

Climates of the Earth



Factors Affecting Climate

- Discuss how latitude and elevation affect climate. ↓
- Describe the role wind patterns and ocean currents play in Earth's climates. ↓
- Explain how landforms and climate patterns influence each other.

Latitude and Climate

- **Low Latitudes** The **low latitudes** are between the Tropic of Cancer and the Tropic of Capricorn. Portions of the low latitudes receive direct sunlight year-round. ↓
- **High Latitudes** The **high latitudes** are the polar areas. They receive continuous but indirect sunlight for six months each year, and the climate is always cold.

Latitude and Climate

- **Mid-Latitudes** The **mid-latitudes** are the zones between the Tropics and the polar areas. They have a temperate climate ranging from fairly hot to fairly cold, with dramatic seasonal changes.

Elevation and Climate

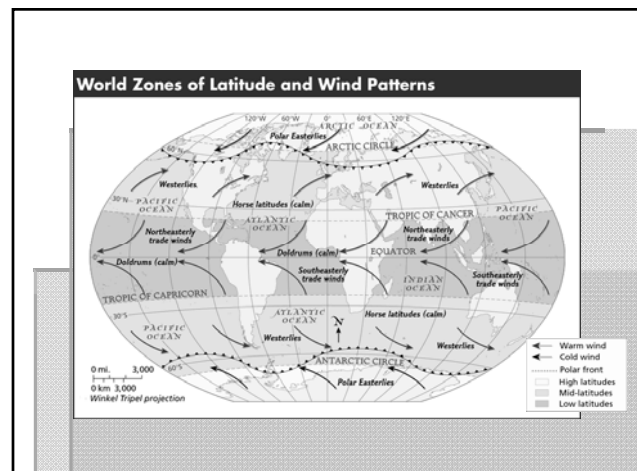
- The higher the altitude of a place, the colder its climate will be. ↓
- At high altitudes, the air is thinner and retains less heat.

Wind and Ocean Currents

- **Wind Patterns** **Prevailing winds**, global winds that blow in fairly constant patterns, are affected by the direction of the earth's rotation and latitude. ↓
- The trade winds of the tropics blow diagonally toward the Equator. ↓
- The westerlies of the mid-latitudes blow diagonally from west to east. ↓
- The polar easterlies of the high latitudes blow diagonally from east to west.

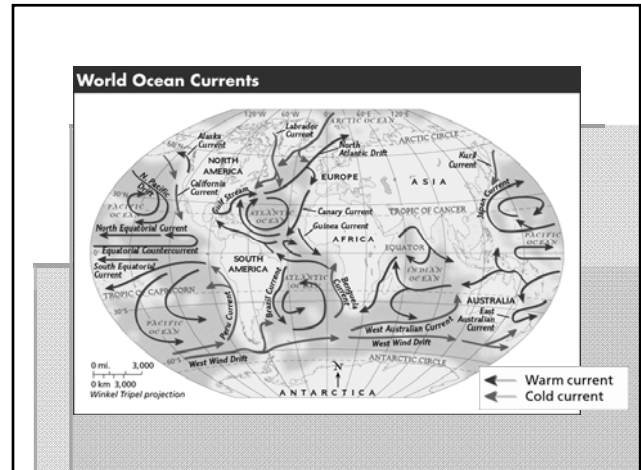
Wind and Ocean Currents

- **The Horse Latitudes** At the Equator is a narrow, generally windless band called the **doldrums**. ↓
- Just north and south of the Tropics are other narrow bands of calm air. ↓
- In the past, wind-powered sailing ships were in danger if they were stranded in these windless areas. ↓
- To lighten their vessels in order to take advantage of any breeze, livestock were thrown overboard, which accounts for the name horse latitudes.



Wind and Ocean Currents

- **Ocean Currents** Ocean **currents** move warm and cold water just as winds move warm and cold air. ↓
- **Weather and the Water Cycle** A drop in temperature causes the water vapor in the atmosphere to form clouds and eventually to condense and fall as rain or snow.

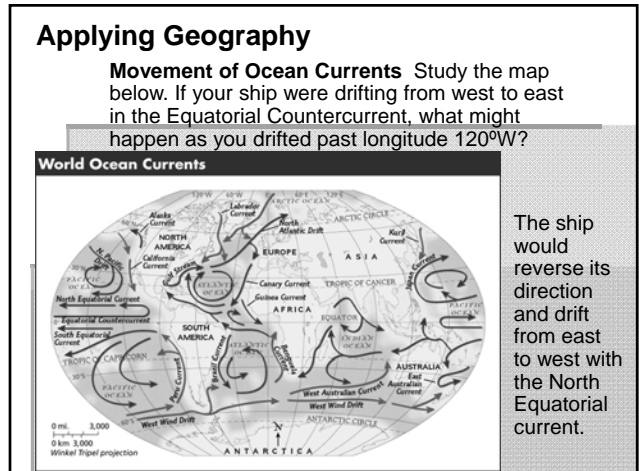
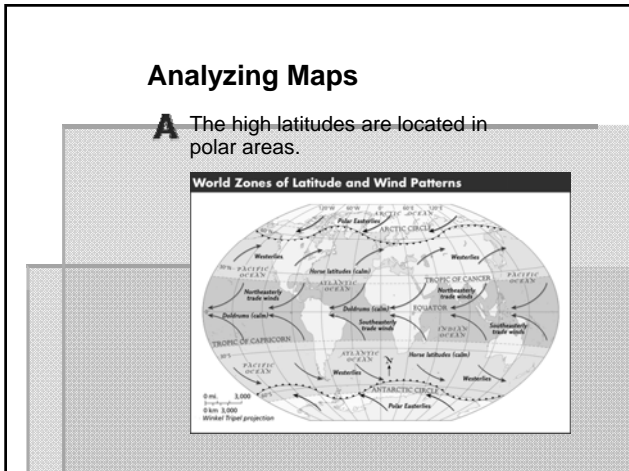
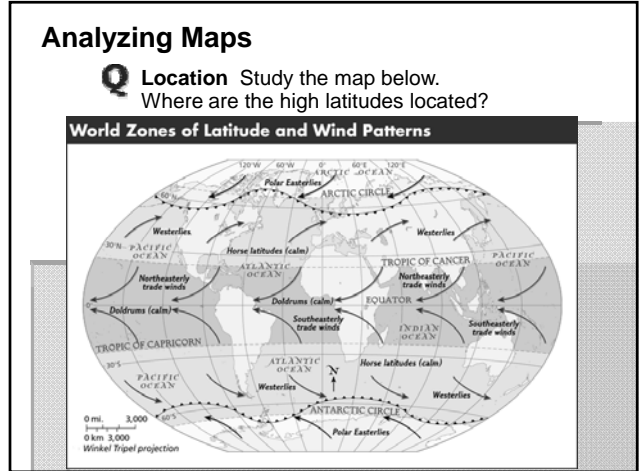
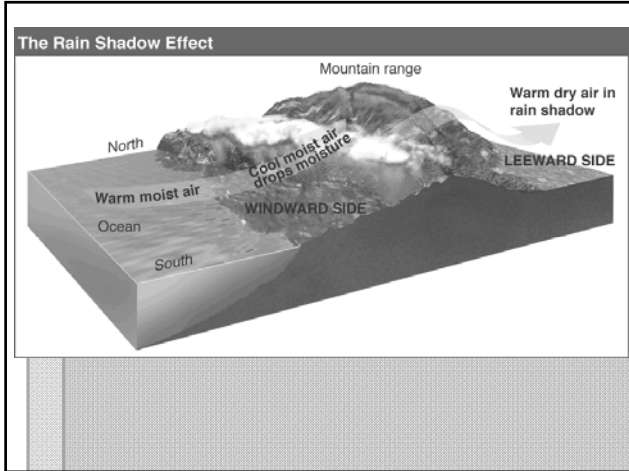


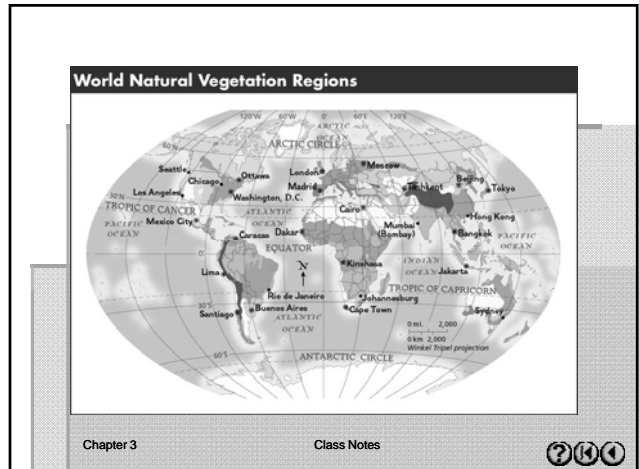
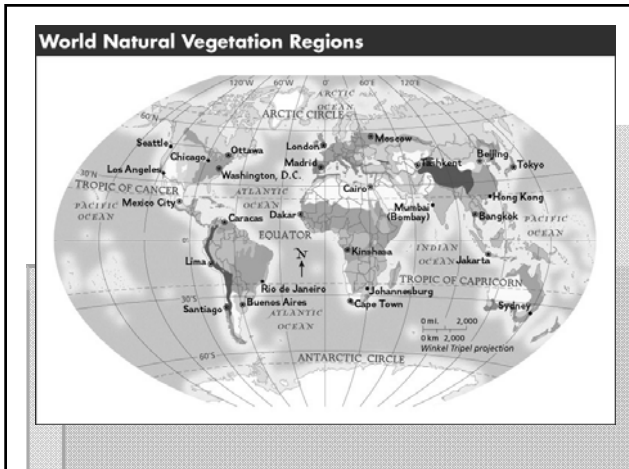
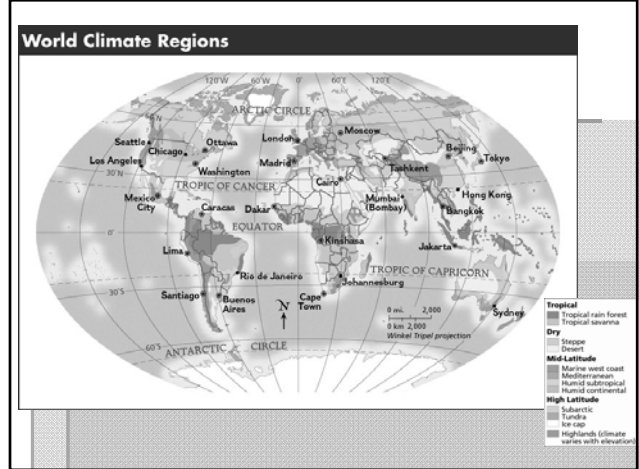
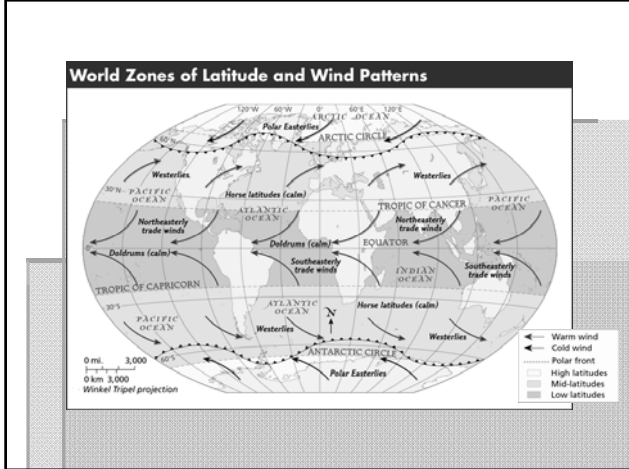
Landforms and Climate

- Earth's surface features, such as mountains and bodies of water, can affect and be affected by climate. ↓
- Large bodies of water are slower to heat and cool than land, so bodies of water tend to moderate coastal land temperatures. ↓
- When wind meets a mountain range, it is forced upward.

Landforms and Climate

- This rising air cools and brings precipitation to the **windward** side (the side facing the wind) of the range. ↓
- After the rain falls on the windward side, the air is warmer and drier as it descends on the **leeward** side (the side facing away from the wind) of the mountain range. ↓
- Areas on the leeward sides of mountains receive little precipitation and are often very dry because of this **rain shadow** effect.





Chapter 3

Class Notes



Daily Focus Skills 3-1
Drawing Conclusions

Standardized Test Practice

Hours of sunlight in selected cities on June 21, the Summer Solstice in the Northern Hemisphere

LOCATION	LATITUDE	APPROXIMATE DAYLIGHT HOURS
Quito, Ecuador	0° N	12 hours
Guantanamo, Cuba	20° N	13 hours
Cairo, Egypt	30° N	14 hours
Beijing, China	40° N	15 hours
Prague, Czech Republic	50° N	17 hours
Ft. Yukon, AK, United States	67° N	24 hours

How many hours of daylight do you think there will be in Hammerfest, Norway, latitude 71° N, on June 21?

A 24 hours C 25 hours
B 12 hours D 0 hours

Source: National Geographic Atlas of the World, 7th Edition, November 2000.

Daily Focus Skills 3-2
Interpreting a Diagram

Standardized Test Practice

Elevation and Temperature

Quito, Ecuador
Avg. Temp. 56° F (13° C)
Elevation 9,226 feet (2814 m)

Kampala, Uganda
Avg. Temp. 70° F (21° C)
Elevation 3,753 feet (1145 m)

Belém, Brazil
Avg. Temp. 79° F (26° C)
Elevation 78 feet (24 m)

Singapore
Avg. Temp. 81° F (27° C)
Elevation 104 feet (32 m)

What does the diagram indicate about the relationship between elevation and temperature at the same latitude?

A Average temperature decreases as elevation increases. C Elevations are always similar at the same latitude.
B Elevation does not affect temperature. D Latitude determines elevation.

Click the mouse button or press the space bar to display the answer.

Source: www.natgeo.com/interactive/earth/

