

## Water's Special Properties

Property	Significance
Present in all three physical states – solid, liquid, and gas – at ambient temperatures on the Earth's surface.	<ul style="list-style-type: none"> <li>● Water vapor evaporating from the sea surface helps transport heat from warm, low latitudes to cool, high latitudes.</li> <li>● The presence of ice and water in polar regions moderates climates in those regions.</li> <li>● Ice formation in polar waters during winter produces hypersaline seawater that sinks, delivering oxygen to the deep ocean.</li> </ul>
A higher heat capacity than any common solid or liquid other than ammonia.	<ul style="list-style-type: none"> <li>● Large amounts of heat energy are transported in ocean currents traveling from low to high latitudes. This cools tropical regions, warms polar regions and thus moderates the Earth's climate.</li> <li>● Water warms up and cools down more slowly than land and air, and so ocean water has a moderating influence on coastal regions.</li> <li>● Over much of the world's ocean, surface temperatures fluctuate less than 3.6°F (2°C) in a 24-hour period. In contrast, surface temperatures on landmasses may fluctuate by 27°F (15°C).</li> <li>● Water provides a thermally stable environment for marine organisms.</li> </ul>
A higher latent heat of fusion than that of any substance other than ammonia.	<ul style="list-style-type: none"> <li>● When ice forms or melts a large amount of heat is released or is absorbed. At high latitudes, ice formation and melting acts as a thermostat, keeping water and atmosphere at temperatures around the freezing point of water (28.7°F or -1.8°C).</li> </ul>
A higher latent heat of vaporization than that of any other common substance.	<ul style="list-style-type: none"> <li>● Heat energy is absorbed from the ocean when evaporation takes place at low latitudes. The heat energy is released when water vapor condenses and falls as precipitation at high latitudes. This effect helps moderate global climate which otherwise would be much more extreme at the poles and equator.</li> </ul>
The thermal expansion properties of pure water are unusual in that water's maximum density is at 39.2°F (4°C), not at its freezing point 32°F (0°C).	<ul style="list-style-type: none"> <li>● Ice floats. Lakes and shallow seas do not normally freeze solid. Instead a surface layer of ice floats above the cold but unfrozen water where organisms continue to survive.</li> </ul>
Water has uniquely powerful solvent properties. Water dissolves more substances than any other common liquid.	<ul style="list-style-type: none"> <li>● Water is the medium in which life-supporting chemical reactions occur.</li> <li>● Water dissolves minerals from rocks and soil and carries them to the oceans.</li> </ul>
Water's surface tension is higher than that of any other liquid.	<ul style="list-style-type: none"> <li>● Encourages bubble formation below the water surface and droplet formation above it. Both effects enhance the exchange of gases between the oceans and atmosphere.</li> <li>● Surface tension enables some small organisms to anchor in or under the water surface or, in the case of some animals, walk upon it.</li> </ul>