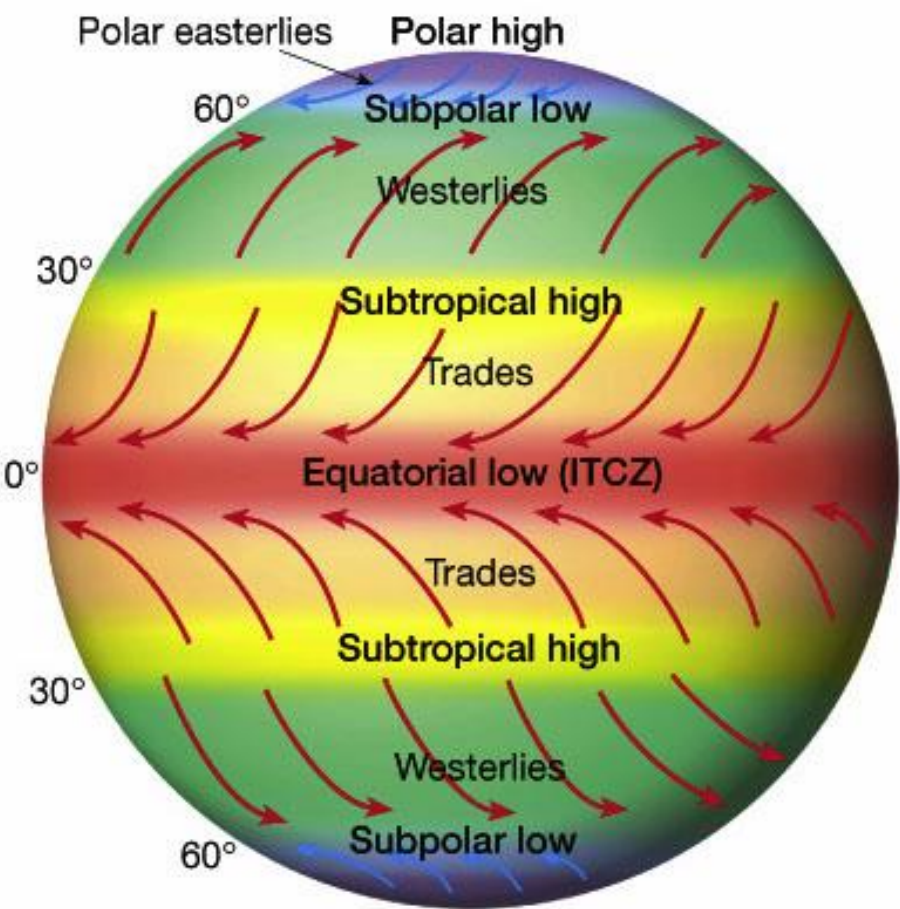
19. During the day in mountainous regions, a gentle breeze called a Valley breeze forms when warm air from the valleys moves.



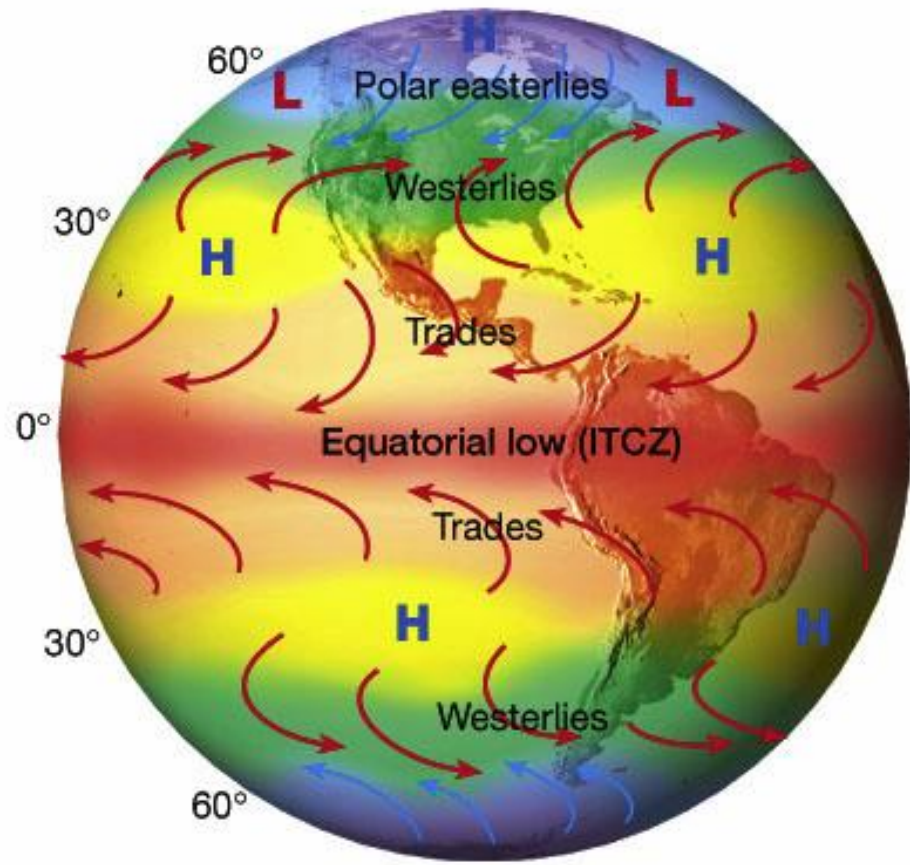
20. Explain how the Coriolis Effect affects wind flow.

- The Coriolis effect causes wind to curve because wind is blowing at a different speed than the ground beneath it.
- Northern Hemisphere = Winds curve to the right
- Southern Hemisphere = Winds curve to the left

Coriolis Effect



(a)

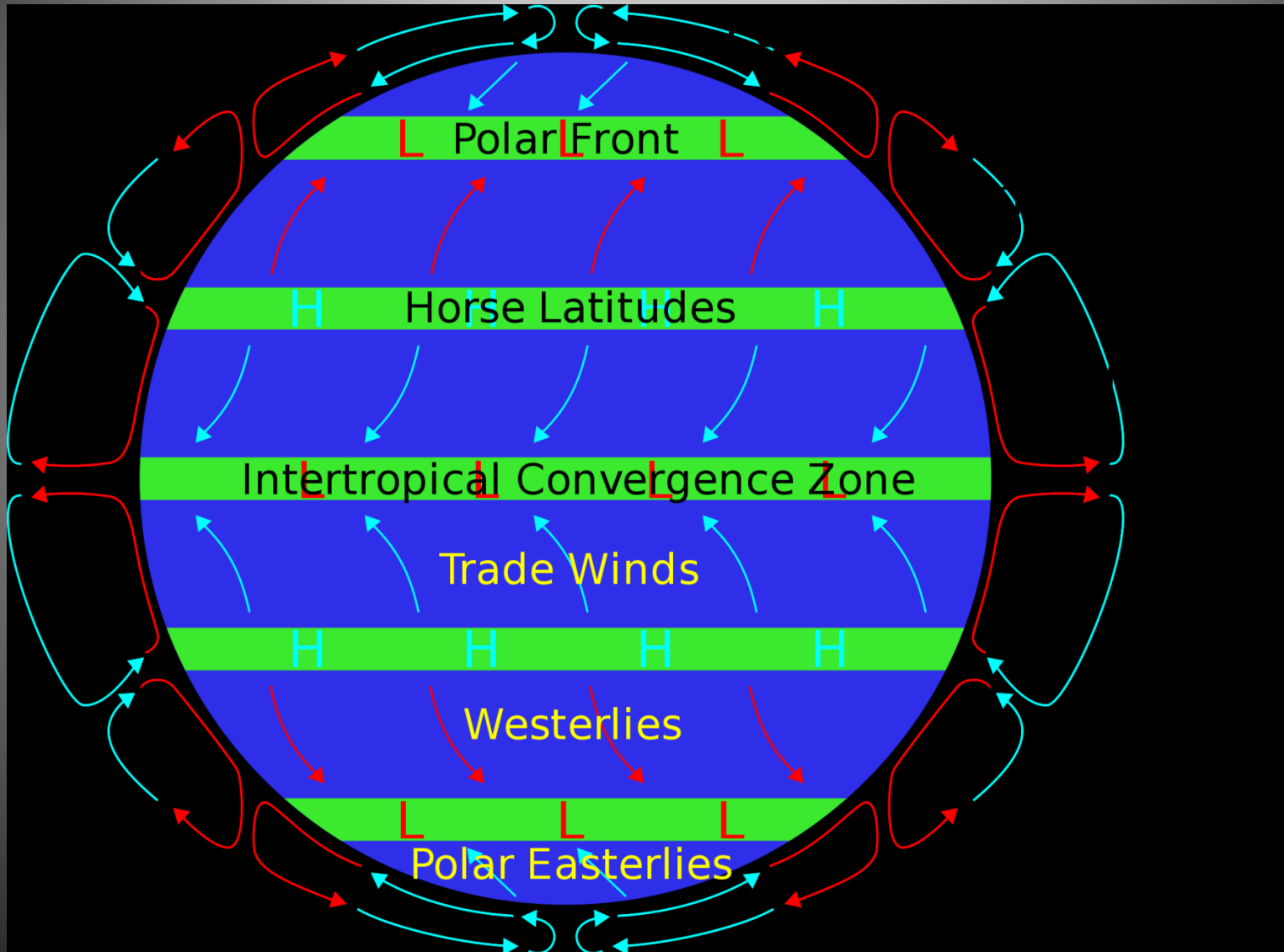


(b)

21. Name and describe Earth's three global wind belts.

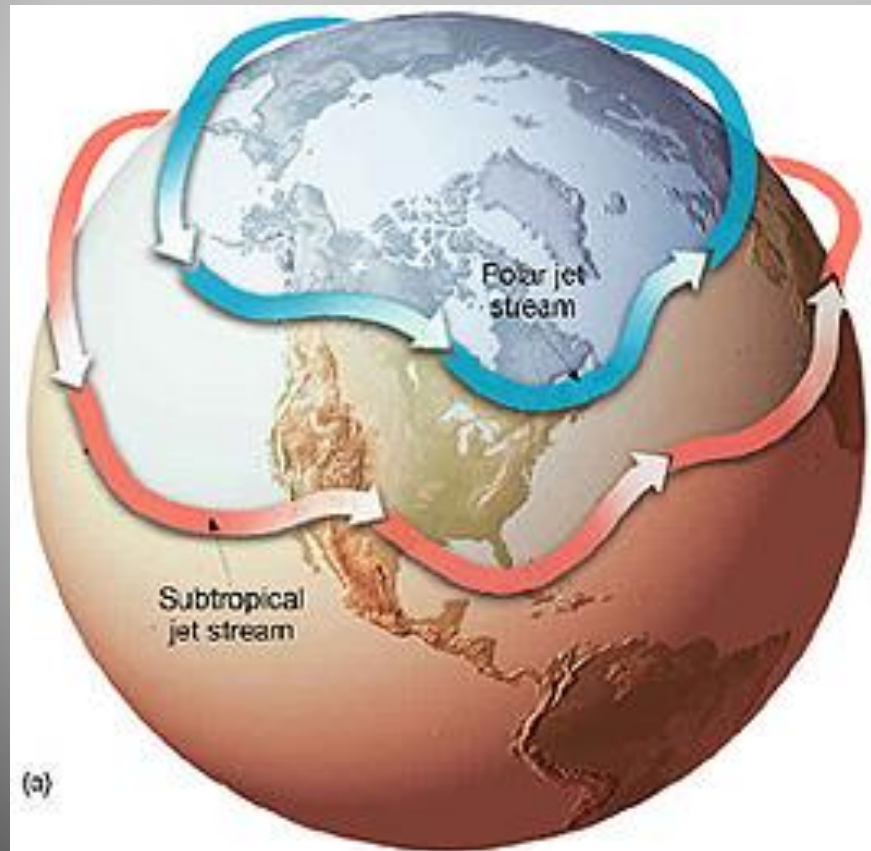
- Polar easterlies: winds that blow from east to west between 60° and 90° latitude in both hemispheres.
- Westerlies: winds that blow from west to east between 30° and 60° (middle latitudes) in both Hemispheres.
- Trade winds: winds that blow from east to west between 30° and the equator in both Hemispheres.

Major Wind Belts



22. Summarize the importance of the jet streams.

- They are important because they can affect the paths of storms and airline routes.



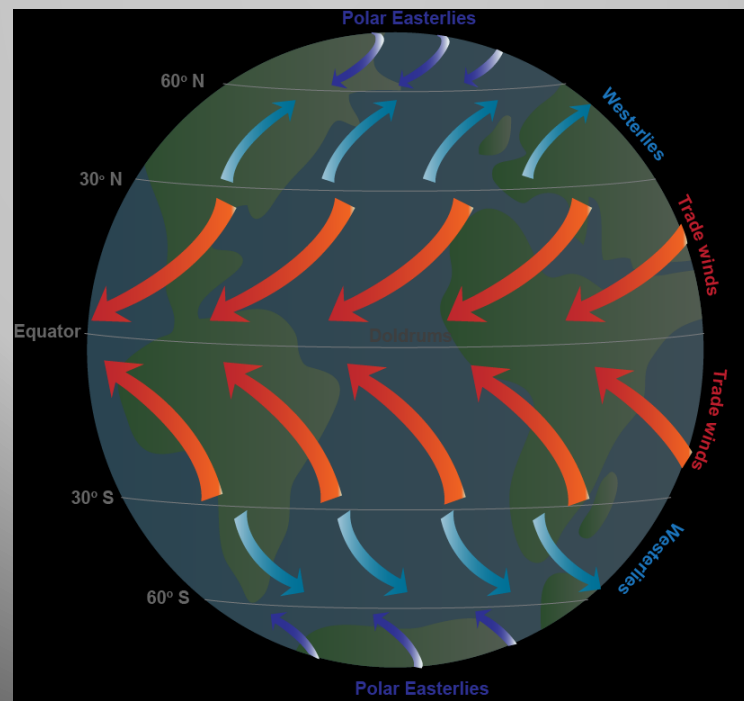
23. Identify two factors that create local wind patterns.

- Temperature differences between land and sea and between mountains and valleys influence local wind patterns



24. Determine whether wind moving south from the equator will curve eastward or westward because of the Coriolis Effect.

- Wind moving southward from the equator will curve to the east because of the Coriolis effect.



The End!!!

