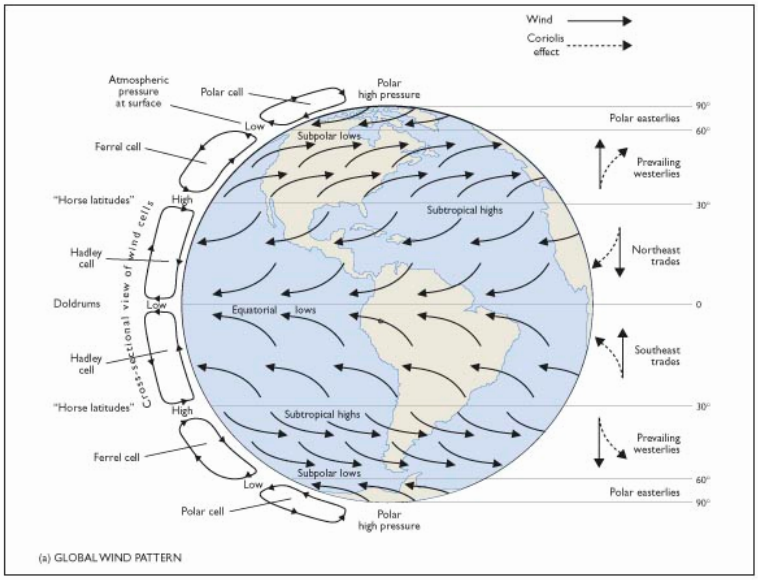
Surface Ocean Circulation

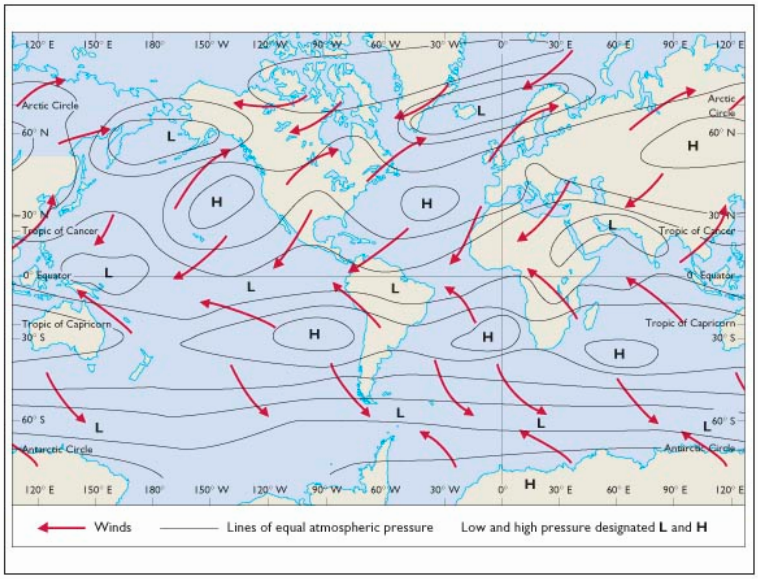
Unequal heating of the Earth's surface and the Coriolis deflection cause a zonal wind system to develop, arranged in three circulation cells.

Figure 6.3a



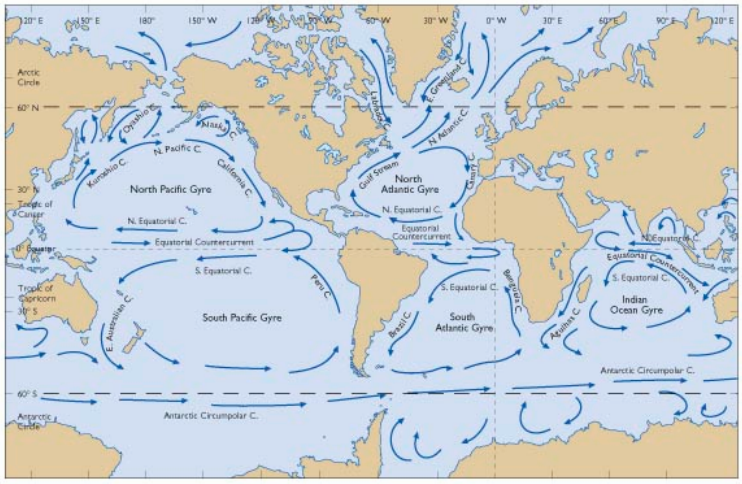
The plotting of prevailing winds on an air-pressure map of the world reveals that winds flow from high-pressure zones to low-pressure zones at an angle to the regional pressure

Figure 6.3b



Surface ocean currents.

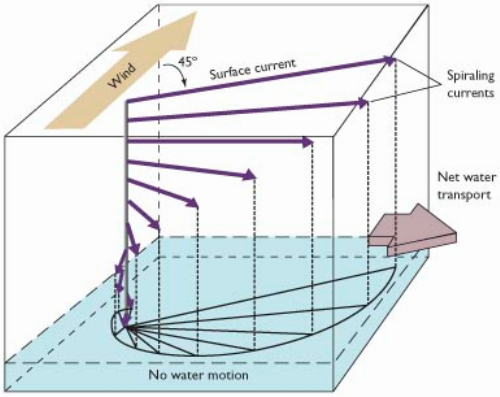
Figure 6.4



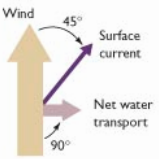
(b) GLOBAL SURFACE-WATER CURRENT PATTERN

Ekman transport.

Figure 6.6



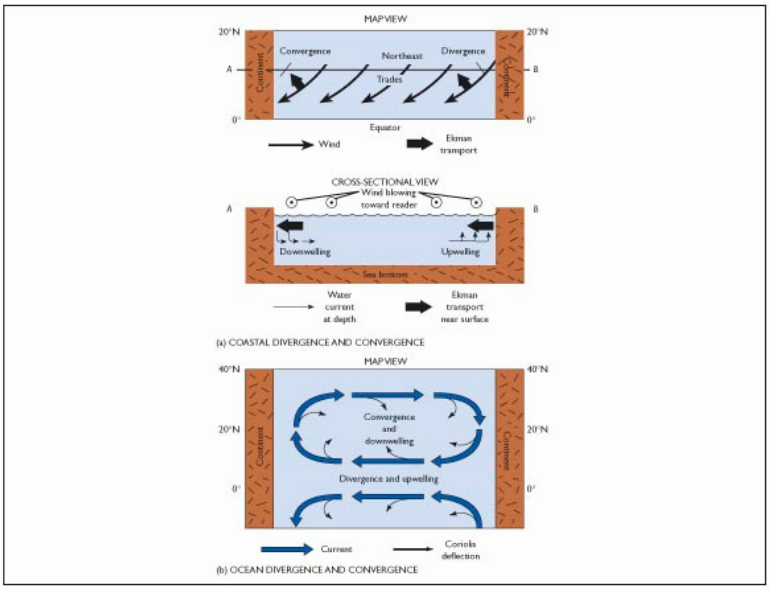
(a) EKMAN SPIRAL IN THE NORTHERN HEMISPHERE



(b) MAP VIEW

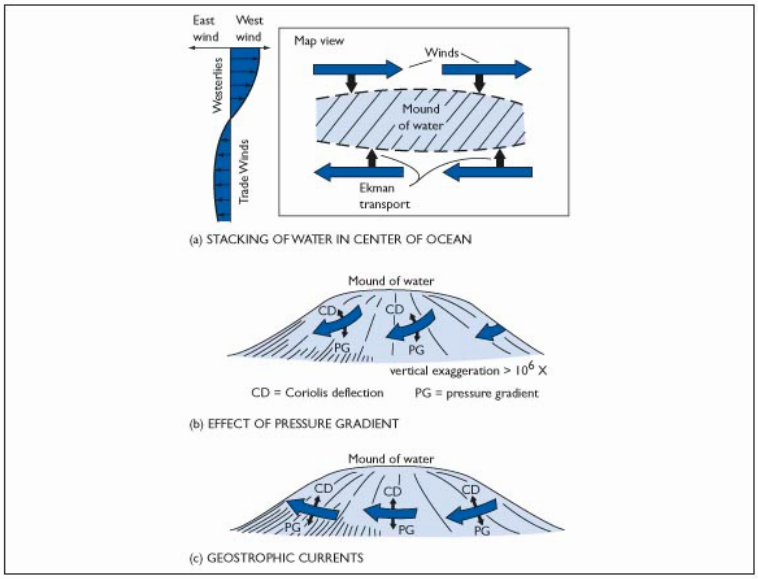
Convergence and divergence of water currents in the Northern Hemisphere.

Figure 6.7



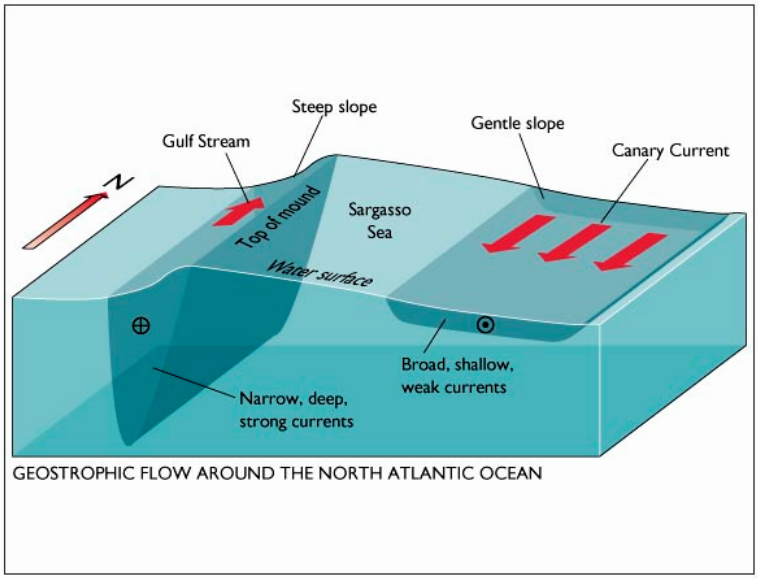
Geostrophic currents.

Figure 6.9



Flow asymmetry around circulation gyres.

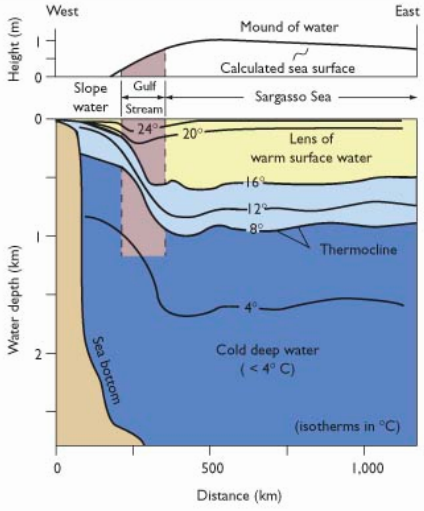
Figure 6.10



GEOSTROPHIC FLOW AROUND THE NORTH ATLANTIC OCEAN

Isotherms indicate that the Sargasso Sea consists of warm water that is separated from the cold slope water off North America by the northerly flowing Gulf Stream.

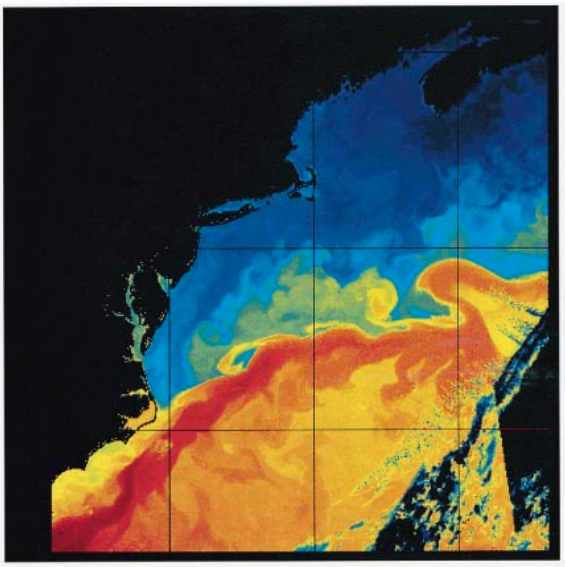
Figure 6.11c



(c) TEMPERATURE SECTION ACROSS THE WESTERN SARGASSO SEA

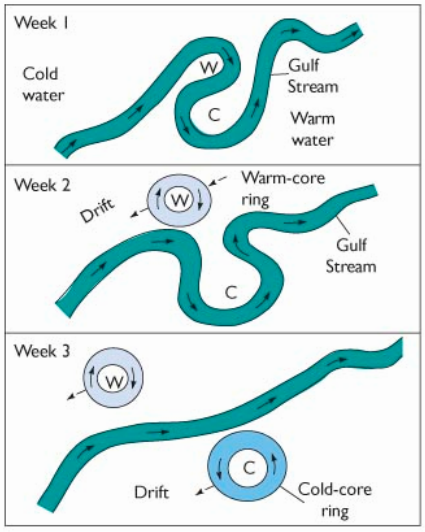
This infrared satellite photograph reveals the wavy flow path of the Gulf Stream.

Figure 6.12a



Often meander loops of the Gulf Stream become so coiled that meanders are cut off.

Figure 6.12b

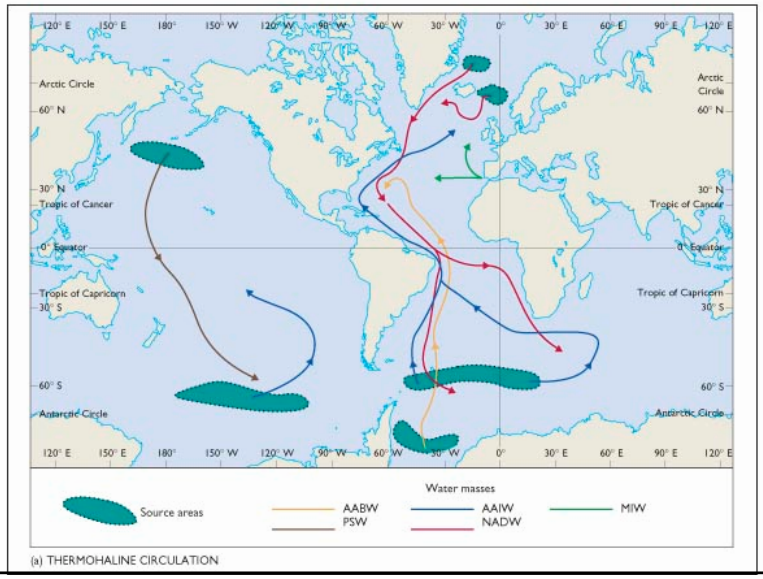


(b) FORMATION OF RINGS

Deep Water Flow and Thermohaline Circulation

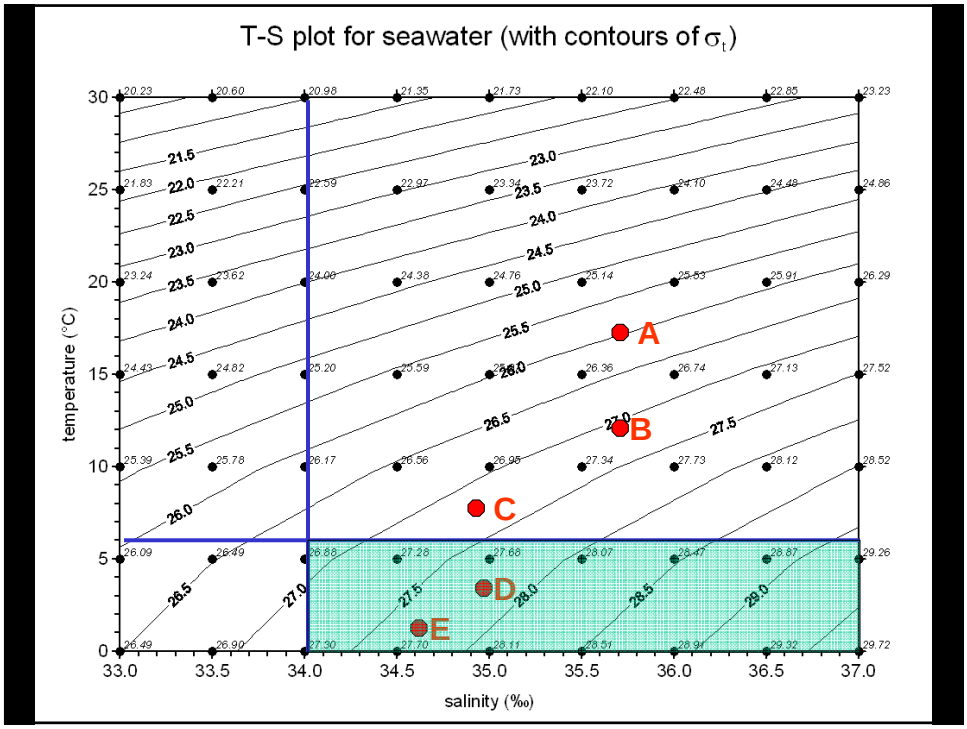
This map depicts the flow paths of some deep-water masses.

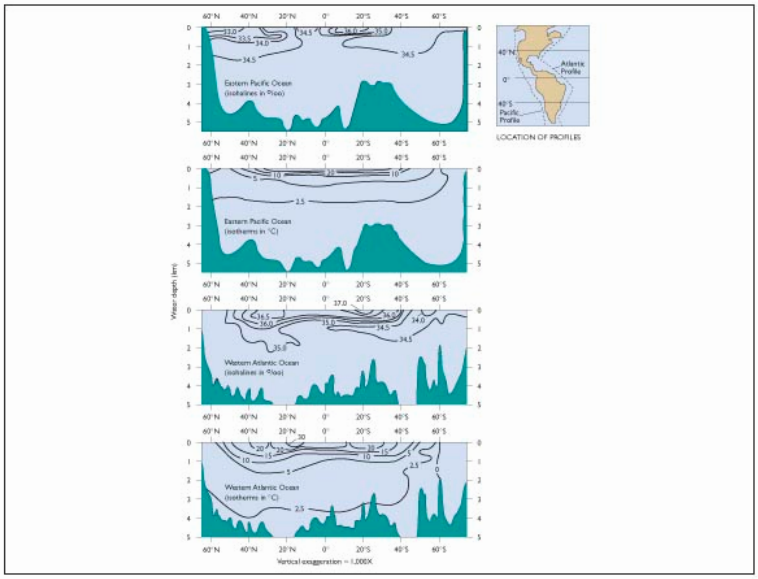
Figure 6.16a



(a) THERMOHALINE CIRCULATION

Deep Water Formation GIS Exercise



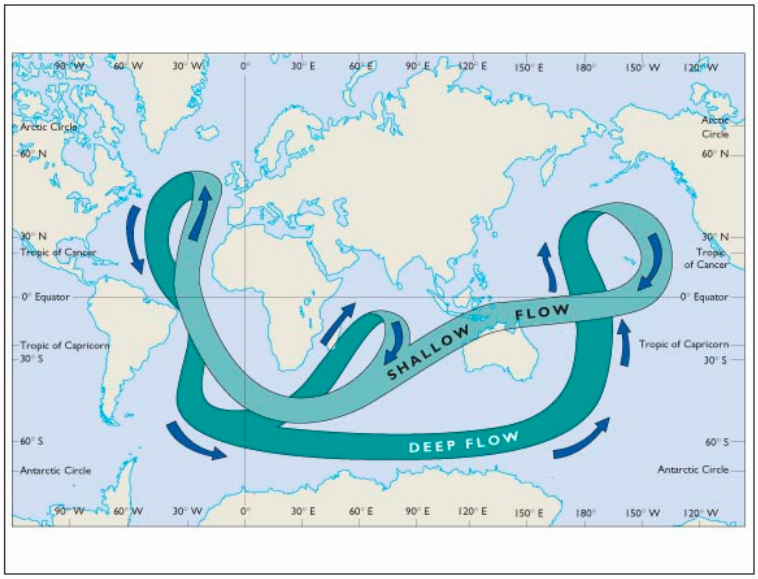


Temperature and salinity profiles.

Figure 6.14

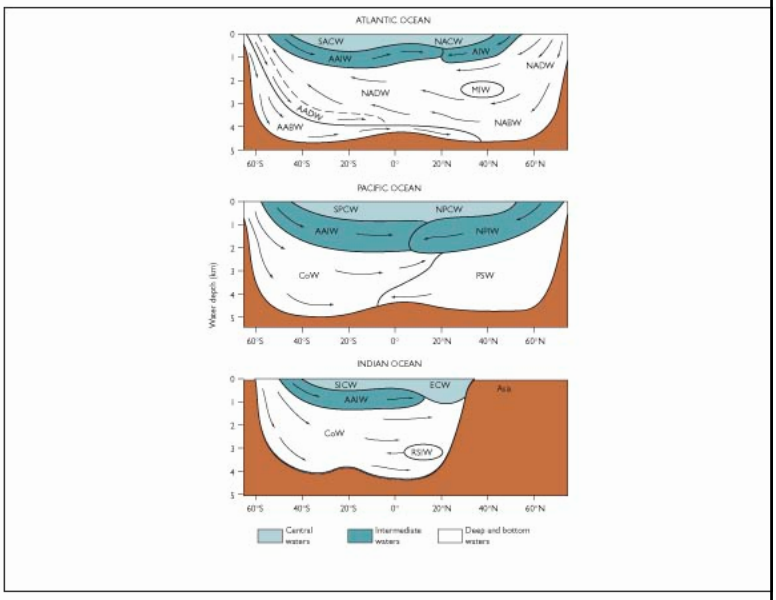
This model portrays the exchange of surface and deep water across the ocean basins as a conveyor belt.

Figure 6.16b



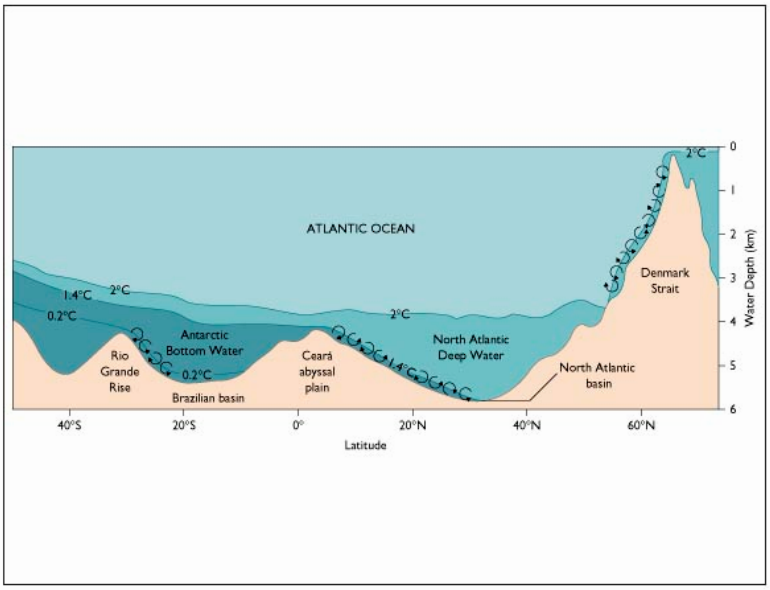
Water-mass structure in the oceans.

Figure 6.15



Underwater waterfalls.

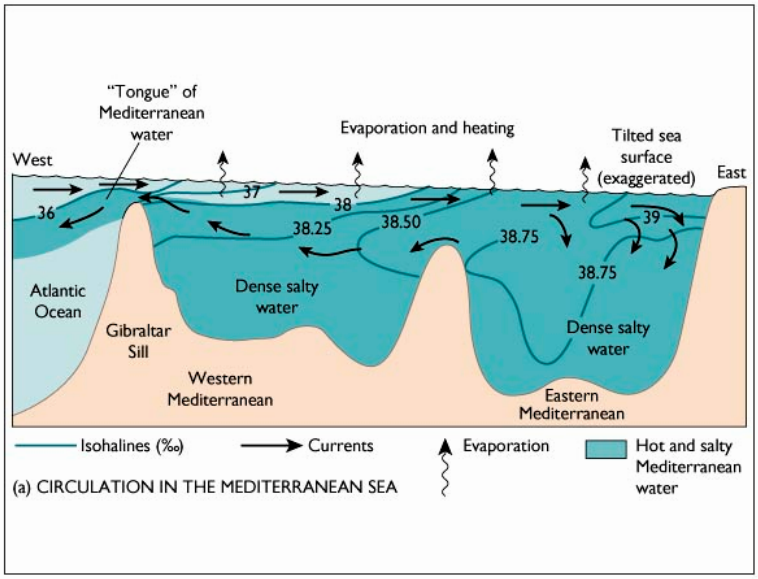
Figure 6.B6-7



Circulation and Mediterranean Sea demo

Surface and subsurface circulation in the Mediterranean Sea occurs because evaporation exceeds precipitation and river runoff combined.

Figure 6.17a



Salinity-temperature variations at depth in the North Atlantic.

Figure 6.B6-8